Academic Program Review

Computer Science

Graduate Program

Self-Study Report

Academic Years 2012-2017

Table of Contents

Preface and History

The last review of the Computer Science graduate program at the University of Tennessee at Chattanooga (UTC) was in 2013 (self-study written in 2012). The most significant concern from the previous program review related to the size of the graduate student body (28 students in fall semester of 2012, with an enrollment hovering between 20 and 30 students for the preceding 10 years). The program reviewer noted the strong demand for CS and IT professionals in the Chattanooga area as a potential factor in growing the size of the program. The reviewer mentioned several approaches taken by the department to try to increase graduate enrollment and concluded, "It is strongly recommended that the department continues these efforts." We are pleased to report that over the succeeding five-year period, the program has in fact experienced significant growth, increasing steadily in size from 34 students in fall 2013 to 59 students in fall 2017. A significant portion of the enrollment growth resulted from an increase in gender diversity: the fall 2013 graduate student body included only five women, but by the fall of 2017, the department had 18 female graduate students.

The 2013 program review also included one concern about the curriculum: the fact that "most 5000-level graduate courses are offered concurrently with 4000-level courses." The reviewer expressed the concern that the lack of graduate-only courses "may prohibit graduate students from immersing in a peer-only environment, which is an important component in graduate education" and noted that interviewed students voiced the same concern. Possibly related to this concern was the reviewer's suggestion that the program attempt to add "new faculty lines incrementally." During the years ensuing the visit, the recommendation to add faculty lines has been addressed; CSE now employs 13 full-time faculty (11 tenured/tenure-track positions and 2 lecturers) plus several adjuncts. However, it should be noted that not all of

these faculty are devoted full-time to teaching in the department's academic programs: one serves as department head, one as an assistant dean of the College, one as director of the UTC SimCenter, one as UTC director of Urban Technologies, and one has a joint faculty appointment with the Biology Department. Thus, the full-time faculty equivalent is only approximately 10.5.

The modest increase in faculty size vs. the significant increase in the size of the department's student body (+44% undergraduate and +74% graduate from 2013-17) has made it impossible for the department to eliminate the combined graduate/ undergraduate classes. Considering the most recent semesters at the time this self-study report was written, in spring 2017 four of the eight regular graduate courses (excluding foundation courses, individual studies, internship, project, and thesis) were offered in combination with a senior-level undergraduate course. In fall 2017, five of seven graduate courses were offered in combination with a 4000-level course. The department is aware that this is still a concern, but will need additional faculty lines (and/or relief of existing faculty from administrative duties) in order to offer more graduate-only courses in the future.

A. History of the University of Tennessee at Chattanooga

The University of Tennessee at Chattanooga is a metropolitan university located in the southeastern corner of the state of Tennessee. Chattanooga's metro area has a population of approximately 500,000 people who reside in not only Chattanooga and surrounding areas of southeast Tennessee, but also portions of north Georgia and northeastern Alabama.

The University of Tennessee at Chattanooga (UTC) became part of the University of Tennessee (UT) System in 1969. The System consists of four major campuses located in Chattanooga, Knoxville, Martin, and Memphis. Governance is provided through a UT System

President, Chancellors on each campus, and a UT Board of Trustees. The Governor of the State appoints Board members and serves as Chairman of the Board.

Prior to becoming part of the UT System, the university was a private university, known as the University of Chattanooga (UC). UC was founded by an agency of the Methodist Episcopal Church in 1886. Other institutions in the Chattanooga area, including Chattanooga City College (CCC), a predominately African-American institution, became part of the UT System merger in 1969.

At the time of the merger in 1969, UC's student population was slightly more than 2,200. Now as a public institution, UTC serves over 11,000 students. Approximately 12 percent of UTC's students are enrolled in graduate programs. Overall, UTC's students represent not only Tennessee (coming from 70 Tennessee counties), but also more than 40 states and 40 foreign countries.

B. Background of the Computer Science Graduate Program

The Master of Science (MS) degree in Computer Science at UTC is designed for students with a bachelor's degree in computer science or a closely related field; however, the program accepts students with undergraduate degrees in other fields. Students are individually evaluated for admission to the program, and applicants lacking knowledge in key areas of computing sciences and/or mathematics are assigned prerequisite courses to prepare them for the master's degree program.

The master's program in Computer Science has three concentrations – one general and two focused in specific areas of study. The general concentration is known simply as "Computer Science" and allows students maximum flexibility in choosing electives in their areas of interest.

The two specific concentrations are in Information Security and Assurance (*a.k.a.* Cyber Security) and Data Science; they provide students the opportunity to study the chosen area in more depth, but have less room for unrestricted electives. All three concentrations require 15 credit hours of Computer Science core courses, which currently may be chosen as any five courses from a list of seven (CPSC 5100, 5210, 5260, 5410, 5590, 5700, 5800). The Information Security and Assurance and Data Science concentrations have additional core and focus area/elective courses in those specific areas of study. To earn a master's degree in any of the three concentrations requires students to complete a minimum of 33 graduate credit hours including a thesis, or 36 hours including a project. The breakdown of credit hours required for each concentration is shown below in Table 1.

Table 1. Distribution of Credit Hours in M.S. Computer Science Concentrations

	Computer Science		Information Security and Assurance		Data Science	
	Project Option	Thesis Option	Project Option	Thesis Option	Project Option	Thesis Option
CS Core	15	15	15	15	15	15
Concentration Core			6	6	6	6
Focus Area Electives			6	3	6	6
CS Electives	9	9				
Unrestricted Electives	9	3	6	3	6	
Project	3		3		3	
Thesis		6		6		6
Total	36	33	36	33	36	33

Part I. Learning Outcomes

1.1. Learning Outcomes

The desired learning outcomes for graduates of the MS Computer Science program are as follows:

- **Communication:** Communicate clearly and accurately ideas and principles within the computing field and those in other fields
- **Critical Thinking:** Attain critical professional skills and the ability to make sound professional evaluations and decisions
- **Computer Science Knowledge:** Understand and apply theoretical concepts, techniques, and methodologies in various topical areas of computer science
- **Technical Writing and Speaking:** Be able to carry out thesis research or a technical project, write a professional-quality report or thesis, and present the results of the project or thesis orally to an audience of faculty and/or fellow students

1.2. Program Evaluation

The outcomes of the MS Computer Science program are regularly evaluated using rubrics developed by the department to measure students' mastery of computer science fundamentals along with critical thinking, communication, and technical writing skills.

Building on the goal to enhance student achievement, the Computer Science and Engineering Department has developed an optional graduate-level Research Methodologies course to assist graduate students, especially those who choose the thesis option, with writing and presentation.

A. Theses and Projects

The thesis or project is the application of computer science knowledge to the real world. To complete a thesis or project, students must conduct a literature review of topics

related to the thesis/project, collect and analyze the data, and draw conclusions, which culminates in the submission of the final thesis or project report. Projects are usually more application-oriented and stem from real-world situations. On the other hand, a thesis requires more theoretical work. Documentation of professional quality and an oral presentation/defense are required for both the thesis and project options. Below are the steps that graduate students must follow to complete the thesis/project:

- Identify a potential thesis/project topic of interest and discuss it with the faculty advisor;
- Write a proposal;
- Develop a schedule;
- Select committee members;
- Conduct literature review;
- Collect data;
- Analyze data;
- Write conclusions and recommendations; and
- Write the thesis or project report and present it.

For the last two years, graduate computer science students have completed a variety of theses/projects in collaboration with various faculty. Table 2 shows a selected list of theses produced over the last several years.

Table 2. Short List of Theses Completed by UTC Computer Science Students		
Student	**Thesis Title**	**Committee Chair**
1	Exploration of the effectiveness of Apple iOS devices and bluetooth low-energy nodes in the evaluation of stroke patient rehabilitation and recovery	Sartipi, Mina
2	A novel approach to protecting mobile healthcare applications in mobile cloud	Yang, Li
3	Using network clustering to predict copy number variations associated with health disparities	Yang, Li
4	Methods to obtain pedestrian distance walked via inertial measurement units	Sartipi, Mina
5	Objective real-time motion analysis using wearable devices for post stroke rehabilitation	Sartipi, Mina
6	An exploratory study of high performance graphics application programming interfaces	Liang, Yu
7	Data driven modeling and simulation about carp aggregation	Liang, Yu
8	Cluster-based trust proliferation and energy efficient data collection in unattended wireless sensor networks with mobile sinks	Kandah, Farah
9	Identifying users on social networking using pattern recognition in messages	Kandah, Farah
10	MSTROKE: Methods of Fall Detection and Data Storage	Sartipi, Mina

B. Assessment and Follow up actions

The performance of graduate students is assessed using student evaluations given during each semester. These evaluations' results are reviewed at the departmental level to make corrective actions, if necessary. In addition, each course has a folder, saved electronically, in which faculty place course materials, students' artifacts, etc. Students' learning performance is assessed based on the three learning outcomes, from section 1.1, as follows:

- **Communication:** The College of Engineering and Computer Science provides thesis workshops throughout the semester to prepare students for their final capstone/thesis presentations. The thesis oral communication assessment rubric for graduate students evaluates organization, content, presentation length, visual aids, attention to audience and speaking skills. The written communication assessment rubric for graduate students evaluates drafting, editing, revision, final draft, and timing. These rubrics are shown in Appendix I. The minimum requirement for the program is to have a 75% average performance for all three criteria. The latest assessment conducted in 2015 shows, all students meet the minimum requirement for this criteria and no follow up action is necessary.

- **Technical Writing:** The latest assessment shows that students do a good job in technical writing, as evaluated using theses and projects. However, more assistance is needed for international students. To address this shortcoming, we have developed a research methodologies course that can optionally be taken by students to improve their technical writing skills.

1.3. Use of Evaluation Information

The College of Engineering and Computer Science has a Graduate Curriculum Committee with representation from each department, which reviews and makes necessary changes in the graduate curriculum every year based on student evaluations and assessment results (Section 1.2, B), as shown in Figure 1 below.

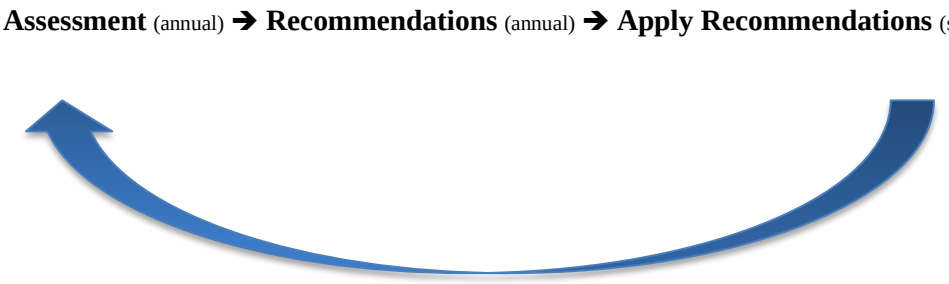

Figure 1. MS Computer Science

1.4 Institution's Mission

The MS Computer Science program is designed to align directly with the UTC and College of Engineering and Computer Science's mission, vision, and values, as shown in Table 3.

Table 3. Alignment of Mission, Vision, and Values		
	UTC	**College of Engineering and Computer Science**
Mission	The University of Tennessee at Chattanooga is a driving force for achieving excellence by actively engaging students, faculty and staff; embracing diversity and inclusion; inspiring positive change; and enriching and sustaining our community. At UTC… we develop a community on campus…enable students to go into the global community and achieve… provide a nurturing environment that connects students, community and opportunity.	1) Educate and train future technical & engineering management workforce for Tennessee, the nation, and beyond. 2) Discover new knowledge in engineering, management, technology, and computer science. 3) Engage communities through scholarship, service and economic development.
Vision	We Engage Students, Inspire Change and Enrich Community. We nurture students through community connections… tied to our values and our region… grounded in Chattanooga… a great drawing card… we value our place.	To be a preeminent college of engineering, engineering management, technology, and computer science in education and applied research.
Core Values/ Goals	• Students are the primary reason we exist as an institution. • We live integrity, civility and honesty. • We relentlessly pursue excellence. • We embrace diversity and inclusion. • Creativity, inquiry and scholarship are our culture. • We teach… we learn… we interact… we nurture… we grow citizens for tomorrow… we do the basics and more.	• Enrich Student Experience • Cultivate excellence in teaching and learning • Enhance applied research capabilities of the college for broader impact to the society • Engage community through scholarship and service with leadership and distinction • Enhance national/international reputation and recognition

Part II. Curriculum

2.1. Curriculum Review

The MS Computer Science curriculum has been revised multiple times in the last five years to appropriately address the needs of current students and attract new students. Specifically:

1) A new concentration, Data Science, has been added;
2) Several graduate courses are now available online; and
3) New graduate courses have been added to enhance student learning and preparation for the real world.

A new Data Science concentration was launched in the fall of 2016 in response to the regional demand for data scientists. The curriculum is designed to provide students with the knowledge and skills necessary to function effectively as data scientists. To increase the flexibility of the MS Computer Science program, some of the courses in the curriculum are offered online.

2.2. Course Scheduling and Offerings

The curriculum has been designed to be flexible and convenient with courses offered regularly, enabling students to make timely progress towards their degrees. Students can finish their master's degrees in computer science in two years by taking three courses per semester. It may be possible to finish more quickly by taking an additional fall or spring course, or by taking a summer course(s), subject to availability. At least two Computer Science core courses, one ISA course, and one Data Science course, plus multiple elective courses, are offered each fall and spring semester, in addition to the Thesis and Project courses. Graduate Internship is offered

on demand. Table 4 shows the courses that have been offered in the past two years and the enrollment in each.

Table 4. Graduate Computer Science Courses Offered in the Last Two Years.

Course Enrollment* offered in Past Two Years								
COURSE INFORMATION			ACADEMIC YEAR 2015-2016			ACADEMIC YEAR 2016-2017		
NO.	*TITLE*	*CREDIT HOURS*	*SUMMER*	*FALL*	*SPRING*	*SUMMER*	*FALL*	*SPRING*
5000	Fund. of Computer Science	3		12			14	
5010	Structuring Progs & Data	3			14			13
5020	Computing Systems	3			11			15
5100	Theory of Computer Prog Lang	3		12			19	
5110	Mobile Computing	3	8			7		
5130	Intro to Cloud Computing	3			3			5
5200	Automata, Complex & Computability	3		1			2	
5210	Design & Anal. of Comp. Algorithms	3		12			21	
5220	Advanced Database Systems	3			11			
5240	Principles of Data Analytics	3						23
5260	Computer Network Security	3						7
5440	Intro to Machine Learn	3					6	
5460	Pattern Recognition	3			2			
5530	Data Visualization & Exploration	3		15				
5550	Client-Server Systems	3		14				
5600	Adv. Biometrics & Cryptography	3			3			
5660	Sys Vulnerability Anal & Audit	3		2			3	
5670	Database Security & Auditing	3		9			6	
5680	Computer Forensics	3	11				4	
5700	Advanced Computer Architecture	3			26			10
5800	Adv. Topics in System Software	3			14			17
5900	Project	3	1	4	6	1	3	5
5910R	Special Topics: Wireless Security	3						2
5920R	Grad. Internship in Computer Sci.	1	1	0	1	3	4	2
5997R	Individual Studies	3	1	1	3	0	2	1
5999R	Thesis	1-6	2	5	4	1	3	2
7999R	Dissertation	3						3

2.3. Comparison with Similar Undergraduate Courses

The MS Computer Science program curriculum includes academic content that builds off the fundamentals taught in undergraduate courses. In such cases, graduate coursework delves deeper into the conceptual points of the field. Students are encouraged to spend time on key derivations rather than focusing solely on outcomes as a way of illustrating methods they will find useful. The syllabi for two graduate courses CPSC 5700 – Advanced Computer Architecture

and CPSC 5590 – Advanced Computer Networks and their respective undergraduate courses CPSC 4700 – Computer Architecture and CPSC 4550 – Computer Networks are provided in Appendices H and G, respectively, as examples.

2.4. Alignment with Learning Outcomes

The MS Computer Science program has clear learning outcomes related to communication skills, critical thinking, computer science knowledge, and technical writing and speaking skills that graduate students must master to successfully complete the program. The outcomes are aligned with the MS Computer Science curriculum as shown in Figure 2.

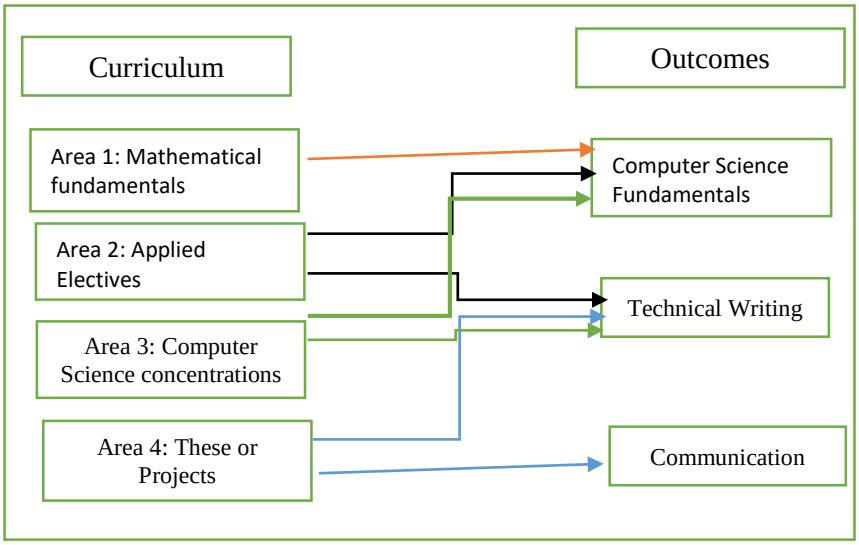

Figure 2. MS Computer Science Curriculum Alignment with Program Outcomes

2.5. Curriculum Structure

A. Computer Science Program Curricula Samples

Below are examples of the graduate program curricula for the three Computer Science

concentrations. Additional details, as well as course descriptions, can be found in the Graduate Catalog at http://catalog.utc.edu/content.php?catoid=22&navoid=761.

Computer Science: Computer Science, M.S.

Computer Science Core Courses

15 hours; choose 5 of the 7 courses shown

- CPSC 5100 - Theory of Computer Programming Languages
- CPSC 5210 - Design and Analysis of Computer Algorithms
- CPSC 5260 - Introduction to Parallel Algorithms
- CPSC 5410 - Model Analysis and Simulation
- CPSC 5590 - Advanced Computer Networks
- CPSC 5700 - Advanced Computer Architecture
- CPSC 5800 - Advanced Topics in Systems Software
- Total: 15 hours

Computer Science Elective Courses

- CPSC 5110 - Mobile Computing
- CPSC 5120 - Software Project Management
- CPSC 5130 - Cloud Computing
- CPSC 5140 - Design of Distributed Systems
- CPSC 5150 - Design of Web Interfaces
- CPSC 5160 - Structured Data Exchange
- CPSC 5170 - User Interface Development
- CPSC 5200 - Automata, Complexity, and Computability
- CPSC 5230 - Decision Support and Business Intelligence
- CPSC 5240 - Principles of Data Analytics
- CPSC 5270 - Advanced Database and Database Security
- CPSC 5400 - Topics in Simulation
- CPSC 5410 - Model Analysis and Simulation
- CPSC 5420 - Programming with SAS
- CPSC 5440 - Introduction to Machine Learning
- CPSC 5450 - Advanced Topics in Artificial Intelligence
- CPSC 5460 - Pattern Recognition
- CPSC 5500 - Computer Graphics Applications and Algorithms
- CPSC 5510 - Advanced Computer Graphics
- CPSC 5530 - Data Visualization and Exploration
- CPSC 5560 - Computer Data Communications
- CPSC 5570 - Internetworking
- CPSC 5600 - Advanced Biometrics and Cryptography
- CPSC 5610 - Advanced Information Security Management

- CPSC 5620 - Computer Network Security
- CPSC 5640 - Internet Security Protocols
- CPSC 5660 - System Vulnerability Analysis and Auditing
- CPSC 5680 - Computer Forensics
- CPSC 5710 - Microcomputer Systems Architecture
- CPSC 5720 - Real-Time Embedded Systems
- CPSC 5820 - Legacy Computing Systems
- CPSC 5850 - Compiler System Design
- CPSC 5910r - Special Topics
- CPSC 5920r - Graduate Internship in Computer Science
- CPSC 5997r - Individual Studies
- Total 9 hours

Project or Thesis

- CPSC 5900 - Project **(3 hours)**
- or
- CPSC 5999r - Thesis **(6 hours)**

Computer Science: Data Science, M.S.

Computer Science Core Courses

15 hours; choose 5 of 7 courses shown

- CPSC 5100 - Theory of Computer Programming Languages
- CPSC 5210 - Design and Analysis of Computer Algorithms
- CPSC 5260 - Introduction to Parallel Algorithms
- CPSC 5410 - Model Analysis and Simulation
- CPSC 5590 - Advanced Computer Networks
- CPSC 5700 - Advanced Computer Architecture
- CPSC 5800 - Advanced Topics in Systems Software

Data Science Core Courses

At least 6 hours of Data Science Core Courses

- CPSC 5180 - Programming Languages for Advanced Data
- CPSC 5240 - Principles of Data Analytics
- CPSC 5440 - Introduction to Machine Learning
- CPSC 5530 - Data Visualization and Exploration

Plus at least 6 hours chosen from one of five Data Science areas:

- **MATH AREA**
- MATH 5130 - Introduction to Probability and Statistics
- MATH 5140 - Mathematical Statistics
- MATH 5150 - Introduction to Biostatistics
- MATH 5160 - Applied Statistical Methods
- MATH 5300 - Mathematics of Interest

- **BUSINESS AREA**
- MGT 5180 - Prescriptive Analytics
- MGT 5190 - Data Mining and Analytics
- MGT 5200 - Advanced Data Analytics

- **BIOLOGY AND ENVIRONMENTAL SCIENCE AREA**
- ESC 5210 - Seminar in Environmental Ethics
- ESC 5610 - Advanced Applications of Remote Sensing and Geographic Information Systems
- ESC 5610L - Advanced Applications of Remote Sensing & Geographic Information Systems Laboratory
- ESC 5660 - Geographic Information Systems
- ESC 5660L - Geographic Information Systems Laboratory

- **ENGINEERING MANAGEMENT AREA**
- ENGM 5040 - Decision Making and Optimization Techniques
- ENGM 5520 - Reliability Engineering
- ENGM 5580 - Advanced Engineering Economy
- ENGM 5850 - Technical Innovation

- **INFORMATION SECURITY AND ASSURANCE AREA**
- CPSC 5270 - Advanced Database and Database Security
- CPSC 5600 - Advanced Biometrics and Cryptography
- CPSC 5610 - Advanced Information Security Management
- CPSC 5620 - Computer Network Security
- CPSC 5660 - System Vulnerability Analysis and Auditing
- CPSC 5680 - Computer Forensics

Unrestricted Electives

Requires 6 if the Project option is chosen

- **PROJECT OR THESIS**
- CPSC 5900 - Project **(3 hours)**
- or
- CPSC 5999r - Thesis **(6 hours)**

Computer Science: Information Security and Assurance, M.S.

Computer Science Core Courses

15 hours; choose 5 of 7 courses shown; ISA must include CPSC 5590

- CPSC 5100 - Theory of Computer Programming Languages
- CPSC 5210 - Design and Analysis of Computer Algorithms
- CPSC 5260 - Introduction to Parallel Algorithms
- CPSC 5410 - Model Analysis and Simulation
- CPSC 5590 - Advanced Computer Networks
- CPSC 5700 - Advanced Computer Architecture
- CPSC 5800 - Advanced Topics in Systems Software
- Total: 15 hours

Computer Science Elective Courses

- CPSC 5110 - Mobile Computing
- CPSC 5120 - Software Project Management
- CPSC 5130 - Cloud Computing
- CPSC 5140 - Design of Distributed Systems
- CPSC 5150 - Design of Web Interfaces
- CPSC 5160 - Structured Data Exchange
- CPSC 5170 - User Interface Development
- CPSC 5200 - Automata, Complexity, and Computability
- CPSC 5230 - Decision Support and Business Intelligence
- CPSC 5240 - Principles of Data Analytics
- CPSC 5400 - Topics in Simulation
- CPSC 5410 - Model Analysis and Simulation
- CPSC 5420 - Programming with SAS
- CPSC 5440 - Introduction to Machine Learning
- CPSC 5450 - Advanced Topics in Artificial Intelligence
- CPSC 5460 - Pattern Recognition
- CPSC 5500 - Computer Graphics Applications and Algorithms
- CPSC 5510 - Advanced Computer Graphics
- CPSC 5530 - Data Visualization and Exploration
- CPSC 5560 - Computer Data Communications
- CPSC 5570 - Internetworking
- CPSC 5710 - Microcomputer Systems Architecture
- CPSC 5720 - Real-Time Embedded Systems
- CPSC 5820 - Legacy Computing Systems
- CPSC 5850 - Compiler System Design
- CPSC 5910r - Special Topics
- CPSC 5920r - Graduate Internship in Computer Science
- CPSC 5997r - Individual Studies
- Total: 9 hours

Information Security and Assurance Core Courses*

- CPSC 5590 - Advanced Computer Networks
- CPSC 5620 - Computer Network Security
- CPSC 5680 - Computer Forensics
- Total: 9 hours for Information Security and Assurance concentration

Information Security and Assurance Elective Courses

- CPSC 5140 - Design of Distributed Systems
- CPSC 5270 - Advanced Database and Database Security
- CPSC 5600 - Advanced Biometrics and Cryptography
- CPSC 5610 - Advanced Information Security Management
- CPSC 5640 - Internet Security Protocols
- CPSC 5660 - System Vulnerability Analysis and Auditing
- Total: 0-6 hours

Project or Thesis

- CPSC 5900 - Project **(3 hours)**
- or
- CPSC 5999r - Thesis **(6 hours)**

B. Certificate Program

Computer Science has, for some time, offered (at least on paper) one Post-Baccalaureate Certificate program in Biomedical Informatics (see below for the corresponding information from the Graduate Catalog). However, this program has had no students enrolled for several years, and the department has not offered one of the required courses (CPSC 5420 Programming with SAS) over that period of time. In addition, the required course NURS 5120 Health Policy, Economics and Finance has not been offered by the School of Nursing for at least four years, and the required course NURS 5510 Health Promotion and Illness Prevention in Primary Care has been offered only infrequently. Therefore, in October of 2017 program faculty submitted a

curriculum proposal to deactivate this certificate program. The proposal has been approved by the CECS Curriculum Committee, the Graduate Curriculum Committee, and the Graduate Council, which means the certificate program will be removed from the 2018-19 Graduate Catalog and no longer offered by the department.

Biomedical Informatics Post-Baccalaureate Certificate

The Department of Computer Science, in conjunction with the School of Nursing and the Department of Mathematics, offers a Certificate in Biomedical Informatics. The program is intended to provide skilled individuals with the technical policy and vocabulary knowledge necessary to successfully convert medical-based data into information useful for members of the healthcare community. Eighteen (18) semester hours of graduate credit is required to complete the certificate program.

Admission Requirements

Students admitted to the certificate program will be required to meet admissions standards for the UTC Graduate School. In addition, they must be able or willing to acquire basic skills in statistics and programming consistent with an introductory computer programming course. Since students working toward the certificate will do so in a prescribed order, they will have the time to acquire basic programming courses for credit or could attend an on-line course.

Certificate Requirements

- NURS 5120 - Health Policy, Economics and Finance
- NURS 5510 - Health Promotion and Illness Prevention in Primary Care
- Approved Statistics Course* 3 hours
- CPSC 5420 - Programming with SAS
- CPSC 5440 - Introduction to Machine Learning
- CPSC 5950r - Design Project

Total: 18 hours

Additional Information and Notes

The courses, NURS 5120, CPSC 5420, Approved 3 Hour Graduate Statistics Course*, CPSC 5440, NURS 5510, and CPSC 5950r must be completed within six calendar years at UTC with

a B cumulative average in the courses applied to the certificate program and grades of C or better in each course.

*Sample Description of an Approved Graduate Statistics Course

An intermediate graduate statistics course suitable for students in a variety of health and science disciplines. The course will cover descriptive and inferential statistics, including parametric and non-parametric hypothesis testing methods, sample size, statistical significance and power, survival curve analysis, relative risk, and odds ratios. Data will be analyzed using SAS statistical software. Prerequisite: CPSC 5420.

Application of Credits toward M.S. Programs

Courses completed as part of the certificate will count toward a Master of Science degree in Computer Science provided that the student qualifies for admission to the Computer Science Master's degree program. Note: CPSC 5950r will count as a computer science elective and not as the final project/thesis for the M.S. degree.

2.6. Professional Practice

The MS Computer Science program engages students in professional practices and training experiences by offering a variety of seminars, local internship opportunities, and job fairs throughout the year. Students are informed of these via e-mail, bulletin boards, and e-boards. In addition, theses and projects also act as professional practice resources. Examples of these can be seen in Table 2, Section 1.2.

2.7. Online and In-Class Parity

As mentioned earlier, some Computer Science graduate courses are offered online. Students in these courses are monitored and evaluated actively through Blackboard (online software package), branded as *UTC Learn*, to ensure progress and achievements are on par with students attending graduate courses on campus. In most classes, online students are required to

participate in discussion forums regularly to fulfil their class participation goals and make sure they keep up with course material. Face-to-face and online students are given assignments and exams of equivalent difficulty.

2.8. Pedagogical Methods

Graduate courses are offered at a variety of times (mid-day, late afternoon, evening, and online) to accommodate working students as well as those who are full-time on campus. Each course uses the Blackboard system to display class materials, create discussion boards, and post assignments. This system helps students keep up with coursework if they are unable to attend class due to work or illness.

Part III. Student Experience

3.1. MS Computer Science Program Enrollment and Peer Identification

It is important for students to identify with peers during their studies as it contributes to a positive learning experience and promotes team-building skills. Peer study groups facilitate understanding of course materials and assignments. The integrated nature of UTC's MS Computer Science program is designed to create an appropriate environment for peer interaction through a variety of activities, such as group projects, computer science clubs, and professional student chapters like ACM. Within most courses, students are arranged into groups to complete assignments and projects, collaboratively. In addition, students are encouraged to join on-campus clubs, professional organization student chapters, and student bodies such as the Graduate Student Association (GSA). These activities will help students connect with peers outside their discipline.

The MS Computer Science program and its concentrations provide online-accessible education in the theory and applications of computer science and prepares students for successful careers in industry, government, and academia. The diverse nature of the concentrations help students apply tools and techniques in computing sciences through individual and team-based projects and promote life-long learning and service to the computer science profession. The program objectives are to produce graduates who:

- Function as successful professionals in computer science
- Function effectively in multidisciplinary environments
- Adapt to various environments
- Participate in further knowledge building opportunities

A. Admission Requirements

Applicants must meet the requirements below to be admitted to the MS Computer Science program at UTC:

- Hold a baccalaureate degree from a regionally accredited college or university or foreign equivalent;
- Have a minimum grade point average (GPA) of 2.7 on a 4.0 scale *or* a 3.0 in the senior year;
- Have a minimum of 213 computer-based *or* 79 internet- based TOEFL score *or* 6.0 on the IELTS for international students;
- Submit official transcripts from each institution previously attended; and
- Complete the Graduate School application form and pay a non-refundable fee.

There has been some concern on the part of faculty regarding the admission of graduate students who are not sufficiently prepared to succeed in the program. In particular, international students admitted to the program often have difficulty presenting technical information and/or writing technical papers in English. In October 2017, program faculty submitted a graduate curriculum proposal to increase the admissions requirements beyond those listed above (which are the minimum admissions requirements University-wide as set by the Graduate School). This proposal has been approved at the College level and has moved on to the Graduate Curriculum Committee. If the proposal is ultimately approved by the Graduate Council, international students (and domestic students without a previous degree in computer science or a closely related field) applying to the MS Computer Science program will need a 2.9 GPA (or 3.2 in the senior year) to be admitted. The English language requirement for international students will

also increase to 220 or above on the computer-based TOEFL (or 83 on the Internet-based TOEFL), or an IELTS score of 6.5 or higher.

B. Recruitment

Students are primarily recruited into the Computer Science master's program through the CSE department web site (https://www.utc.edu/college-engineering-computer-science/programs/computer-science-engineering/ or www.utc.edu/cse) and word-of-mouth referrals from current students and alumni. There are some limited marketing efforts via the Graduate School, including an annual graduate school admissions fair attended by representatives of the faculty. This past year one faculty from the college went to two recruitment visits one in the Middle East and another in Africa where we have started getting an increasing number of students. We also have contacts with a number of local employers, several of whom are on the department's Industrial Advisory Board; this can assist with recruiting potential students who wish to further their education while working with those organizations. Despite the paucity of organized recruiting efforts, graduate program enrollment has been increasing for several years (see the following section).

C. Enrollment

Table 5 and Figure 3 below show the MS Computer Science program enrollment data over the past five years.

Table 5. MS Computer Science Program Enrollment Data

Gender	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017
Female	5	13	14	17	18
Male	29	28	34	32	41
Total	**34**	**41**	**48**	**49**	**59**

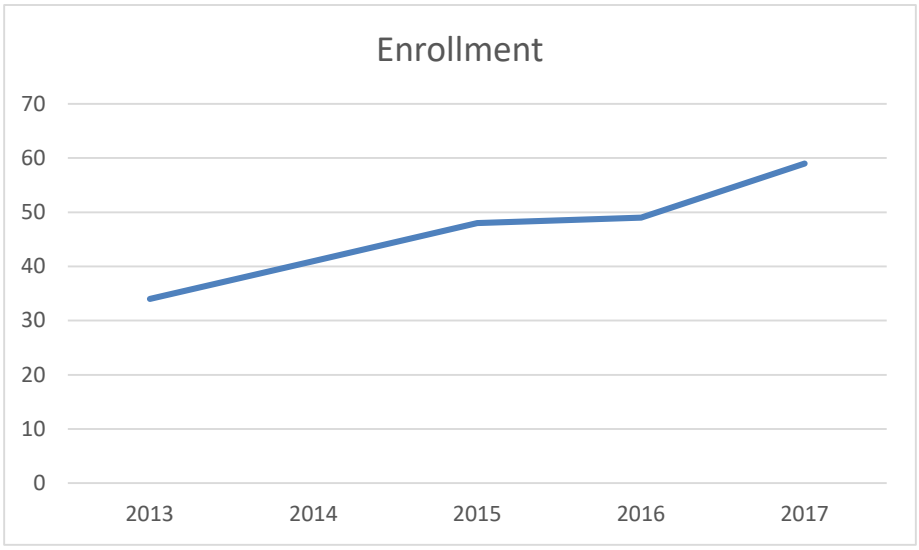

Figure 3. MS Computer Science Program Enrollment Data*
**Source: Office of Planning, Evaluation, and Institutional Research.*

D. Degrees Awarded

The number of degrees awarded in the MS Computer Science Program over the years has gradually increased, with some year-to-year fluctuation. Figure 4 shows the numbers of degrees awarded between 2013 and 2017.

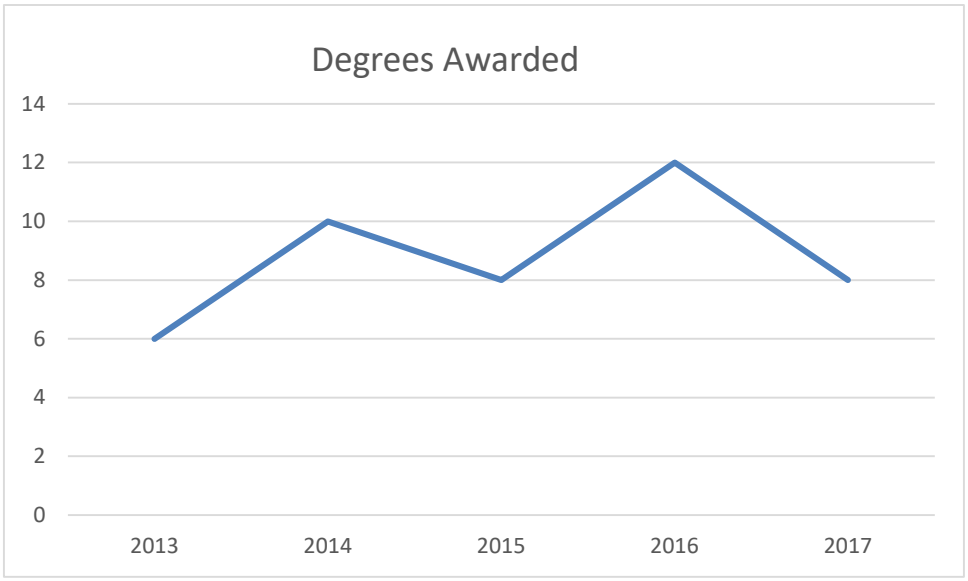

Figure 4. MS in Computer Science Degrees Awarded per Fiscal Year*
**Source: Office of Planning, Evaluation, and Institutional Research.*

3.2. Quality Evaluation

Students have the opportunity to provide feedback on the program and evaluate faculty's teaching effectiveness through surveys conducted online prior to final exams each semester. Students are routinely notified through e-mail and by the instructors in class to log on and complete the survey. As an example, student faculty ratings for fall 2016 are provided in Appendix C.

3.3. Professional Development Opportunities

The MS Computer Science program provides adequate professional development opportunities through membership in professional associations such as CompUTC, Girls in Computer Science (GiCS), the Graduate Student Association (GSA), the Society of Woman Engineers (SWE), etc. These organizations encourage students to attend conferences and workshops, help students network and find jobs, and provide students with opportunities for publication.

The Career and Student Employment Center provides free resources to assist students in finding employment opportunities in line with their qualifications. Its mission is to provide students with tools to be successful in their job search and to be prepared with the right documents for an interview. For more information, visit https://www.utc.edu/career-student-employment. Among other career development opportunities (https://www.utc.edu/college-engineering-computer-science/center-for-student-success/career-development.php), the College of Engineering and Computer Science organizes fairs twice per year, one in the fall and one in the spring, to assist students in finding jobs.

3.4. Enrichment Opportunities

To provide adequate enrichment opportunities, the MS Computer Science program hosts a variety of seminars conducted by local professional speakers from the Tennessee Valley Authority (TVA), Volkswagen (VW), Blue Cross Blue Shield of Tennessee, UNUM, Erlanger Hospital, etc. These seminars, offered free and situated conveniently in UTC auditoriums, create an environment that facilitates student engagement with local industries and enriches students' education.

3.5. Diverse Perspectives

The MS Computer Science program aims to expose students to various perspectives and experiences throughout the program. Field trips to TVA, VW, Electrical Power Board (EPB), Amazon, McKee Foods Corp., and others are held regularly to introduce students to various work environments. Guest speakers from these companies and many others are brought in to the classroom by professors every semester to impart practical knowledge and provide opportunities for discussion.

3.6. Academic Support

The availability of instructional resources has improved with the opening of the new library building in January 2015. The program's instructional equipment and facilities within the College of Engineering are adequate. Most of the classrooms have state-of-the-art technology, and a variety of laboratories in the College increase learning and research opportunities for graduate students.

Graduate students have access to a College study room on the second floor (EMCS 241), and a dedicated Computer Science study room (EMCS 311), which provide a quiet study environment. Technical support is provided by technical personnel staffed by the College of Engineering and Computer Science, along with graduate assistants.

Part IV. Faculty

4.1 Computer Science Graduate Program Coordinators

The Computer Science and Engineering Department has 11 tenured and tenure-track faculty and 2 non-tenured faculty members. All 11 tenured/tenure-track faculty members are qualified to teach graduate-level courses and advise graduate students. The expenditures on behalf of the faculty are provided in Appendix A.

The Computer Science and Engineering department has graduate program coordinators who are responsible for the graduate concentrations at each level (master's and doctoral). The main responsibilities of the graduate coordinators are to advise graduate students, review all prospective graduate students' applications, recruit graduate students to their concentrations, write and propose all graduate curriculum changes, and teach graduate-level courses. In addition, one program coordinator represents the Computer Science graduate program on the Graduate Council. The College of Engineering and Computer Science has an Associate Dean who oversees all graduate programs within the College; as Director of Graduate Programs, she meets regularly with the graduate program coordinators to discuss the curriculum as well as assistantships, recruitment, resources, and other related issues.

All full-time and part time faculty meet the high credential standards set by the program and SACSCOC guidelines. Short background information for the Computer Science program graduate coordinators is as follows:

Dr. Mina Sartipi is the coordinator of the Computer Science concentration within the Ph.D. program in Computational Sciences. Dr. Sartipi is a UC Foundation Professor in the Department of Computer Science and Engineering. She is a Program Leader for Urban Science & Technology at the University of Tennessee at Chattanooga (UTC). She also leads the Smart

Communications and Analysis Lab (SCAL). At SCAL, we leverage our expertise in data science (data analytics and data management) and wireless communications in smart city applications such as transportation, health, and energy. More specifically, SCAL focuses on research in Urban Science and Urban Analytics, Data Acquisition and Compressive Sensing, Data Integration, Data Interoperability, Big Data Analytics, Smart Health, Smart Grid, Intelligent Transportation, Information Processing for Wireless Sensor Networks, Cyber-Physical Systems (CPS), Modern Error Control Coding and Information Theory, and Signal Processing and Wavelet Transforms.

Dr. Joe Dumas is a UC Foundation Professor in the Department of Computer Science and Engineering, and is the coordinator of the MS Computer Science program. Dr. Dumas has a B.S. in Electronics Engineering Technology (with a minor in Computer Science) from the University of Southern Mississippi (1984), a M.S. in Electrical Engineering from Mississippi State University (1989), and the Ph.D. in Computer Engineering from the University of Central Florida (1993). Dr. Dumas has been on the UTC faculty since 1993, has received several teaching and service awards, and has served on a number of campus committees, including multiple terms on the Faculty Senate and Graduate Council (and is a former Chair of the GC). His areas of interest include computer architecture, microprocessor systems, embedded systems, real-time simulation, and virtual reality.

4.2. Faculty Teaching Load

Most graduate level courses, on-campus and online, are taught by full-time graduate faculty in the CSE Department. For the MS Computer Science program, faculty teaching loads are aligned with the highly individualized nature of graduate instruction. In the case of graduate

projects and theses, professors with specialized knowledge in each student's area of study are available to guide the student on an individual basis. Figure 5 shows the average Student Credit Hour (SCH) per Total Faculty FTE generated by a university faculty member, a College of Engineering and Computer Science faculty member, and the department's faculty members for each fall semester for four years starting in 2012, and Table 6 shows the average SCH production per various FTE faculty categories for each fall semester.

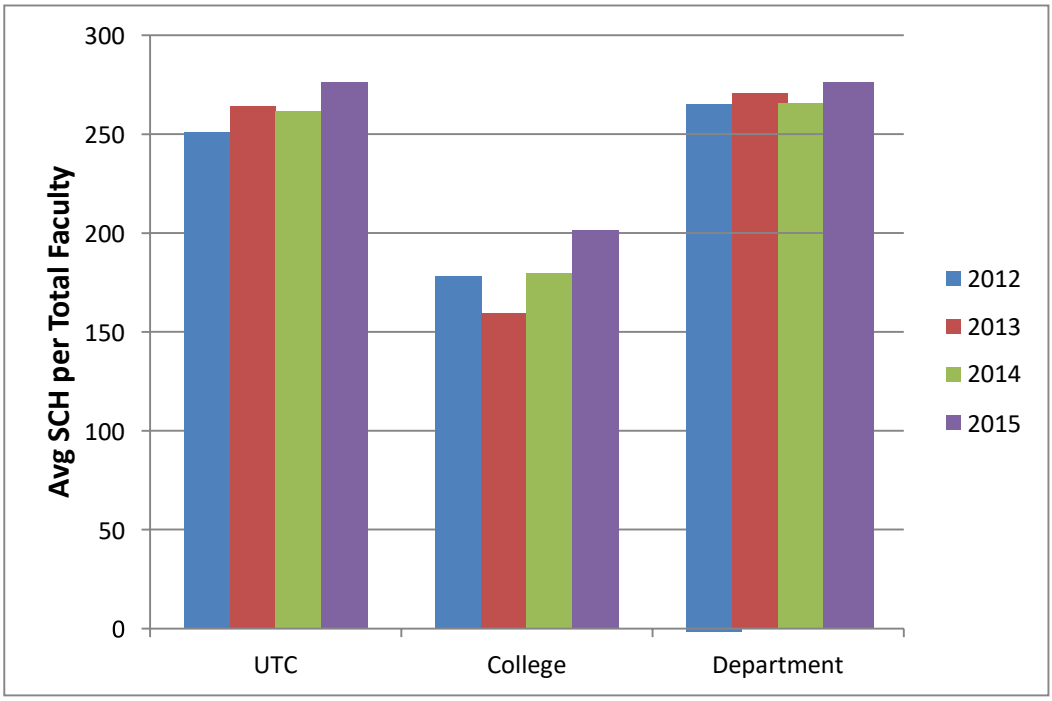

Figure 5. SCH per Total Faculty FTE per Fall Semester year

Table 6. SCH/FTE Faculty/Fall Semester/Year				
		UTC	**College**	**Department**
2012	Adjunct	315	197	319
	NTT	253	148	283
	T/TT	219	187	255
	Total	**251**	**178**	**255**
2013	Adjunct	337	201	357
	NTT	278	147	306
	T/TT	222	153	226
	Total	**264**	**159**	**269**
2014	Adjunct	306	355	365
	NTT	319	145	348
	T/TT	225	162	229
	Total	**261**	**180**	**264**
2015	Adjunct	362	288	436
	NTT	277	166	297
	T/TT	249	194	271
	Total	**276**	**201**	**271**
Key: T: Tenured Faculty / TT: Tenure-Track Faculty / NTT: Non Tenure-Track Faculty				

4.3. Faculty Diversity

Students enrolled in the MS Computer Science Program are increasingly diverse. Studies have shown the importance of faculty diversity to enrolling and retaining students from diverse backgrounds. CSE faculty members reflect the ethnic and gender diversity of our student body and have demonstrated a positive impact in shaping campus culture and encouraging students from multiple minority groups and both genders to enroll and persist through graduation. The diverse nature of faculty and graduate major enrollment is presented in Appendix B.

4.4. Faculty Professional Development

The MS Computer Science faculty strive for continuous professional development, which can advance teaching methods, scholarship, and practice. Ongoing, current and past research projects led by faculty members have in many cases been funded externally through grants and awards. Program faculty regularly attend annual conferences, workshops, expos, meetings, and a multitude of professional organization meetings. Example *Curriculum Vitae* of selected MS Computer Science faculty are shown in Appendix F. Other CVs are available upon request; brief faculty profiles can be viewed online at https://www.utc.edu/college-engineering-computer-science/programs/computer-science-engineering/personnel.php.

4.5. Improvement Processes

The faculty actively engages in regular planning, evaluation, and improvement activities that measure and advance student success. To enrich and improve the curriculum, which is maintained at the department level, faculty members may propose changes including curriculum, program goals, and an overall assessment process based on feedback from students and inputs

during departmental meetings. The department reviews the proposal and, if approved, submits it to the graduate coordinator committee. The committee then reviews and approves the proposed changes. Once approved, the university implements the changes in the following academic year.

4.6. Faculty Evaluation

The program uses an appropriate process to incorporate the faculty evaluation system explained in detail in Chapter 3 of the Faculty Handbook (http://www.utc.edu/faculty-senate/handbook.php). Generally, department heads rank their faculty based on overall performance. The annual Evaluation and Development by Objectives (EDO) process is the main tool used to assess faculty at UTC. The process measures quality of teaching, research, and service. The annual EDO evaluation consists of objectives, performance reports, and evaluation. The EDO form used for faculty evaluation can be found at https://www.utc.edu/academic-affairs/pdfs/1-provost-page-forms/fac-eval-form-rev4-2016.pdf. The department head's EDO sample format can be found at http://www.utc.edu/academic-affairs/pdfs/1-provost-page-forms/dept-head-evaluation-rev6-2015.pdf. Please refer to Section 3.2 for student ratings of faculty, as they are another assessment used for evaluation.

Part V. Learning Resources

5.1. Equipment and Facilities Evaluation

The College of Engineering and Computer Science regularly evaluates its facilities and equipment and makes improvements where necessary. For example, the College is committed to creating an environment that places personal safety and health of the students and faculty first by regularly evaluating laboratories. The College's safety manual describes policies and procedures that govern access to labs, including handling of hazardous materials, inspection, and inventory control. Anyone accessing the labs to use equipment or handle materials within the college must follow accepted procedures and adhere to the published policies, which are easily accessible by students and faculty. The Laboratory Safety Manual can be viewed at https://www.utc.edu/college-engineering-computer-science/pdfs/laboratorysafetymanual.pdf.

5.2. Learning and Information Resources

Students and faculty have access to information resources to support teaching and learning primarily through the newly constructed UTC library. Additionally, the Walker Center for Teaching and Learning supports faculty by offering development sessions and other teaching resources. Section 5.3 provides more information on the Walker Center, and the following subsections provide information on the new UTC Library.

A. UTC Library General Information

The mission of the UTC Library is to support the teaching and research of faculty and students at the University of Tennessee at Chattanooga through the development of collections and services to promote and enhance the university's curriculum and research endeavors. The Library has 21 faculty librarians, 14 staff specialists, and over 700 hours of student help to support the UTC community. The total library budget for 2016 was approximately $3.7 million.

UTC opened a new library facility in January 2015. This new 184,725 square foot facility is open 125 hours per week during the academic semester and combines traditional library services like reference, research assistance, and circulation with cutting-edge amenities like the Studio (featuring recording space, high-spec computing hardware and software, 3D modeling and printing, and video/audio equipment circulation). Furthermore, the library now houses important student and faculty service points including the Center for Advisement, the Writing and Communication Center, and the Walker Center for Teaching and Learning. The new library also boasts 37 group study rooms, 2 practice presentation rooms, 8 conference rooms, and a computer lounge with access to 142 Windows and 36 Macintosh computers. Finally, the library houses unique and historical book and manuscript collections, the University Archives, and the permanent University art collection within a climate controlled state-of-the-art Special Collections facility. The new UTC Library page at https://www.utc.edu/library/about/building/ provides more detailed information on features of the library and services offered. An informational sheet is also available in Appendix D. Additional information about the UTC Library is available at http://www.utc.edu/library.

B. Library Collections and Services 2015-2016

As of July 1, 2016, the Library has available 70,197 serial titles, including open access titles, through subscriptions to full-text resources, databases, journal packages, and individual journals. Of those, 10,998 are direct subscriptions in print, microfilm, and digital forms. Many core journal titles for Computer Science are made available through large multidisciplinary journal packages and databases without an impact on the direct allocation for Computer Science. The Library has identified 1086 print and electronic journals that support Computer Science subjects. Disciplines within the College of Engineering and Computer Science are currently

responsible for $143,986 of the total $1,046,245 spent by the Library toward ongoing serial and database subscriptions.

The UTC Library provides access to electronic resources with the following databases supporting Computer Science: the Association of Computing Machinery Digital Library, Computing Database, Safari Tech Books Online, and the IEEE/IET Electronic Library. In addition, the Library makes available numerous multidisciplinary databases such as Web of Science, ProQuest Central, OmniFile Full Text Mega, Academic OneFile, and JSTOR to supplement subject-specific resources. Access to thousands of online full- text journals is also available through packages from top publishers like Springer/Nature, Taylor and Francis, Sage, Wiley, and Elsevier. See Appendix E for a sample listing of computer science journals available in the UTC Library. A comprehensive list of journals is available upon request.

As of July 1, 2016, the Library's print (466,255) and electronic (274,647) monograph collection consists of 740,902 unique titles, of which 31,962 bear the call numbers Q, QA, T, and TK, which are appropriate to the study of Computer Science. The Library's collection of physical (22,344) and online streaming (75,652) audio/visual (A/V) material consists of 97,996 unique titles, of which 30 are appropriate to Computer Science. Each year, a portion of the Library's materials budget is allocated to purchase books, audio/visual materials, and other one-time resources. The 2015-2016 Library allocation for one-time expenditures for Computer Science was $5,013 (for 110 books) from a total amount of $148,000 spent across all academic departments. In 2015-2016, 393 books and/or audio/visual items were checked out by Computer Science faculty, staff, and students.

C. Services

The Library offers interlibrary loan (ILL) service at no cost to students and faculty who

need to acquire materials that are not owned or accessible by the Library. Patrons can submit and track progress of requests, receive email notification of materials that have arrived, and obtain articles electronically through the electronic ILL management system, ILLiad. The Library also participates in a nationwide program, Rapid ILL, which expedites article delivery to the patron. In 2015-2016, 7,995 ILL borrowing requests were filled for the UTC community; of those, 30 were filled for faculty and students in Computer Science.

The Library offers a well-utilized Course Reserve service for faculty and students so that faculty may place high demand materials on reserve to ensure they are available to students. The Library also provides a scanning service for faculty, ensuring high quality and accessible scans of materials related to research and courses.

The Library has generous circulation policies and allows semester-long borrowing of monographs for students and year-long borrowing for faculty members. In 2015-2016, monographs and A/V materials circulated 26,413 times. In addition, the Library circulates laptop computers, other tech equipment (cameras, calculators, e-book readers, and more), and group study rooms are available to students. Last year, laptops and other equipment circulated 44,515 times, while group study rooms had over 21,795 reservations.

The Library boasts a busy, well-respected, and growing instruction program. In 2015-2016, instruction librarians taught a total of 446 courses and reached 7,470 students across all academic disciplines. Librarians work closely with faculty to design instruction sessions tailored to course and assignment objectives. Librarians teach much needed information literacy and research skills, as well as the basics of citation style and strategies for avoiding plagiarism.

The Library's reference desk is open 91 hours per week to assist faculty and students with research queries. In addition to face-to-face assistance, the Library offers online reference

services in the form of real-time instant messaging assistance, an e-mail reference service, and traditional telephone services. In the last year, UTC librarians answered 13,976 reference questions. One-on-one research consultations are also available to any student seeking in-depth assistance. In the 2015- 2016 academic year, librarians provided 496 individual research sessions.

A Library Liaison program is in place where a librarian is assigned to each academic department to enhance communication, collection development, and general support. Librarians are matched with departments based on educational background, work experience, and subject expertise. The current Computer Science Liaison, Becky Nasadowski, maintains the Computer Science Subject Guide, which links to electronic resources, websites, and other information to help students and faculty in their research.

The UTC Library Studio functions as the library's service point for multimedia production and design. Services include high-spec PCs and comprehensive design software including Adobe Creative Cloud, Autodesk applications, Camtasia, and SketchUp. Equipment circulation includes A/V gear and accessories, prototyping hardware, and other peripherals. A/V production rooms are available for lighting/photography/videography and audio production, 3D printing services; the Studio offers consultation, instruction, curriculum development, and help at point-of-need.

The Library is also home to the Writing & Communication Center (WCC), which offers all UTC students, faculty, and staff one-on-one assistance with any type of writing, speech or presentation, at any stage of the composition process. In 2015-2016, the WCC experienced record usage and growth, logging 2,233 total consultations with 1,068 patrons. Computer Science students participated in 39 consultations.

5.3. Materials and Support Staff

The MS Computer Science program provides adequate materials and support staff to encourage research and publication. The Walker Center for Teaching and Learning promotes excellence in teaching, learning and the use of technology through dialogue, inquiry, and research. To fulfill these goals, the Center maintains a trustworthy environment to those it serves. The Center also offers faculty feedback and opportunities for reflection on their teaching. Please visit https://www.utc.edu/walker-center-teaching-learning/ for more information.

Part VI. Support

6.1. Operating Budget

The MS Computer Science program's internal and external support are consistent with the budget needs of the program. Table 7 shows the external grants received by the faculty in the department. Appendix A shows the operating budget for the College.

Table 7. External Grants (Funded Proposals, FY 2012 through FY 2017)

	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017
External Funding Numbers	2	3	3	5	7	11
External Funding Award Amounts	460,923	1,100,495	522,116	883,035	2,423,798	1,523,340

6.2. Enrollment and Effectiveness

Enrollment and graduation rates are key components of accountability at UTC. A high-quality experience has been integrated throughout the graduate program in order to maintain high enrollment rates. Faculty build strong relationships with students through smaller classes and one-on-one meetings, and serves as primary mentors of students. The faculty also encourages local industries to hire MS program students, enabling the maintenance of a high student enrollment and retention rates. Please see Section 3.1 for recruitment details and enrollment numbers.

6.3. Program Responsiveness

The MS Computer Science program is responsive to changing local, state, regional and national needs. As mentioned in Section 2.1, the curriculum contents are reviewed regularly, partly to respond to changing regional needs. The new Data Science concentration, launched in

fall 2016, is an example of such response to a changing business environment and student population. The curriculum is designed to provide students with the needed knowledge and skills to function effectively in the "big data" field.

Since the last program review, a strategic plan for the College of Engineering and Computer Science has been under development to further propel the responsiveness of programs it contains, including the MS Computer Science Program. This strategic plan will take effect for the 2015-2020 period and can be seen at http://www.utc.edu/college-engineering-computer-science/pdfs/cecs-strategic-plan-approved-09082016.pdf.

6.4. Graduate Student Data Collection and Placement Evaluation

Graduate students are connected to the College of Engineering and Computer Science's LinkedIn page (https://www.linkedin.com/groups/6715787) upon graduation. The LinkedIn page helps the College stay connected with alumni and track where they currently work. Since 2015, the College has also completed an Annual Review, which is distributed to all alumni in addition to local and regional businesses. The latest review can be found at http://www.utc.edu/college-engineering-computer-science/about-us/annual-review.php.

6.5. Procedure Review

The MS Computer Science program's procedures are regularly reviewed to ensure alignment to institutional policies and mission. This is done every year to comply with and maintain the standards contained in the guidelines of the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC), the recognized regional accrediting body in the eleven U.S. southern states.

Appendix A. Expenditures

Table 8. Expenditures						
	2012-13[1]	**2013-14[1]**	**2014-15[1]**	**2015-16[1]**	**2016-17[1]**	**2017-18**
Actual Expenditures[2]	$796,150	$782,571	$836,274	$903,935	$929,203	$1,108,434
Fall Adjunct Salaries[2]	$22,200	$36,600	$50,800	$41,250	$48,000	$55,619
Spring Adjunct Salaries[2]	$27,600	$67,450	$45,800	$45,250	$28,500	
FT Faculty FTE[2]	9.5	9.5	10.5	10.5	11.5	
Total Major Enrollment	28	34	41	48	49	
Fall SCH[3]	220	222	256	257	296	
Spring SCH[3]	246	196	295	291	352	
Expenditures per FT Faculty FTE	$89,047	$93,329	$88,845	$94,327	$6,652	
Expenditures per Student Major	$30,212	$26,077	$22,753	$20,634	$1,561	
Expenditures per SCH	$1,815	$2,121	$1,693	$1,807	$118	
[1] FY data is July 1 - June 30						
[2] Data contains total department (graduate and undergraduate) results						
[3] Data came from CPSC and CPEN						

Appendix B. Diversity

Table 9. Diversity of Faculty and Graduate Major Enrollment

Fall 2017

Graduate Computer Science Enrollment		
	Female	**Male**
Multiple Races	1	4
Unknown	4	1
American Indian	1	
Asian	4	4
Hispanic		2
Native Hawaiian or Other Pacific Islander		
African American	1	3
White	6	18
Total	**17**	**32**

Faculty		
	Female	**Male**
Multiple Races		1
Unknown		
American Indian		
Asian	1	4
Hispanic		
African American		1
White	5	8
Total	**6**	**14**

Appendix C. Student Ratings

Table 10. Student Ratings of Faculty

Student Rating of Faculty Fall2016								
Computer Science								
	Completely Agree (%)	**Mostly Agree (%)**	**Slightly Agree (%)**	**Neither Agree Nor Disagree (%)**	**Slightly Disagree (%)**	**Mostly Disagree (%)**	**Completely Disagree (%)**	**Unable to Judge (%)**
The instructor is willing to help students.	58	23	7	4	2	3	3	3
The instructor encourages students to be actively engaged in learning the content of this course.	55	23	12	5	2	2	2	3
The instructor provides timely feedback on assignments and exams.	45	25	10	6	8	3	3	2
The instructor includes activities and assignments that help students learn the content of this course.	55	19	14	5	3	3	1	2
The instructor clearly communicates expectations of students for this class.	53	20	9	5	6	4	3	2
The instructor expects high quality work from students.	63	22	7	4	2	1		3
Overall, this class has provided an excellent opportunity for me to increase my knowledge and competence in its subject.	54	20	11	7	3	3	4	3
College of Engineering & Computer Science								
	Completely Agree (%)	**Mostly Agree (%)**	**Slightly Agree (%)**	**Neither Agree Nor Disagree (%)**	**Slightly Disagree (%)**	**Mostly Disagree (%)**	**Completely Disagree (%)**	**Unable to Judge (%)**
The instructor is willing to help students.	58	23	7	4	2	3	3	3
The instructor encourages students to be actively engaged in learning the content of this course.	55	23	12	5	2	2	2	3
The instructor provides timely feedback on assignments and exams.	45	25	10	6	8	3	3	2
The instructor includes activities and assignments that help students learn the content of this course.	55	19	14	5	3	3	1	2
The instructor clearly communicates expectations of students for this class.	53	20	9	5	6	4	3	2
The instructor expects high quality work from students.	63	22	7	4	2	1		3
Overall, this class has provided an excellent opportunity for me to increase my knowledge and competence in its subject.	54	20	11	7	3	3	4	3
Total University								
	Completely Agree (%)	**Mostly Agree (%)**	**Slightly Agree (%)**	**Neither Agree Nor Disagree (%)**	**Slightly Disagree (%)**	**Mostly Disagree (%)**	**Completely Disagree (%)**	**Unable to Judge (%)**
The instructor is willing to help students.	70	15	7	3	2	1	2	1
The instructor encourages students to be actively engaged in learning the content of this course.	69	15	8	3	2	1	2	1
The instructor provides timely feedback on assignments and exams.	62	18	9	3	4	2	3	1
The instructor includes activities and assignments that help students learn the content of this course.	61	17	9	4	3	3	3	1
The instructor clearly communicates expectations of students for this class.	65	16	8	3	3	2	4	1
The instructor expects high quality work from students.	73	14	6	4	1		1	2
Overall, this class has provided an excellent opportunity for me to increase my knowledge and competence in its subject.	66	15	8	4	2	1	4	2

Appendix D. Library Information

New University Library Facts:

- 180,000 square feet
- 5 floors
- Opened January 2015

Details:

The new LEED-certified library is chock full of new strategic campus partnerships and is the premier location for student academic needs outside the classroom. New and expanded partnerships represented in the new building include: Art Department, Center for Advisement and Student Success, Copy Services, Information Technology Division, Disability Resources Center, Southern Writers, Walker Center for Teaching and Learning, and Writing and Communication Center. Designed with a robust technological infrastructure and themes of transparency, collaboration, and flexibility, student access and success was at the center of building planning processes.

- 37 study rooms (29 small, 7 medium, 1 large)
- 2 practice presentation rooms
- 24 hour student study space, opened Sunday to Thursday
- 4 lounges (2 quiet, computer and graduate student)
- Starbucks
- Information Commons (research assistance and 175+ computers)
- Studio 305: advanced media studio and creator space
- Seating for over 2,100

- 7 classrooms
- 8 seminar and conference rooms
- 29 faculty and graduate student carrels
- 2 visiting scholar rooms
- Grand reading room
- Moveable compact stacks with storage for ~600,000 volumes
- New material browsing area (think more Barnes and Noble)
- Media viewing room
- Expanded special collections storage with unique climate controls
- New auditorium housing 2 lecture halls of ~225 seats each adjacent to the new library.

Appendix E. Computer Science-Related Journals

The majority of journals are available online and can be accessed through the UTC Library Journals Search feature. Full-text journals (online and print) in the UTC Library that include computer science and engineering-related content are presented below.

Computer Full Text Journals

ACM computing surveys
ACM journal of computer documentation
ACM journal on emerging technologies in computing systems
ACM queue
ACM transactions on accessible computing
ACM transactions on algorithms
ACM transactions on applied perception
ACM transactions on architecture and code optimization
ACM transactions on Asian language information processing
ACM transactions on autonomous and adaptive systems
ACM transactions on computation theory
ACM transactions on computational logic
ACM transactions on computer systems
ACM transactions on computer-human interactions
ACM transactions on computing education
ACM transactions on database systems
ACM transactions on design automation of electronic systems
ACM transactions on embedded coding systems
ACM transactions on graphics
ACM transactions on information and system security
ACM transactions on information systems
ACM transactions on internet technology
ACM transactions on knowledge discovery from data
ACM transactions on mathematical software
ACM transactions on modeling & computer simulation
ACM transactions on multimedia computing, communications, and applications
ACM transactions on programming languages and systems
ACM transactions on reconfigurable technology and systems
ACM transactions on sensor methods
ACM transactions on software engineering and methodology
ACM transactions on speech and language
ACM transactions on storage

Aircraft Engineering and Aerospace Technology: An International Journal
Annual reviews in control
Anti-corrosion methods and materials
Assembly Automation
Biometrics
Biotechnology progress
Canadian journal of chemical engineering
Circuit World
Civil engineering
Communications of the ACM
Comparative technology transfer and society
COMPEL: International J for Computation and Mathematics in Electrical and Electronic Engineering
Computational Intelligence
Computer
Computer-Aided Civil and Infrastructure Engineering
Computers & chemical engineering
Computing in science & engineering
Education + Training
Energy engineering
Engineering Computations: International Journal for Computer-Aided Engineering
Experimental techniques
Expert Systems
Facilities
Fatigue & Fracture of Engineering Materials & Structures
Human factors
IEEE aerospace & electronic systems
IEEE annals of the history of computing
IEEE antennas & propagation letters
IEEE antennas & propagation magazine
IEEE circuits & devices magazine
IEEE communications letters
IEEE communications magazine
IEEE computational intelligence magazine
IEEE computer applications in power
IEEE computer graphics & applications
IEEE concurrency
IEEE control systems magazine
IEEE design & test of computers
IEEE electrical insulation magazines
IEEE electron device letters
IEEE embedded systems letters

IEEE engineering management review
IEEE industry applications magazine
IEEE intelligent systems
IEEE intelligent transportation systems magazine
IEEE internet computing
IEEE journal of oceanic engineering
IEEE journal of photovoltaics
IEEE journal of quantum electronics
IEEE journal of selected topics in applied earth observations and remote sensing
IEEE journal of selected topics in quantum electronics
IEEE journal of solid-state circuits
IEEE journal on emerging and selected topics in circuits and systems
IEEE journal on selected areas in communication
IEEE magnetics letters
IEEE micro
IEEE microwave & wireless components letters
IEEE microwave magazine
IEEE multimedia
IEEE nanotechnology magazine
IEEE network
IEEE photonics journal
IEEE photonics technology letters
IEEE power and energy magazine
IEEE power electronics letters
IEEE power engineering review
IEEE pulse
IEEE reviews in biomedical engineering
IEEE robotics & automation magazine
IEEE sensors journal
IEEE signal processing letters
IEEE signal processing magazine
IEEE software
IEEE solid state circuits magazine
IEEE technology & society magazine
IEEE transactions on aerospace & electronic systems magazine
IEEE transactions on affective computing
IEEE transactions on antennas & propagation magazine
IEEE transactions on applied superconductivity
IEEE transactions on audio speech and language processing
IEEE transactions on automatic control
IEEE transactions on autonomous mental development

IEEE transactions on biomedical engineering
IEEE transactions on broadcasting
IEEE transactions on circuits & systems for video technology
IEEE transactions on circuits & systems: part I
IEEE transactions on circuits & systems: part II
IEEE transactions on communications
IEEE transactions on computational intelligence and AI in games
IEEE transactions on computer-aided design of integrated circuits and systems
IEEE transactions on computers
IEEE transactions on consumer electronics
IEEE transactions on control systems technology
IEEE transactions on device and material reliability
IEEE transactions on dielectrics & electrical insulation
IEEE transactions on education
IEEE transactions on electromagnetic compatibility
IEEE transactions on electron devices
IEEE transactions on energy conversion
IEEE transactions on engineering management
IEEE transactions on evolutionary computation
IEEE transactions on fuzzy systems
IEEE transactions on geoscience & remote sensing
IEEE transactions on haptics
IEEE transactions on image processing
IEEE transactions on industrial electronics
IEEE transactions on industrial informatics
IEEE transactions on industry applications
IEEE transactions on information forensics and security
IEEE transactions on information technology in biomedicine
IEEE transactions on information theory
IEEE transactions on instrumentation & measurement
IEEE transactions on intelligent transportation systems
IEEE transactions on knowledge & data engineering
IEEE transactions on learning technologies
IEEE transactions on magnetics
IEEE transactions on medical imaging
IEEE transactions on microwave theory & techniques
IEEE transactions on multimedia
IEEE transactions on nanobioscience
IEEE transactions on nanotechnology
IEEE transactions on network and service management
IEEE transactions on neural networks

IEEE transactions on neural systems and rehabilitation engineering
IEEE transactions on nuclear science
IEEE transactions on parallel & distributed systems
IEEE transactions on pattern analysis & machine intelligence
IEEE transactions on plasma science
IEEE transactions on power delivery
IEEE transactions on power electronics
IEEE transactions on power systems
IEEE transactions on professional communication
IEEE transactions on reliability
IEEE transactions on robotics & automation
IEEE transactions on semiconductor manufacturing
IEEE transactions on signal processing
IEEE transactions on smart grid
IEEE transactions on software engineering
IEEE transactions on sustainable energy
IEEE transactions on systems, man & cybernetics: part A
IEEE transactions on systems, man & cybernetics: part B
IEEE transactions on systems, man & cybernetics: part C
IEEE transactions on terahertz science and technology
IEEE transactions on ultrasonics, ferroelectrics & frequency control
IEEE transactions on vehicular technology
IEEE transactions on very large scale integration systems
IEEE transactions on visualization & computer graphics
IEEE transactions on wireless communications
IEEE wireless communication
IEEE/ACM transactions on computational biology and bioinformatics
IEEE/ACM transactions on networking
IEEE/ASME transactions on mechatronics
IEEE/OSA journal of display technology
IEEE/OSA Journal of lightwave technology
IEEE/OSA journal of optical communications and networking
Industrial Lubrication and Tribology
Industrial Relations Journal
Industrial Robot: An International Journal
Information Management & Computer Security
Information Systems Journal
Information systems management
Information Technology & People
Instrumentation and measurement magazine
International Journal of Applied Ceramic Technology

International Journal of Clothing Science and Technology
International journal of intelligent computing and cybernetics
International journal of machine tools and manufacture
International Journal of Numerical Methods for Heat & Fluid Flow
International Journal of Operations & Production Management
International journal of production research
International Journal of Quality & Reliability Management
International Transactions in Operational Research
Internet Research: Electronic Networking Applications and Policy
IT professional magazine
Journal of data and information quality
Journal of experimental algorithms
Journal of manufacturing technology management
Journal of microelectromechanical systems
Journal of Petroleum Geology
Journal of Quality in Maintenance Engineering
Journal of the association for computing machinery
Journal of Time Series Analysis
Journal on computing and cultural heritage
Journal on educational resources in computing
Microelectronics International
Multiscale modeling and simulation
Operations research/Management science (with Quality Control)
Photogrammetric Record
Pigment & Resin Technology
Proceedings of the IEEE
Rapid Prototyping Journal
Risk Analysis
Simulation
Soldering & Surface Mount Technology
Strain
Structural Survey
Technology and culture
Transactions on computational biology and bioinformatics
Wireless Communications and Mobile Computing
Wireless Communications IEEE, Transactions on
Wireless Networks
Wireless Personal Communications
Wood Material Science and Engineering
Wood Science and Technology
World Tunnelling and Subsurface Excavation

Appendix F. Example Curriculum Vitae

A. Resume of Joseph D. Dumas II, Ph.D.

Joseph D. Dumas II
1111 James Boulevard
Signal Mountain, TN 37377

Phone: (423) 425-4084
Web: http://www.utc.edu/faculty/joe-dumas/
E-mail: Joe-Dumas@utc.edu

PROFESSIONAL EXPERIENCE

University of Tennessee at Chattanooga, Chattanooga, TN (1993 - present)

College of Engineering and Computer Science

UC Foundation Professor, 2005-present
UC Foundation Associate Professor, 1999-2005
UC Foundation Assistant Professor, 1997-1999
Assistant Professor, 1993-1997

Graduate Program Coordinator for Computer Science, August 2004-August 2008, August 2016-present; *Departmental Course Scheduling Coordinator*, January 2007-present; *Special Assistant to the Dean of the Graduate School*, May 2008-August 2010; *Acting Head of the Computer Science and Engineering Department*, May 2007-July 2008; *Outstanding Computer Science Teaching Award*, December, 1998; November, 2002; April, 2009; *CSE Outstanding Service Award*, April 2016; *CSE Star Service Award*, April 2013. Courses taught at UTC include: Computer Architecture; Advanced Computer Architecture; Embedded Microcontroller Systems; Real-Time Embedded Systems; Advanced Computer Systems; Mini/Micro Computer Systems; Graduate Project; Group Software Project; Digital Logic and Introduction to Computer Hardware; Computer System Organization and Assembly Language Programming; Fundamentals of Computer Science I; Introduction to Computing; Microprocessors and Digital Logic; Microcomputer Applications; and Departmental Honors.

NASA Marshall Space Flight Center, Huntsville, AL (1996, 1997, 2000, 2001)

Summer Faculty Fellow

Integrated a man-in-the-loop virtual environment simulation of the operation of the Space Shuttle Remote Manipulator System robotic arm. Wrote data acquisition and TCP/IP network communications software for PC and Silicon Graphics platforms. Developed simulation management and sensor interface code using Sense8's *WorldToolKit*. Integrated specialized virtual reality peripheral devices with Division's *dVISE* and Transom *Jack* to support human

motion capture, virtual reality simulations, and human factors studies for the space program. Developed an innovative glove-based user interface for virtual environments.

UCF Institute for Simulation and Training, Orlando, FL (1993)

Graduate/Postdoctoral Research Assistant, Visual Systems Laboratory
Investigated transport delay measurement and compensation approaches for position trackers and visual displays used in virtual reality simulation environments.

University of Central Florida, Orlando, FL (1989 - 1993)

Graduate Research Assistant/Graduate Teaching Assistant,
Department of Electrical and Computer Engineering
As a research assistant, performed hardware design and interfacing as well as software development for a research project involving digital computer simulation of motor vehicle dynamics. Courses taught: Computer System Design (senior level); Digital Control Systems laboratory (senior level).

Mississippi State University, Starkville, MS (1986 - 1989)

Graduate Research Assistant/Graduate Teaching Assistant, Department of Electrical Engineering
As a research assistant, performed hardware design, troubleshooting, and evaluation, architectural evaluation, and MC68020 assembly language programming for the Mapped Array Differential Equation Machine (MADEM) multicomputer research project. Courses taught: Control System Technology (for Electrical Engineering Technology); Electronic Technology III (for EET); Electrical Engineering Design Laboratory (senior level); Digital Devices laboratory.

University of Southern Mississippi, Hattiesburg, MS (1985 - 1986)

Visiting Instructor, Department of Engineering Technology
Courses taught: Digital Logic lecture and laboratory (for Computer Engineering Technology); Microprocessor Systems laboratory (for CET, senior level); Control Systems laboratory (for Electronic Engineering Technology, senior level); Network Analysis laboratory (for EET, senior level).

Seismic Engineering Company, Dallas, TX (1984 - 1985)

Product Line Engineer
Designed and prototyped custom interface hardware and custom software for a Z80 microprocessor-based controller of seismic data acquisition devices and other peripheral equipment. Provided customer support for the peripheral equipment controller product line. Designed, built, and repaired small test fixtures for analog and digital circuits. Solved component selection and substitution problems for manufacturing.

University of Southern Mississippi, Hattiesburg, MS (1981 - 1983)

Part-Time Faculty Replacement, Department of Engineering Technology
Assisted faculty members with coordination of laboratory activities and evaluation of student work. Assisted students with laboratory work. Calibrated and maintained test equipment.

EDUCATION

University of Central Florida, Orlando, FL (1989 - 1993)

Ph.D. degree in Computer Engineering, May, 1993. 3.94 GPA. Primary research and coursework area: Digital computer simulation of continuous systems. Dissertation: "Measuring and Compensating for Transport Delay in a Real-Time Interactive Driving Simulator." Awarded Link Foundation Fellowship in Advanced Simulation and Training for 1991-92 academic year.

Mississippi State University, Starkville, MS (1986 - 1989)

M.S. degree in Electrical Engineering with emphasis in Digital Computing Systems, May, 1989. 4.00 GPA. Master's thesis: "Hardware Support for High-Performance Message-Passing Communications in the MADEM Multicomputer." Elected to membership in Tau Beta Pi, national engineering honor society, and Eta Kappa Nu, electrical engineering honorary association.

University of Southern Mississippi, Hattiesburg, MS (1979 - 1984)

B.S. degree in Electronic Engineering Technology with minor in Computer Science, awarded *summa cum laude* (4.00 GPA) in May, 1984. Senior Honors thesis: "Transformerless Audio Power Amplifier with Darlington Outputs." Elected to membership in Omicron Delta Kappa, national leadership honor society. Charter member and first president of Alpha Mississippi chapter of Tau Alpha Pi, national engineering technology honor society.

PROFESSIONAL SOCIETY MEMBERSHIPS

IEEE Computer Society

UTC IEEE-CS student branch counselor, 2000-07; co-counselor, 2010-2013
Chattanooga IEEE-CS chapter second vice chair, 2000-03
Chattanooga IEEE section director (member of Executive Committee), 1996-98
Chattanooga IEEE-CS chapter chair, 1995-96
Chattanooga IEEE-CS chapter vice chair, 1994-95

PUBLICATIONS

Dumas, Joe. "From Introduction to Operating Systems to Computer Architecture: Does an Online Prerequisite Course Prepare Students Better?" *Journal of Computing Sciences in Colleges*, Vol. 33, No. 2, December, 2017.

Dumas, Joseph D. II. *Computer Architecture: Fundamentals and Principles of Computer Design (Second Edition)*, copyright 2017 by CRC/Taylor & Francis Group, ISBN-13: 978-1498772716.

Dumas, Joseph D. II. *Solutions Manual for Computer Architecture: Fundamentals and Principles of Computer Design (Second Edition)*, copyright 2017 by CRC/Taylor & Francis Group, ISBN-13: 978-1498772754.

Dumas, Joe. "Online vs. Face-To-Face Student Performance in an Introduction to Operating Systems Course," *Journal of Computing Sciences in Colleges*, Vol. 32, No. 2, December, 2016.

Dumas, Joseph. Chapter 22, "Performance Enhancements" in *Computing Handbook, Third Edition: Computer Science and Software Engineering* edited by Teofilo Gonzalez, Jorge Diaz-Herrera, and Allen Tucker; copyright 2014 by Chapman and Hall/CRC, ISBN 978-1-4398-9852-9.

Dumas, Joseph. "Learning With 'Hands-On' Computer Architecture Projects When You Don't Have Real Hardware" presented at the Consortium for Computing Sciences in Colleges: Southeastern conference, November, 2013

Dumas, Joseph. *CPSC/CPEN 305, Digital Logic and Introduction to Computer Hardware: Course and Lab Workbook*, published through UTC Bookstore, most recent edition August, 2008.

Dumas, Joseph D. II. *Computer Architecture: Fundamentals and Principles of Computer Design*, copyright 2006 by CRC/Taylor & Francis Group, ISBN 0-8493-2749-0.

Dumas, Joseph D. II. *Solutions Manual for Computer Architecture: Fundamentals and Principles of Computer Design*, copyright 2006 by CRC/Taylor & Francis Group, ISBN 0-8493-9171-7.

Tyler, Thomas R.; Novobilski, Andy; Dumas, Joe; and Warren, Amye. "The Utility of Perspecta 3D Volumetric Display for Completion of Tasks," Human Vision and Electronic Imaging X, Proc. SPIE, Vol. 5666, January, 2005.

Hamilton, George S.; Dumas, Joseph D.; Brookman, Stephen; and Tilghman, Neal. "Evaluating the Usability of Pinchigator, a System for Navigating Virtual Worlds Using Pinch Gloves," *Proceedings of the Huntsville Simulation Conference*, October, 2003.

Dumas, Joseph; Novobilski, Andrew; Ellis, Dawn; and Paschal, Mark. "VR on a Budget: Developing a Flight Simulator in a Small Institution with Off-The-Shelf Hardware and Open Source Software," *Journal of Computing Sciences in Colleges*, Vol. 18, No. 2, December, 2002.

Dumas, Joseph. "Human Motion Tracking and Glove-Based User Interfaces for Virtual Environments in ANVIL,"*Research Reports: 2001 NASA/ASEE Summer Faculty Fellowship Program*, National Aeronautics and Space Administration, report number NASA/CR-2002-211840, July, 2002.

Dumas, Joseph. "Peripheral Device Interfaces to Support Virtual Reality Applications and Human Factors Studies in ANVIL," *Research Reports: 2000 NASA/ASEE Summer Faculty Fellowship Program*, National Aeronautics and Space Administration, report number NASA/CR-2001-210797, September, 2001.

Dumas, Joseph. "Virtual Environment User Interfaces to Support RLV and Space Station Simulations in the ANVIL Virtual Reality Lab," *Research Reports: 1997 NASA/ASEE Summer Faculty Fellowship Program*, National Aeronautics and Space Administration, report number NASA/CR-1998-208803, September, 1998.

Dumas, Joseph; Hale, Joseph; and Dabney, Richard. "Integration of the Space Shuttle Remote Manipulator System Virtual Environment Simulation," *Proceedings of the 1997 IEEE International Conference on Systems, Man, and Cybernetics*, Vol. 5, October, 1997.

Dumas, Joseph, and Klee, Harold. "Time Delay Measurement in a Real-Time Simulation Environment," Society for Computer Simulation *Transactions*, Vol. 14, No. 3, September, 1997.

Dumas, Joseph. "Integration of the Shuttle RMS/CBM Positioning Virtual Environment Simulation," *Research Reports: 1996 NASA/ASEE Summer Faculty Fellowship Program*, National Aeronautics and Space Administration, report number NASA-CR-205205, October, 1996.

Dumas, Joseph, and Klee, Harold. "Design, Simulation and Experiments on the Delay Compensation for a Vehicle Simulator," Society for Computer Simulation *Transactions*, Vol. 13, No. 3, September, 1996.

Klee, Harold, and Dumas, Joseph. "Theory, Simulation, Experimentation: An Integrated Approach to Teaching Digital Control Systems," *IEEE Transactions on Education*, Vol. 37, No. 1, February, 1994.

GRANTS RECEIVED

Equipment Donation, National Aeronautics and Space Administration, Marshall Space Flight Center, November, 2010; $228,393.

Equipment Donation, Sun Microsystems, November, 2008; $24,995.

Academic Excellence Grant, Sun Microsystems, March, 2007; $3,995.

Equipment Donation, National Aeronautics and Space Administration, Marshall Space Flight Center, June, 2004; $110,965.

Lupton Renaissance Grant for "Enhanced Information Perception through Virtual Reality," University of Chattanooga Foundation, April, 2003; $69,900 (co-PI with Dr. Andy Novobilski).

UTC Faculty Development Grant (sabbatical leave for Fall semester 2003), February, 2003; $30,600.

External grant for development of a virtual reality Space Shuttle flight simulator, Wolf Aviation Fund, July, 2001;$9,246 (co-PI with Dr. Andy Novobilski).

NASA Summer Faculty Fellowship, Marshall Space Flight Center, May, 2001; $10,000.

NASA Summer Faculty Fellowship, Marshall Space Flight Center, May, 2000; $10,000.

Software grant from Cypress Semiconductor Corporation, October, 1998; $2,475.

UTC Faculty Development Grant, September, 1997; $844.

NASA Summer Faculty Fellowship, Marshall Space Flight Center, May, 1997; $10,000.

NASA Summer Faculty Fellowship, Marshall Space Flight Center, May, 1996; $10,000.

UTC Instructional Excellence Grant, October, 1993; $1,422.

B. Resume of Mina Sartipi, Ph.D.

Dr. Mina Sartipi

UC Foundation Professor — Lead Scientist for Smart Cities at UTC

Computer Science and Engineering

University of Tennessee Chattanooga (UTC)

Phone: 423-425-5336 — Phone: 423-425-5511

E-mail: mina-sartipi@utc.edu — Home Page: http://www.utc.edu/faculty/mina-sartipi/

EDUCATION

Ph.D in Electrical and Computer Engineering Minor in Mathematics	Georgia Institute of Technology	2003 - 2006
M.S. in Electrical and Computer Engineering Minor in Mathematics	Georgia Institute of Technology	2001 - 2003
B.S. in Electrical Engineering	Sharif University of Technology Tehran, Iran	1996 - 2000

RESEARCH AREAS

- Smart Cities (Transportation, Energy, and Health)
- Advanced Wireless Communications
- Cyber-Physical Systems (CPS)
- Data Acquisition and Compressive Sensing
- Modern Error Control Coding and Information Theory

EXPERIENCE

Lead Scientist for Smart Cities and Urban Science — Chattanooga, TN — 2016 - present

University of Tennessee at Chattanooga

- Coordinating Smart City research and the strategic vision for Urban Scienc
- Building a multidisciplinary collaboration in this area across the campus
- Growing Urban S&T's recognition
  - Invited to panels and workshops
  - Featured in a White House News Release - October 2016
  - Live demo at the Smart Cities Connect & US Ignite Application Summit - 2017
- Success in securing research funding
  - NSF, NIH, industry, and state
- Leading efforts in establishing a new PhD concentrations at UTC
  - Recruiting PhD students and coordinating the program
- Coordinating collaborative efforts with other academic institutions and national labs
- Organized the first Undergraduate Research and Creative Endeavor (URaCE) fellowships for Smart City applications

Current Collaborators:

- The Enterprise Center
- US Ignite
- Smart Gigabit Communities
- MetroLab Networks
- South Big Data Hub
- Georgia Tech Research Institute
- Chattanooga DOT/ TDOT
- Electric Power Board of Chattanooga
- Tennessee Valley Authority
- Siskin Hospital
- Erlanger Health Systems
- University of Tennessee Knoxville
- Portland State University
- Colorado School of Mines
- University of TX Dallas

UC Foundation Professor, Chattanooga, TN 2015 -

Department of Computer Science and Engineering present

University of Tennessee at Chattanooga

- PhD program coordinator
- Proposing algorithms for urban connectivity, observability, and controllability
- Proposing algorithms for connected autonomous vehicles in urban environments
- Developing algorithms for anomaly detection and power error billing
- Developing personalized trip planning based on multi-modal mobility
- Developing a data-driven smart health system to improve the life quality of human being
- Investigating user-aware demand response of residential and commercial buildings through smart models
- Proposing an infrastructure for the next-generation wireless communications

UC Foundation Associate Professor, Chattanooga, TN 2011 - 2015

Department of Computer Science and Engineering

University of Tennessee at Chattanooga

- Proposed an optimal balance between computation and communication needs for networks of sensors in applications such smart manufacturing systems
- Proposed an efficient data acquisition in advanced metering infrastructure in smart grid
- Proposed mStroke - a smart system for remote monitoring of post-stroke patients
- Proposed an enhanced compression algorithm in distributed sensing applications
- Introduced a multiple description coding scheme to restore the image from a small subset of samples with reasonable accuracy

Visiting Faculty, Atlanta, GA July 2014 -

Information and Communications Lab December 2014

Georgia Tech Research Institute

- Introduced an algorithm to reduce PAPR at the receiver using compressive sensing
- Proposed sub-sampled compressive-sensing receiver processing
- Investigated non-uniform sampling in both the receiver and the transmitter for hyper-wideband enabled RF messaging

Assistant Professor, Chattanooga, TN 2006 - 2010

Department of Computer Science and Engineering

University of Tennessee at Chattanooga

- Created a wireless sensor network research group
- Built a communication lab for telecommunication undergraduate and graduate courses
- Proposed TinyTermite - a secure and scalable routing algorithm for MANETs
- Proposed Information hiding scheme using modern error control coding

Assistant Professor, Chattanooga, TN 2006 - 2007

Department of Electrical Engineering

College of Engineering and Computer Science

University of Tennessee at Chattanooga

- Implemented an energy-efficient multicast algorithm on TinyOS-based Intel Mote2
- Built a wireless sensor network lab for graduate students

Graduate Research Assistant, Georgia Tech Atlanta, GA 2002 - 2006

- Introduced an energy-efficient and reliable multicasting protocol for wireless sensor networks
- Proposed a new design criteria for data compression in wireless sensor network
- Designed two-dimensional codes by two-dimensional wavelet transform
- Generated new algebraic finite-length low-density parity check (LDPC) codes
- Proposed a new scheme for generating rate-adaptive codes by wavelet transform

- Assisted with the preparation of research proposals and technical reports

Graduate Teaching Assistant, Georgia Tech Atlanta, GA Fall 2001

- Taught Circuit Analysis

Mentoring Students:

Postdoctoral Scholar:

- Zhen (Edward) Hu

- Manju Katragadda (fall 2009)
- Matthew Andersen (spring 2010)

Current Students:

- Robert Fletcher (spring 2011)
- Jin Cho
- Ben Johnson (summer 2011)
- Rebekah Johnson
- Preethi Ramchandra (spring 2012)
- Jose Stovall (UG Student)
- Robert Derveloy (summer 2013)
- Keith Hollingsworth (UG Student)
- Hafiz Ahmed (spring 2013)
- Daniel Velasques (UG Student)
- Brian Williams (summer 2015)

Previous Students:

- Brandon Allen (spring 2013, fall 2015)
- Josh Patterson (Graduated fall 2008)
- Mohamed Eltom (Graduated fall 2009)
- Austin Harris (fall 2015, fall 2017)

FUNDED AWARDS:

- PI, NSF $298,325 2017-2019

  in collaboration with Dr. Samoylov and Dr. McMurray, Georgia Tech Institute of Technology

  US Ignite: Collaborative Research: Focus Area 1: Fleet Management of Large-Scale Connected and Autonomous Vehicles in Urban Settings

- PI, NSF $119,829 2016-2019

  in collaboration with Dr. Mohagheghi (Lead PI) and Dr. Tabares, Colorado School of Mines

  Collaborative Research: Robust Asset-and-User-Aware Dispatch of the Power Distribution Grid during Extreme Temperatures

- PI, NIH $384,747 2014-2017

  in collaboration with Dr. Fell, Dr. Yang, and Dr. Heath, UTC

  mStroke: Mobile Technology for Post-Stroke Recurrence Prevention and Recovery

- Co-PI, NSF $585,020 2013-2018

  in collaboration with Dr. Yang (PI), Dr. Kizza, Ms. Winters, and Dr. Thompson, UTC

  Making Opportunities for Computer Science and Computer Engineering Students (MOCS)

- PI, TVA $24,500 2017

  TVA Power Billing Dashboard for Error Detection and Correction Project.

- PI, Tennessee Higher Education Commission $92,000 2017-2018
  in collaboration with Dr. Kandah
  Enabling Wireless 3C Technologies for Smart and Connected Cities

- PI, University of Tennessee Chattanooga, Collaborative $7,500 2017
  Research Initiative for Sponsored Programs (CRISP)
  in collaboration with Dr. Fell, Dr. Heath, Dr. Hu, and Dr. Qayyum
  Post Stroke Management Using Hospital Data and Big Data Analytics

- PI, Tennessee Higher Education Commission $95,503 2016-2017
  in collaboration with Dr. Tanis
  Smart Urban Connectivity Powered by Mobility-on-Demand
  Public Transportation and City-Wide Small Cells for Public Communications

- Co-PI, Tennessee Higher Education Commission $97,942 2016-2017
  in collaboration with Dr. Heath (PI) and Dr. Newman, UTC
  Intelligent Urban Planning

- Co-PI, Tennessee Higher Education Commission $99,385 2016-2017
  in collaboration with Dr. Reising (PI) and Dr. Loveless, UTC
  Smarter Buildings through Smarter Models

- PI, NSF Cyber-Physical Systems $469,064 2009-2013
  in collaboration with Dr. Craven, UTC
  CPS Foundations in Computation and Communication

- PI, Tennessee Higher Education Commission $54,500 2015-2016
  Multi-modality Heterogeneous Data Analytics for Smart Health

- PI, Tennessee Higher Education Commission $59,500 2015-2016
  Sensing, Communications, and Analysis in Smart Grid

- PI, Tennessee Higher Education Commission $50,000 2014-2016
  Spectral and Energy-Efficient Distributed Multicast Algorithm for WSN

- PI, Tennessee Higher Education Commission $35,000 2013-2015
  Communication and Data Processing Tools for Automated
  Fall Risk Assessment System

- PI, Tennessee Higher Education Commission $85,000 2013-2015
  Data Acquisition and Communication in Smart Grid Networks

- PI, Tennessee Higher Education Commission $91,600 2012-2015
  A Power Efficient Multicasting Scheme in Distributed Sensing Application

- Co-PI, Variable Technologies, LLC $15,000 2011
  PI: Dr. Joseph Kizza
  iPhone Sensor Data Server with Web Interactive Interface

- PI, Tennessee Higher Education Commission $165,000 2007 -
  Data Acquisition in Wireless Sensor Networks Using 2011

Distributed Rateless Coding

- Co-PI, Wheeler Odor Research $20,000 2007 - 2008
  Sustainable and Scalable Wireless Odor Sensor Network

PROFESSIONAL ACTIVITIES

- NSF Panelist, 2009 - present
- Member of the board of directors at the Enterprise Center in Chattanooga, TN, April 2017-present
- Member of the board of directors at Variable Inc, 2012-present
- Presenter at the University of Tennessee (UT) Board of Trustees meeting, UT System Delegation, and Hamilton County Legislative, 2016-2017
- Presenter at multiple federal funding agency workshops, 2016 - present
- Keynote Speaker, Mid SouthEast ACM Conference - 2015
- Planning member of the South Big Data Hub - Mobile Health, 2016 - present
- Technical Program Committee member for the Wireless / Radio Access Technologies
- Technical Program Committee member for the IEEE International Conference on Computing, Networking and Communications (ICNC)
- Technical Program Committee member for IEEE Globecom
- Reviewer for the IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE Transaction on Wireless Communications, IEEE Transactions on Communications, IEEE Transaction on Communications Letters, IEEE Journal on Selected Areas in Communications Special Issue, IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), IEEE Infocom, IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)
- IEEE member of Women in Engineering, 2005-present

- IEEE member, Signal Processing Society and Communications Society, 2003-present
- Served as a member of the STEM advisory board for CGLA (Chattanooga Girls Leadership Academy), 2009
- Faculty advisor for the Girls in Computer Science (GiCS) at University of Tennessee Chattanooga

PUBLICATIONS

1. J. Cho, Z. Hu, and M. Sartipi, “Non-Intrusive A/C Load Disaggregation Using Deep Learning,” accepted to appear in the Proc. of 2018 IEEE Power & Energy Society T&D Conference & Exposition, April 2018.
2. H. True, N. Fell, A. Harris, J. Cho, Z. Hu, M. Sartipi, "Functional Measurement Post-Stroke via Mobile Technology,” Accepted to be in the Proc. of American Physical Therapy Association’s Combined Sections, February 2018.
3. J. Cho, Z. Hu, and M. Sartipi, “A/C Load Forecasting Using Deep Learning,” accepted to appear in the Proc. of IEEE CPS - Big Data and Data Science, December 2017.
4. H. Suarez, A. Harris, Z. Hu, and M. Sartipi, “HIPAA Compliant Data Solution For a Smart Mobile Health Application,” in the Proc. of ACM Mid-Southeast, November 2017.
5. R. Thompson, Z. Hu, J. Cho, J. Stovall, A. Harris, and M. Sartipi, “See-Through Technology Using V2X Communication,” in the Proc. of ACM Mid-Southeast, November 2017.
6. R. Thompson, Z. Hu, J. Cho, J. Stovall, A. Harris, and M. Sartipi “Enhancing Driver Awareness Using See-Through Technology,” accepted WCX17: SAE World Congress Experience
7. J. Cho, Z. Hu, N. Fell, G. Heath, R. Qayyum, and M. Sartipi, “Hospital Discharge Disposition of Stroke Patients in the State of Tennessee,” Journal of the Southern Medical Association, September 2017.

8. J. Cho, Z. Hu, and M. Sartipi, "Post-stroke Discharge Disposition Prediction using Deep Learning," the Proc. of IEEE Southeastcon, March 2017.

9. B. Williams, B. Allen, Z. Hu, H. True, J. Cho, A. Harris, N. Fell, and M. Sartipi, "Real-Time Fall Risk Assessment Using Functional Reach Test," The International Journal of Telemedicine and Applications, January 2017.

10. A. Harris, H. True, Z. Hu, J. Cho, N. Fell, and M. Sartipi, “Fall Recognition using Wearable Technologies and Machine Learning Algorithms,” the Proc. of IEEE Big Data Conference, December 2016.

11. Z. Hu, S. Mohagheghi, and M. Sartipi, “Flexible Data Acquisition, Compression, and Reconstruction in Advanced Metering Infrastructure”, in Proc. of Power Systems Conference, March 2016.

12. B. Williams, B. Allen, H. True, N. Fell, D. Levine, and M. Sartipi, “A Real-time, Mobile Timed Up and Go System”, in Proc. of IEEE Body Sensor Networks Conference, June 2015.

13. Z. Hu, S. Mohagheghi, and M. Sartipi, “Efficient Data Acquisition in Advanced Meter Infrastructure”, in Proc. of IEEE Power and Energy Society, July 2015.

14. N. Fell, K. Lowry, E. Smith, B. Wade, H. True, B. Allen, and M. Sartipi, “Validation of the Functional Reach Test in a Mobile Platform: A Pilot Study with Subjects Post-Acute Stroke”, Mobile Health in Rehabilitation, Boston University, Oct. 2014.

15. B. Allen, R. Derveloy, N. Fell, W. Gasior, G. Yu, and M. Sartipi, “Telemedicine Assessment of Fall Risk Using Wireless Sensors,” in Proc. of IEEE International Conference on Sensor and Ad Hoc Communications and Networks, June 2014.

16. B. Allen, R. Derveloy, K. Lowry, H. Handley, N. Fell, W. Gasior, G. Yu and M. Sartipi, “Evaluation of Fall Risk for Post-Stroke Patients Using Bluetooth Low-Energy Wireless Sensor”, in Proc. of IEEE Globecom, December 2013.

17. M. Sartipi, “On the Rate-Distortion Performance of Compressive Sensing in Wireless Sensor Networks”, in Proc. of International Conference on Computing, Networking and

Communications, January 2013.

18. M. Sartipi, “Low-Complexity Distributed Compression in Wireless Sensor Networks”, in Proc. IEEE Data Compression Conference, March 2012.

19. P. Ramchandara, M. Sartipi, “Compressive Sensing Based Imaging via Belief Propagation”, IEEE Asilomar Conference on Signals, Systems, and Computer, October 2011.

20. M. Sartipi, R. Fletcher, “Energy-efficient data acquisition in wireless sensor networks using compressed sampling”, in Proc. IEEE Data Compression Conference, March 2011.

21. L. Yang, M. Sartipi, M. McNeely, “Usable Protection to Healthcare Application”, in Proc. of ACM Workshop on Cyber Security and Information Intelligence Research, January 2011.

22. M. Sartipi, “LDPC Codes for Information Embedding and Lossy Distributed Source Coding”, Proc. of IEEE Data Compression Conference, April 2010.

23. M. Sartipi and J. Patterson, “TinyTermite: A Secure Routing Algorithm on Intel Mote 2 Sensor Network Platform,” Proc. of the twenty-First Conference on Innovative Applications of Artificial Intelligence (IAAI-09), July 2009.

24. M. Sartipi, F. Fekri, “Lossy Distributed Source Coding using LDPC, IEEE Communications Letters, Volume 13, Issue 2, pp. 136-138, February 2009.

25. M. Sartipi, B. N. Vellambi R, N. Rahnavard, F. Fekri,” DSCM: An Energy Efficient Multicast Protocol for Wireless Sensor Networks Using Distributed Source Coding,“ Proc. of IEEE Infocom, April 2008.

26. F. Delgosha, M. Sartipi, and F. Fekri, “Construction of Two-dimensional Paraunitary Filter Banks over Fields of Characteristic Two and their Connections to Error-Control Coding,” IEEE Transactions on Circuits and Systems I, Volume 55, Issue 10, pp. 3095-53109, November 2008.

27. M. Sartipi, F. Fekri, “Distributed Source Coding using Short to Moderate Rate-Compatible LDPC Codes: The Entire Slepian-Wolf Rate Region,” IEEE Transactions on Communications, Volume 56, Issue 3, pp. 400-411, March 2008.

28. M. Sartipi, F. Delgosha, F. Fekri, “Two-Dimensional Half-Rate Codes Using two-Variable Finite-Field Filter Banks,’’ IEEE Transactions on Signal Processing, Volume 55, Issue 12, pp. 5846-5853, December 2007.

29. F. Fekri, M. Sartipi, R. M. Mersereau, R. W. Schafer, “Convolutional Codes Using Finite-Field Wavelets; Time-Varying Codes and more,’’ IEEE Transactions on Signal Processing, Volume 53, Issue 5, pp.1881-1896 May 2005.

30. M. Sartipi, F. Fekri, “Distributed Source Coding in Wireless Sensor Networks Using LDPC Coding: a Non-Uniform Framework,’’ Proc. of IEEE Data Compression Conference, pp. 477 – 477, March 2005.

31. M. Sartipi, F. Fekri, “Distributed Source Coding in Wireless Sensor Networks Using LDPC coding: The entire Slepian-Wolf Rate Region,’’ Proc. of IEEE Wireless Communications and Networking Conference, pp. 1939-1944, March 2005.

32. M. Sartipi, F. Fekri, “Source and Channel Coding in Wireless Sensor Networks Using LDPC Codes,’’ Proc. of IEEE Communications Society Conference on Sensor Communications and Networks, pp. 309-316, October 2004.

33. M. Sartipi, F. Fekri, “Two-Dimensional Error Correcting Codes Using Finite-Field Wavelets,’’ Proc. of IEEE Information Theory Workshop, pp. 22-29, October 2004.

34. M. Sartipi, F. Fekri, “Low-Density Parity-Check Codes Based on Cyclotomic Cosets and Their Extension by Latin-Square Matrices,’’ Proc. of Forty-First Annual Allerton Conference on C ommunication, Control and Computing, October 2003.

Presentations

35. M. Sartipi, “Smart Cities and Urban S&T,”Presented to the UC Foundation, December 2017.

36. N. Fell, M. Sartipi, H. True, B. Allen, B. Williams, A. Harris, J. Cho, Z. Hu, R. Thompson, “Mobile Technology for Post-Stroke Recurrence Prevention & Recovery (mStroke),” 75-minute symposium lecture for the 94th Annual Conference American Congress of

Rehabilitation Medicine (ACRM), Progress in Rehabilitation Research (PIRR).

37. M. Sartipi, “Mobile Technology for Post-Stroke Recurrence Prevention & Recovery,” Presented to the University of Tennessee Health Science Center, November 2017.

38. M. Sartipi, “Data-Enabled Urban Systems,” Presented to the Data Science and Engineering Joint PhD Program, University of Tennessee Knoxville, October 2017.

39. M. Sartipi, "Real-Time See Through Technology for Collected Autonomous Vehicles," US Ignite Application Summit and Smart Cities Connect Conference, Live Demonstration, June 2017.

40. M. Sartipi, "Connected Autonomous Vehicles at UTC,” 1st Tennessee Connected & Automated Vehicle Summit, May 2017.

41. M. Sartipi, “UTC and Smart Cities”, Presented to the University of Tennessee Board of Trustees, March 2017.

42. M. Sartipi, “Chattanooga-Smart City Leadership ”, Presented to the Hamilton County Legislative, March 2017.

43. M. Sartipi, “Data-Enabled Urban Science and Technology”, Presented to the University of Tennessee System delegation, September 2016.

44. J. Cho, M. Sartipi, “Big Data Analytics for Smart Health”, Presented at the ACM Mid-Southeast, October 2016.(Best Student Presentation Award)

45. A. Harris, M. Sartipi, “Activity Recognition using Wearable Technologies and Machine Learning”, Presented at the ACM Mid-Southeast, October 2016.

46. M. Sartipi, “IoT in Smart Cities,” NSF-supported WiFiUS workshop invitation, August 2016.

47. Z. Hu, M. Sartipi, “Chattanooga, TN, Future Wireless GigCity”, NSF Workshop on Wireless Cities, February 2016.

48. Z. Hu, S. Mohagheghi, and M. Sartipi, “Dark Factory: the Next Generation of Smart Manufacturing,” NSF Workshop on Applications and Services in the Year 2021,January 2016.

49. M. Sartipi, “Real-Time Quantitative Assessment of Stroke Rehabilitation Using Wireless Sensors,” Keynote speaker, ACM Mid-SouthEast, October 2015.

50. M. Sartipi, “Real-Time Quantitative Assessment of Stroke Rehabilitation Using Wireless Sensors,” Presented at the Automated Sensor Based Mobility Analysis for Disease Prevention and Treatment Workshop at IEEE Body Sensor Network Conference, June 2015

51. R. Derveloy, M. Sartipi, “Mobile Evaluation of Well-Being for Post-Stroke Patients Using Compressive Sensing”, Presented at the ACM Mid-Southeast, October 2011.

52. P. Ramachandra, M. Sartipi, “Compressive Sensing Based Imaging via Belief Propagation”, Presented at the ACM Mid-Southeast, October 2011.

Invited Papers

53. M. Sartipi and F. Fekri, " Distributed Source Coding using LDPC Codes: Lossy and Lossless Cases with Unknown Correlation Parameter," Forty-Third Annual Allerton Conference on Communication, Control and Computing, October 2005.

54. F. Fekri, F. Delgosha, M. Sartipi, “Results on Finite-Field Wavelets and Their Applications to Error Correcting Codes,” American Mathematical Society special meeting on codes and applications, October 2004.

AWARDS

- Elevated to IEEE Senior membership, 2016
- Received the University Of Tennessee Chattanooga (UTC) Outstanding Faculty Research and Creative Achievement award, 2016
- Received Faculty Evaluation and Development by Objectives (EDO) Exceeds Expectations Performance Award, 2010, 2011, 2013-present
- Received “Keep the Stars Shining” Award, 2012
- Outstanding Researcher in the Department of Computer Science and Engineering,

2010, 2013 & 2015

- Outstanding Researcher in the College of Engineering and Computer Science, 2010, 2014 & 2015
- UC Foundation, 2008

C. Resume of Craig Tanis, Ph. D.

Craig Tanis, PhD

craig-tanis@utc.edu

(423) 402-0226

Assistant Professor

University of Tennessee at Chattanooga

Department of Computer Science

Education

PhD Computational Engineering, University of Tennessee at Chattanooga, 2013

M.S. Computer Science, Tulane University, 1998

B.S.E. Computer Engineering, Tulane University, 1997

Publications

Citation Distance: Measuring Changes in Scientific Search Strategies. R. Whalen, Y. Huang, C. Tanis, A. Sawant, B. Uzzi, N. Contractor. BigScholar, ACM WWW 2016

A New Software Framework for Unstructured Mesh Representation and Manipulation. C. Tanis. PhD Dissertation, Fall 2013

Petrov-Galerkin and discontinuous-Galerkin methods for time-domain and frequency-domain electromagnetic simulations. W. K. Anderson, L. Wang, S. Kapadia, C. Tanis, and B. Hilbert. Journal of Computational Physics, vol. 230, no. 23, Sep. 2011.

Distributed Map-making Using Online Generalized Voronoi Graphs. J. Jennings, C. Kirkwood-Watts, C. Tanis. Proceedings of the Conference on Automated Learning and Discovery (CONALD 98)

Cooperative Localization and Map-making for Mobile Robots. C. Tanis Tulane University Technical Report, May 1997.

Presentations

Campus Champion Fellows XSEDE 2016

Lazy Evaluation of Unstructured Mesh Queries in C++ ACM Mid-Southeast Conference, 2015

Parallel Mesh Management Using PLatt (Poster) SIAM PP12

Professional Affiliations

ACM SIGHPC, SIGHPCEDUCATION. Member, 2014 - Present

XSEDE Campus Champions. Champion for UTC, 2014-Present

Upsilon Pi Epsilon. Member, 1997 - Present

Recognition

XSEDE Campus Champion Fellow 2015-16

2014 UTC Computer Science Teacher of the Year

2013 UTC Computer Science Teacher of the Year

2012 UTC Computer Science Teacher of the Year

Employment

University of Tennessee at Chattanooga – Assistant Professor, Computer Science, 2014 - Present

University of Tennessee at Chattanooga – Lecturer, Computer Science, 2010 - 2013

UTC SimCenter – Graduate Research Assistant, 2007-2010

Tanis Tech LLC – Consultant / Developer, 2006-2010

Advance Internet – Senior Programmer, 1999-2006

Johns Hopkins Applied Physics Lab – Professional Associate, 1998-1999

Tulane University – Graduate Research/Teaching Assistant, 1996-1998

D. Resume of Li Yang, Ph. D.

VITA AND PUBLICATION
Li Yang, Ph.D.

Address:

735 Vine Street, EMCS 314A

Phone: (423) 425 – 4392(W)

University of Tennessee at Chattanooga

Phone: (423) 298 – 3090 (C)

Chattanooga, TN 37403

Fax: (423) 425 - 4392

E-mail: Li-Yang@utc.edu

EDUCATION

Ph.D.	2005	Computer Science, Florida International University, Miami, FL
M.S.	2003	Computer Science, Florida International University, Miami, FL
M.A.	2000	Finance, Jilin University, Jilin, P. R. China
M.A.	1997	Finance, Jilin University, Jilin, P. R. China
Minor	1996	Computer Science, Jilin University, Jilin, P. R. China

ACADEMIC EXPERIENCES

2017.07-Present	Guerry Professor, Department of Computer Science and Engineering, University of Tennessee at Chattanooga, Chattanooga, TN
2016.07-Present	Assistant Dean, College of Engineering and Computer Science, University of Tennessee at Chattanooga, Chattanooga, TN
2014.08-Present	Professor, Department of Computer Science and Engineering, University of Tennessee at Chattanooga, Chattanooga, TN
2011.11-Present	Director of UTC InfoSec Center, A National Center of Academic Excellence – Information Assurance/Cyber Defense (IA/CD), University of Tennessee at Chattanooga, Chattanooga, TN
2008.08-Present	Coordinator of graduate program, Department of Computer Science and Engineering, University of Tennessee at Chattanooga, Chattanooga, TN
2009 – 2014	Associate Professor, Department of Computer Science and Engineering, University of Tennessee at Chattanooga, Chattanooga, TN
2005 – 2009	Assistant Professor, Department of Computer Science and Engineering, University of Tennessee at Chattanooga, Chattanooga, TN
2001 – 2005	Teaching Assistant, Research Assistant, School of Computer Science, Florida International University

AWARDS AND HORNORS

2017	Outstanding Faculty Research and Creative Achievement, University of Tennessee at Chattanooga (UTC)
2017	Outstanding Researcher, College of Engineering and Computer Science, University of Tennessee at Chattanooga (UTC), 2016-2017.

2015 Best Advisor in the College of Engineering and Computer Science and Department of Computer Science and Engineering, UTC, TN

2007, 2010, 2011, 2012 Research Award in the College of Engineering and Computer Science, UTC, TN,

2007, 2010, 2011, 2012, 2013 Research Award in the Department of Computer Science and Engineering, UTC, TN,

2006 to 2015
Exceptional Merit (exceeds expectation), UTC, TN

2004 – 2005
Excellent PhD. student awards in School of Computer Science, FIU,

Miami, FL

FUNDED GRANTS (SELECTED)

2017-2021 NSF CyberCorps: Strengthening the National Cyber Security Workforce, $1,522,456

Lead-PI, DGE- 1663105

2017-2020 National Security Agency (NSA) Cyber Security Curriculum Development $75,000

Grant (**Co-PI**)

2016-2019 NSF Collaborative Research: Enhancing Cyber Security Education Using $164,997

POGIL (**PI**)

2017-2019 NSF US Ignite: Collaborative Research: Focus Area 1: Fiber Network for $299,884

Mapping, Monitoring and Managing Underground Urban Infrastructure (Co-PI)

2017-2018 National Security Agency (NSA) Cyber Security Curriculum Development $39,750

Grant (**Co-PI**)

2017-2018 National Security Agency (NSA), Web Security (**PI**)

$149,898

2017.01-2017.12 THEC, Improving Teacher Quality Grant, EXCEL: EXploring Clean $73,991

Energy through hands-on Learning (**Co-PI**)

2014-2018 NIH: mStroke: Mobile Technology for Post-stroke Recurrence Prevention $384,747

and Recovery (**PI**, with Mina Sartipi as lead-PI)

2013-2015 NSF SaTC: Collaborative Research: Collaborative Research: Bolstering $ 119,869

Security Education through Transiting Research on Browser Security (**PI**)

2013-2019 NSF S-STEM Making Opportunities for Computer Science and $577,964

Computer Engineering Students (MOCS) (**PI**)

2012-2015 NSF SFS, Capacity Building in Mobile Security through

$209,981

Curriculum and Faculty Development (**Lead-PI**)

2013-2014 THEC: Bioinformatics analysis of human genes associated with diseases
$60,000

at higher rates in African Americans (DHRAAs) (**PI**)

2012- 2013 THEC: A Novel Authentication Framework in Mobile Devices (**PI**)
$54,000

2012 – 2015 NSF REU SITE: Research on Biomedical Informatics (**Co-PI**)
$382,528

2011-2012 THEC: Online Opinion Mining on Social Media (**PI**)

$54,244

2011-2013 NSF SFS, Collaborative Project: Developing Faculty Expertise in Information
$100,000

Assurance through Case Studies and Hands-on Experiences (**PI**)

2010-2013 NSF CCLI, Collaborative Project: Teaching Cryptography through Hand-on
$99,985

Learning and Case Studies (**Lead-PI**)

2010-2011 Women in Computing Research (CRA-W), CREU (**Co-PI**)
$23,000

2009-2010 DoD IASP Information Assurance Scholarships Program (**Co-PI**)
$62,279

2009 Oak Ridge National Laboratory, Detecting Intrusions through Fusion of

Program Behavior and Attacker Behavior (**PI**)

$17,746

2009-2010 THEC: Emerging Infectious Disease: A Computational Multi-agent Model (**PI**)
$50,000

2008-2009 Odor Wheeler Foundation: Sustainable and Scalable Wireless Sensor Network
$18,000

to Monitor Chemical Concentration (**Co-PI**)

2009-2010 THEC: A Fast Response and Planning System in Disaster Management (**PI**)
$40,000

2008 UTC Faculty Summer Fellowship, Network Intrusion Detection Using
$5,000

Bayesian Networks

2006-2007 THEC: Information Communications Mediator Model in Disaster Management (PI) $33,250

GRANTS UNDER REVIEW (SELECTED)

NIST Training and Equipping Firefighters with Fast, Reliable and Secure Augmented Reality, **PI**.

PUBLICATIONS (selected journals)

1. Francis Akowuah, Jonathan Land, Xiaohong Yuan, Li Yang, Jinsheng Xu, Hong Wang, Standards and Guides for Implementing Security and Privacy for Health Information technology, A book chapter in Security and Privacy Management, Techniques, and Protocols, accepted, 2017.
2. Xiaohong Yuan, Audrey Rorrer, Li Yang, Bei-Tseng Chu, Kenneth Williams, Huiming Yu, Kathy Winters, Joseph Kizza, Evaluating the Impact of Faculty Workshops for Teaching Information Assurance through Hands-on Exercises and Case Studies, Journal of Information Systems Education (JISE), 2016
3. Xiaohong Yuan, Li Yang, Bilan Jones, Huiming Yu, Bei-Tseng Chu. Secure Software Engineering Education: Knowledge Area, Curriculum and Resources. Information Security Education Journal, 2015.
4. Jiang Y, Qin H, Yang L. Using network clustering to predict copy number variations associated with health disparities. PeerJ 3:e677https://doi.org/10.7717/peerj.677, 2015.
5. Li Yang, Xiaohong Yuan and Dhaval Patel, Interactive Visualization Tools for Cross-Site Scripting and Cross-Site Request Forgery Attacks, International Journal of Information Technology and Computer Science (IJITCS), vol. 15, Issue 3, 2014.
6. Prabir Bhattacharya, Li Yang, Minzhe Guo, Kai Qian, Ming Yang, Learning Mobile Security with Labware, Education column, IEEE Security and Privacy Magazine: Vol 12 No. 1, January-February, 2014, *invited paper*.
7. Wu He, Xiaohong Yuan, Li Yang, Supporting Case-based Learning in Information Security with Web-based Technology, Journal of Information Systems Education (JISE) Special Issue: Global Information Security and Assurance, 2013.
8. Joseph Kizza, Li Yang, Social History of Computing and Online Social Communities, the Encyclopedia of Social Network Analysis and Mining (ESNAM), 2013.
9. Joseph Kizza, Li Yang, Is the Cloud the Future of Computing?, a book chapter in "Security, Trust, and Regulatory Aspects of Cloud Computing in Business Environments", 2013.
10. Hamid R. Nemati, Li Yang (editors). *Applied Cryptography for Cyber Security and Defense: Information Encryption and Cyphering*, ISBN: 978-1-61520-783-1, 2011.
11. Li Yang, Managing Secure Database Systems, a book chapter in Readings and cases in information security: law and ethics, Whitman, M.E. & Mattord, H. J.,(editors), Course Technology, Cengage Learning, ISBN 1-435-44157-5, 2011.
12. Ran Tao, Li Yang, et al., A Host-Based Intrusion Detection System Using Architectural Features to Improve Sophisticated Denial-of-Service Attack Detections, International Journal of Information Security and Privacy, 2010.
13. Li Yang, Alma Cemerlic, Xiaohui Cui. A fine-grained reputation system for reliable routing in wireless ad hoc network, Journal of Security and Communication Network, 2010.
14. Raimund Ege**,** Li Yang, Richard Whitaker, Rewards and Risks in P2P Content Delivery, *International Journal On Advances in Systems and Measurements*, vol. 2, no. 2&3, pages 168-177, year 2009, ISSN: 1942-261x.
15. Li Yang, Cryptographical Issues in Information Security and Privacy, Guest Editorial Preface, *International Journal of Information Security and Privacy*, Vol. 3, No. 3, ISSN: 1930-165-0, 2009.

16. Harkeerat Bedi, Li Yang, Fair Electronic Exchange Based on Fingerprint Biometrics, *International Journal of Information Security and Privacy*, Vol. 3, No. 3, pages 76-106, ISSN: 1930-165-0, 2009.
17. Li Yang, Lu Peng, and Balachandran Ramadass, SecCMP: Enhancing Critical Secrets Protection in Chip-Multiprocessors, *International Journal of Information Security and Privacy*, Volume 2, Issue 4, pp. 54-66, October-December 2008.
18. Li Yang, Chang Phuong, Andy Novobilski, and Raimund Ege, Trust-based Usage Control in Collaborative Environment, International Journal of Information Security and Privacy, 2(2), 31-45, April-June 2008.
19. Li Yang, Raimund Ege, Lin Luo, Aspect-Oriented Analysis of Security in Object-Oriented Distributed Virtual Environments, *Handbook of Research on Information Assurance and Security*, Information Science Reference, ISBN: 978-1-59904-855-0, 2008.
20. Li Yang, Raimund K. Ege**,** Security Enforced Mediation Systems for Data Integration, *INFOCOMP Journal*, pages 1-10, March, 2006.

PUBLICATIONS (selected conference proceedings)

1. Héctor Suárez, Hooper Kincannon, Li Yang, SSETGami: Secure Software Education Through Gamification, Conference on Cybersecurity Education, Research and Practice (CCERP), Kennesaw, GA, October, 2017.
2. David Schwab, Li Yang, Katherine Winters, Matthew Jallouk, Emile Smith, Adam Claiborne, A Secure Mobile Cloud Photo Storage System, Workshop on Network Security Analytics and Automation (NSAA), in conjunction with the 26th International Conference on Computer Communications and Networks, Vancouver, Canada, August, 2017.
3. Xiaohong Yuan, Li Yang, Wu He, Jennifer Ellis, Jinsheng Xu and Cynthia Waters, Enhancing Cybersecurity Education Using POGIL, the ACM Technical Symposium on Computer Science Education (SIGCSE), poster, Seattle, WA, March, 2017.
4. Farah I. Kandah, Oliver Nichols, Li Yang, Efficient Key Management for Big Data Gathering in Dynamic Sensor Networks, Workshop on Computing, Networking and Communications (CNC), Silicon Valley, USA, January, 2017.
5. Oliver Nichols, Li Yang, Xiaohong Yuan, Teaching Security of Internet of Things in Using RaspberryPi, Conference on Cybersecurity Education, Research and Practice (CCERP), Kennesaw, GA, October, 2016.
6. Xiaohong Yuan, Wu He, Li Yang, Lindsay Simpkins, Teaching Security Management for Mobile Devices, Annual Conference on Information Technology Education (SIGITE), Boston, September, 2016.
7. Oliver Nichols, Li Yang, Picture PassDoodle: An Authentication Alternative to Text Passwords, Workshop on Network Security Analytics and Automation, August, 2016.
8. Minzhe Guo, Kai Qian, Li Yang, Hands-on Labs for Learning Mobile and NoSQL Database Security, COMPSAC, Atlanta, GA, June 2016.
9. Eric Reinsmidt, David Schwab, Li Yang, Securing a Connected Mobile System for Healthcare, the 17th IEEE High Assurance Systems Engineering Symposium (HASE 2016), Orlando, FL January, 2016.
10. Xinwen Fu, Li Yang, Modeling Cyber Crime and Investigation Strategies for Digital Forensics Education, The Colloquium for Information Systems Security Education, round table discussion, June 2015.

11. Eric Reinsmidt, Li Yang Mobile Authentication Methodologies in Healthcare Systems, the 26thModern Artificial Intelligence and Cognitive Science Conference, Greensboro, NC, 2015.
12. Lindsay Simpkins, Xiaohong Yuan, Jwalit Modi, Justin Zhan, Li Yang. A Course Module on Web Tracking and Privacy, InfoSecCD 2015 conference.
13. Wenliang Du, Li Yang, Xiaohong Yuan, Joseph Kizza, Browser Security Hands-on Labs and Case Studies, poster presentation at NSF SaTC PI meeting, January, 2015.
14. Li Yang, Xiaohong Yuan and Dhaval Patel, Interactive Visualization Tools for Cross-Site Scripting and Cross-Site Request Forgery Attack, 3rd International Conference on Human Computing, Education and Information Management System (ICHCEIMS 2014), Sydney, Australia, June 4 – 5, 2014.
15. Perron Johnson, Philip Harris, Keheira Henderson, Xiaohong Yuan, Li Yang, A Course Module on Mobile Malware, Information Security Curriculum Development (InfoSecCD), Knennesaw, GA, October, 2014.
16. Wenliang Du, Li Yang, Joseph Kizza, Xiaohong Yuan, New Hands-on Labs on Browser Security, poster SIGCSE, Atlanta, GA, 2014.
17. Xiaohong Yuan, Kenneth Williams, Huiming Yu, Bei-Tseng Chu, Audrey Rorer, Li Yang, Kathy Winters, Joseph Kizza, Developing Faculty Expertise in Information Assurance through Case Studies and Hands-on Experiences, HICSSE, Honolulu, HI, 2014.
18. Minzhe Guo, Prabir Bhattacharya, Kai Qian and Li Yang, WIP: Authentic Learning of Mobile Security with Case Studies, Frontiers in Education Conference (FIE), Oklahoma City, OK, October 2013.
19. Li Yang and Xumin Liu, Work in Progress: Teaching Business Analytics, Frontiers in Education Conference (FIE), Oklahoma City, OK, October 2013.
20. Minzhe Guo, Kai Qian, Ming Yang, KuoSheng Ma, Liang Hong, Li Yang, Android-Based Mobile Sensory System Labware for Embedded System Education, IEEE International Conference on Advanced Learning Technologies (ICALT), Beijing, China, July 2013.
21. Ming Yang, Kai Qian, Minzhe Guo, Prabir Bhattacharya, Guillermo Francia, Li Yang, Enhance Computer Networks Learning with Hands-on Mobile Device Based Labware,Proceedings of the ACM Technical Symposium on Computer Science Education (SIGCSE), March 2013.
22. Minzhe Guo, Prabir Bhattacharya, Ming Yang, Kai Qian, Li Yang, Learning Mobile Security with Android Security Labware, Proceedings of the ACM Technical Symposium on Computer Science Education (SIGCSE), March 2013.
23. David Schwab, Li Yang, User and Device Authentication in a Mobile Cloud Environment, The Proceedings of Cyber Security and Information Intelligence Research Workshop, ACM Digital Library, Oak Ridge, TN, January, 2013.
24. Wade Gasior and Li Yang, Exploring Covert Channel in Android Platform, Cyber Security Conference, Washington D.C., pages 516-520, December, 2012.
25. Hong Qin, Alexander Shapiro, and Li Yang, Emerging Infectious Disease: A Computational Multi-agent Model, BioMedCom Conference, Washington D.C., pages 583-588, December, 2012.
26. Kai Qian, Prabir Bhattacharya, Minzhe Guo, Li Yang, Work in Progress: Real World Relevant Security Labware for Mobile Threat Analysis and Protection Experience, Frontier in Education, Seattle, WA, November, 2012.

27. Li Yang, Joseph Kizza, Andy Wang, C. H. Chen, Teaching Cryptography Using Hands-on Labs, poster, The 43rd ACM Technical Symposium on Computer Science Education (SIGCSE), Raleigh, NC, March, 2012.

28. Wade Gasior, Li Yang, Covert Channel in Smart Phones, Work in Progress (WiP), The 27th Annual Computer Security Applications Conference (ACSAC), Orlando, FL, December, 2011.

29. Rajeshwar Katipally, Li Yang, Anyi Liu, Attacker Behavior Analysis in Multi-stage Attack Detection, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN October, 2011.

30. Wade Gasior, Li Yang, Network Covert Channels on the Android Platform, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN October, 2011.

31. Li Yang, Mina Sartipi, Matt McNeely, Usable Protection to Healthcare Application, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN October, 2011.

32. Li Yang, Joseph Kizza, Andy Wang, C. H. Chen, Develop Case Studies to Teach Cryptography in a Collaborative Environment. *In the Proceedings of the 2011 International Conference on Frontiers in Education: Computer Science and Computer Engineering (FECS'11)*, Las Vegas, NW, 2011.

33. Li Yang, Joseph Kizza, Andy Wang, C. H. Chen, Teaching Cryptography through Hands-on Learning, poster, *Proceedings of the 15th Colloquium for Information Systems Security Education (CISSE)*, Fairborn, OH, June 13-15, 2011.

34. Kai Qian, Li Yang, Innovative CS Capstone Project For Green Smart Computing With WSN In A BOx, The 10th IEEE International Conference on Advanced Learning Technologies, 2010.

35. Swetha Dasireddy, Wade Gasior, Xiaohui Cui and Li Yang, Visualization and Clustering in Network-based Intrusion Detection, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN 2010.

36. Rajeshwar Katipally, Wade Gasior, Xiaohui Cui and Li Yang, Multi stage attack Detection system for Network Administrators using Data Mining, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN 2010.

37. Li Yang, Wade Gasior, Woodlyn Madden, Mark Hairr, Ronald Bailey, Electronic Vehicle Simulation and Animation, 51st Annual Transportation Forum, March 2010.

38. Li Yang, Alma Cemerlic, Integrating Dirichlet Reputation into Usage Control, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN 2009.

39. Harkeerate Bedi, Li Yang, Joseph Kizza, Biometrics based Fair Electronic Exchange, *the Proceedings of Cyber Security and Information Intelligence Research Workshop*, ACM Digital Library, Oak Ridge, TN 2009.

40. Li Yang, Feiqiong Liu, Joseph M. Kizza, Raimund K. Ege. Discovering Latent Topics from Dark Websites, IEEE Symposium on Computational Intelligence in Cyber Security, IEEE Xplore, April 2009.

41. Ran Tao, Li Yang, Lu Peng, Bin Li, Alma Cemerlic. DoS Network Intrusion Detection through Multi-layer Features, IEEE Symposium on Computational Intelligence in Cyber Security, IEEE Xplore, April 2009.

42. Raimund K. Ege, Li Yang, and Richard Whittaker, Extracting Value from P2P Content Delivery, P*roceedings of The Fourth International Conference on Systems and Networks Communications (ICSNC),* IEEE Xplore, France, March 2009.

43. Li Yang, Teaching Database Security and Auditing, *Proceedings of the 40th ACM Technical Symposium on Computer Science Education (SIGCSE),* Chattanooga TN, March 2009.

44. Alma Cemerlic, Li Yang, Joseph M. Kizza, Network Intrusion Detection Based on Bayesian Networks, *Proceedings of Software Engineering and Knowledge Engineering (SEKE08),* July 2008.

45. Li Yang, Raimund Ege, Integrating Trust Management into Usage Control in P2P Multimedia Delivery, *Proceedings of Software Engineering and Knowledge Engineering (SEKE08),* July 2008.

46. Hong Qin, Li Yang, Detection of changes in transitive associations by shortest-path analysis of protein interaction networks integrated with gene expression profiles, *The International Conference on BioMedical Engineering and Informatics (BMEI),* May 2008.

47. Li Yang, Kathy Winters, Joseph M. Kizza, Biometrics Education with Hands-on Labs, ACM Southeast Conference, ACM Digital Library, March 2008.

48. Alma Cemerlic, Li Yang, Network Intrusion Detection Using Bayesian Network, ACM Middle-Southeast Conference, First-place of master student paper awards, Gatlinburg, TN, November, 2007

49. Feiqiong Liu, Li Yang, LDA-based Dark Web Analysis, *ACM Middle-Southeast Conference*, Second-place of master student paper awards, Gatlinburg, TN, November, 2007.

50. Raimund Ege, Li Yang, Secure P2P Delivery of Multimedia, *Proceedings of International Conference Telecommunications (TNS), Networks and Systems from International Association for Development of the Information Society (IADIS),* Lisbon, Portugal, July 2007.

51. Li Yang, Joseph M. Kizza, Alma Cemerlic, Feiqiong Liu, Fine-Grained Reputation-based Routing in Wireless Ad Hoc Networks, *Proceedings of IEEE International Conference on Intelligence and Security Informatics*, New Brunswick, NY, May 2007.

52. Li Yang, Lu Peng, SecCMP: A Secure Chip-Multiprocessor Architecture, Proceedings of Workshop on Architectural and System Support for Improving Software Dependability (ASID), in conjunction with International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), ACM digital library, pages 72-76, San Jose, CA, October 2006.

53. Joseph M. Kizza, Li Yang, Andy Novobilski, Kathy Winters, TMAS Capstone Project., Proceedings of Computer Forensics Conference, Las Vegas, 2006.

54. Li Yang, Joseph M. Kizza, Raimund K. Ege, Malek Adjouadi, A Relationship-based Flxible Authorization Framework for Mediation Systems, *Proceedings of Software Engineering and Knowledge Engineering (SEKE06),* pages 381-385, San Francisco, CA, July, 2006.

55. Li Yang, Joseph M. Kizza, Raimund K. Ege, A Flexible Context-Aware Authorization Framework for Mediation Systems, *Proceedings of IEEE Intelligence and Security Informatics Conference*, San Diego, CA, pages 684-685, Lecture Notes in Computer Science, May, 2006.

56. Li Yang, Raimund K. Ege, Dynamic Integration Strategy for Mediation Framework. *Software Engineering and Knowledge Engineering (SEKE05)*, Taipei, Taiwan, Republic of China, 2005.

57. Li Yang, Raimund K. Ege and Huiqun Yu, Modeling and Verifying Mediation Framework. The *10th IEEE International Conference on the Engineering of Complex Computer Systems (ICECCS'05),* Shanghai, China.

58. Huiqun Yu, Xudong He, Li Yang, Secure Software Architecture Design by Aspect Orientation. *The 10th IEEE International Conference on the Engineering of Complex Computer Systems (ICECCS2005)*, Shanghai, China, June, 2005.

59. Huiqun Yu, Li Yang, Xudong He, Formal Aspect-Oriented Modeling and Analysis by AspectZ, *Software Engineering and Knowledge Engineering (SEKE'05)*, Taipei, Taiwan, Republic of China, 2005.

60. Li Yang, Raimund K. Ege, and Huiqun Yu. Security specification and enforcement in heterogeneous databases. *The 20th Annual ACM Symposium on Applied Computing (SAC'05), Computer Security Track*, Santa Fe, New Mexico, March, 2005.

61. Li Yang, Raimund K. Ege, and Huiqun Yu. Mediation framework modeling and verification (Abstract). *The 20th Annual ACM Symposium on Applied Computing (SAC'05), Software Engineering Trac*k, Santa Fe, New Mexico, March, 2005.

62. Qasem Kharma, Raimund K. Ege, Onyeka Ezenwoye, Li Yang. Data Integration in a Three-Layer Mediation Framework. IEEE SoutheastCon 2005 Conference, Fort Lauderdale, FL, April, 2005.

63. Onyeka Ezenwoye, Raimund K. Ege, Qasem Kharma, Li Yang, Shakil Siddique. Electing a Global Mediator in A Three-Layer Mediation Architecture. *IEEE SoutheastCon 2005 Conference*, Fort Lauderdale, FL, April, 2005.

64. Li Yang and Raimund K. Ege. A role-based access control model for information mediation *The 2004 IEEE International Conference on Information Reuse and Integration (IEEE IRI'04)*, Las Vegas, NV, pages 277-282, 2004.

65. Li Yang, Raimund K. Ege, and Huiqun Yu. Enhancing mediation security by aspect-oriented approach. *Software Engineering and Knowledge Engineering (SEKE'04)*, Banff, Alberta, Canada, pages 155-160, June 2004.

66. Raimund K. Ege, Li Yang, Qasem Kharma, and Xudong Ni. Three-layered mediator architecture based on DHT. *Proceedings of International Symposium on Parallel Architectures, Algorithms, and Networks Conference (I-SPAN'04)*, IEEE Computer Society Press, Hong Kong, May 2004.

67. Li Yang and Raimund K. Ege. Modeling and verification of real-time mediation systems. *Advanced Simulation Technologies Conference (ASTC'04)*, Arlington, Virginia, pages 61-68, April 2004.

PROFESSIONAL EXPERIENCES AND SERVICES

2017-2018 Faculty Search Committee in Engineering Management and Technology, Computer Science and Engineering

2016-2017 Faculty Search Committee in Chemical Engineering, Computer Science and Engineering

2017 NSF Panelist

2015 Dean's search committee

2014 – Present: Editor-in-Chief of International Journal of Information Security and Privacy (IJISP)

2014 – 2015: Think/Achieve Advisory Board at UTC

2014 - 2015: Committee on the UTC Strategic Plan 2008-2013

2014 - 2015: Committee on IT budget planning

2014-2015: Memorandum of Understanding for a Coordinated Graduate Computer Science and

Engineering Degree Program between The University of Tennessee at Chattanooga And East China University of Science and Technology, and Shanghai Institute Technology

2013: Advisory Board of Women in Cyber Security

2012: NSF Panelist

2007, 2015: Dean's search committee, College of Engineering and Computer Science, UTC

2005 - Present: Master Thesis Committee, University of Tennessee at Chattanooga (UTC)

2008-2012: Graduate Council

2008-2012: Graduate Curriculum Committee

2008-2014: University Institutional Review Board

2007-2011: UTC Faculty Senate

2007: NSF Panelist

2006, 2007, 2010, 2012, 2013: Reviewers of IEEE FIE, CISSE, SREC, ACM MSE, etc.

2001-2005: Graduate teaching and research assistant at Florida International University

MENTORING EXPERIENCES

- Advise master thesis on "Social Media Mining" by Andy Duncan, undergoing
- Advise graduate project on "Android Encryption" by Brandon Davidoff, graduated
- Advise master thesis on "Covert Channel on the Android Platform" by Wade Gasior
- Advised master thesis on "Multistage Attack Detection and Attacker Behavior Analysis System for Network Administrators" by Rajeshwar Katipally
- Advise master thesis on "Alerts Visualization and Multi Stage Attack Detection System" by Swetha Dasireddy
- Advised graduate project on "Emerging Infectious Disease: A Computational Multi-agent Model" by Alexander Shapiro
- Advised master thesis on "Fair Electronic Exchange by Biometrics" by Harkeerat Bedi
- Advise master thesis on "Fine-Grained Reputation-based Routing in Wireless Ad- hoc Networks" by Alma Cemerlic
- Advised graduate project titled as "LDA based Dark Web Analysis" by Feiqiong Liu
- Advised graduate project titled as "Integrate Trust into Usage Control in File Sharing" by "Chang Phuong"

CURRICULUM DEVELOPMENT AND ACCREDITATION EXPERIENCES

2015: Led development of new concentration in Computer Science with Ph.D. in Computational Science, and courses required in the program

2014: Developed new concentration on Data Science in M.S. in Computer Science, and its associated courses at UTC

2014 - 2021: Center of Academic Excellence-Information Assurance/Cyber Defense (CAE-IA/CD) from NSA and DHS, http://www.utc.edu/Research/Cisa/

2013: Led review from Tennessee Higher Education Commission (THEC) for the graduate program in the Computer Science and Engineering, received highest mark in all categories

2011: Developed new courses related to Data Science undergraduate and graduate concentrations

2009, 2010, 2013: Participated self-study of ABET accreditation of UTC computer science program, received 6-year accreditation

2008-2013: Center of Academic Excellence-Information Assurance Education (CAE-IAE) from NSA and DHS, http://www.utc.edu/Research/Cisa/

2007: Developed new concentration in Information Security and Assurance (ISA) in M.S. in Computer Science, and its associated courses at UTC

2006: Developed new concentration on Information Security and Assurance (ISA) in B.S. in Computer Science, and its associated courses at UTC

CLASSES TAUGHT

- CPSC 1110 Data Structures and Problem Design
- CPSC 2800 Introduction to Operating System
- CPSC 3600 Principles of Information Security and Assurance
- CPSC 4550 Computer Networks
- CPSC 4600/5600 Biometrics and Cryptography
- CPSC 4610/5610 Information Security Management
- CPSC 4620 Computer Network Security
- CPSC 4660/5660 System Vulnerability Analysis and Auditing
- CPSC 4670/5670 Database Security and Auditing
- CPSC 4900 Software Engineering
- CPSC 4910 Senior Capstone Project
- CPSC 4999/5910 Computer Gaming
- CPSC 5230 Business Intelligence and Decision Making
- CPSC 5550 Client-Server Systems
- CPSC 5800 Advanced System Software
- CPSC 5900 Graduate Project Course
- CPSC 5920 Summer Internship
- CPSC 5999 Master Thesis

SERVICES AND SOCIAL ACTIVITIES

- Server as IEEE FIE reviewer, 2013
- Serve as CISSE reviewer, 2012, 2015
- Serve as Panelist of NSF CSR, April 2012.
- Serve Panelist of NSF CCLI Phase1, July 12th-13th 2007.
- Serve Master Thesis Defense Committee, 2007 - present.
- Serve on University Institutional Review Board, 2008 – present
- Serve on Graduate Curriculum Committee, 2008 – present
- Serve on Graduate Council, 2008-present
- Serve on Dean’s search committee, 2007-2008
- Serve on the University Research Committee, 2007-2008
- Serve on Faculty Senate as a representative of CECS, 2007-2009
- Serve on CPSC Curriculum Committee, 2005-present

PRESENTATIONS (selected)

- Presented in IEEE HASE conference in January 2016.
- NSF Showcase in SIGCSE conferences in 2014, 2016
- ACM SIGCSE, Denver, Colorado, CO, 2014.
- Presented Authentic Learning of Mobile Security with Case Studies, Frontiers in Education Conference (FIE), Oklahoma City, OK, October 2013.
- Presented Teaching Business Analytics, Frontiers in Education Conference (FIE), Oklahoma City, OK, October 2013.
- Presented Android-Based Mobile Sensory System Labware for Embedded System Education, IEEE International Conference on Advanced Learning Technologies (ICALT), Beijing, China, July 2013.
- Presented Enhance Computer Networks Learning with Hands-on Mobile Device Based Labware, ACM Technical Symposium on Computer Science Education (SIGCSE), March 2013.
- Presented Learning Mobile Security with Android Security Labware, Proceedings of the ACM Technical Symposium on Computer Science Education (SIGCSE), March 2013.
- Presented Exploring Covert Channel in Android Platform, Cyber Security Conference, Washington D.C., December, 2012
- Presented Teaching Cryptography Using Hands-on Labs, poster, The 43rd ACM Technical Symposium on Computer Science Education (SIGCSE), Raleigh, NC, March, 2012.
- Presented Covert Channel in Smart Phones, Work in Progress (WiP), The 27th Annual Computer Security Applications Conference (ACSAC), Orlando, FL, December, 2011.
- Presented Attacker Behavior Analysis in Multi-stage Attack Detection, *the Cyber Security and Information Intelligence Research Workshop*, Oak Ridge, TN, 2011.
- Presented Teaching Cryptography through Hands-on Learning, *the 15th Colloquium for Information Systems Security Education (CISSE)*, 2011.
- Presented Integrating Dirichlet Reputation into Usage Control, *the Cyber Security and Information Intelligence Research Workshop*, Oak Ridge, TN 2009.
- Presented Biometrics based Fair Electronic Exchange, *the Cyber Security and Information Intelligence Research Workshop*, Oak Ridge, TN 2009.
- Presented Discovering Latent Topics from Dark Websites, *IEEE Symposium on Computational Intelligence in Cyber Security*, April 2009.
- Presented DoS Network Intrusion Detection through Multi-layer Features, *IEEE Symposium on Computational Intelligence in Cyber Security*, April 2009.
- Presented, Teaching Database Security and Auditing, *the 40th ACM Technical Symposium on Computer Science Education (SIGCSE)*, Chattanooga TN, March 2009
- Presented Biometrics Education with Hands-on Labs, *ACM Southeast Conference*, March 2008.
- Presented "Fine-Grained Reputation-based Routing in Wireless Ad Hoc Networks", in *IEEE International Conference on Intelligence and Security Informatics*, New Brunswick, NY, May 2007.

Joseph Kizza

PROFESSIONAL PREPARATION

Makerere University, Math-Computer Science, B.S. 1975
California State University, Sacramento, CA, Engineering (Computer Science), M.E. 1980
The University of Toledo, Toledo, OH, Mathematics, M.S. 1986
The University of Nebraska, Lincoln, NE, Computer Science, Ph.D. 1990

APPOINTMENTS

2009 – present	Professor and Head, Department of Computer Science and Engineering, University of Tennessee at Chattanooga, Chattanooga, TN
2002 – 2009	Professor and Director, UTC InfoSec Center, University of Tennessee at Chattanooga, Chattanooga, TN
1997 - 2002	Associate Professor, University of Tennessee at Chattanooga, Chattanooga, TN
1989 - 1997	Assistant Professor, University of Tennessee at Chattanooga, Chattanooga, TN
1995	Visiting Professor, University of East London, England

AWARDS

- 2007 CHOICE OUTSTANDING ACADEMIC TITLE: Computer Network Security and Cyber Ethics, 2d ed., McFarland Publishers, 2006. 223pp. soft-cover ISBN 978-0-7864-2595-2
- Best Engineering and Computer Science Researcher, UTC, 2006.
- Outstanding Computer Science Teaching Award, UTC, 2005.
- Outstanding Scholarly Contribution Award - from the International Institute for Advanced Studies in Systems Research and Cybernetics (IIAS), Germany. The award is given for outstanding scholarly research and educational work and for providing an exemplary contribution to the integration of engineering and social issues- 2004.
- Fulbright Scholar 2003-2004 to Uganda at Mbarara University of Science and Technology.
- 2002 Choice "Outstanding Academic Title" award for Computer Network Security and CyberEthics. McFarland Publishers, Inc., Jefferson City, NC, and London, UK, 2002.

INTERNATIONAL SERVICE

- Research Advisor to Local Governance and ICTs Research Network for Africa (LOG-IN Africa), an IDRC funded research network covering 10 African countries 2005-2010.
- Informatics Expert for the United Nations Scientific and Cultural Organization (UNESCO), 1994 - present
- Editor –in-Chief for the International Journal of Computing and ICT Research (IJCIR)
- Member Editorial Board:
    - International Journal of Computing and ICT Research (IJCIR) – Editor-in-Chief
    - African Journal of Science, Technology, Innovation and Development.
    - International Journal of Emerging Mechanical Engineering Technology
    - The International Journal of Cyber Ethics in Education (IJCEE).
    - The African Journal of Information and Communication
    - African Journal of Science, Technology, Innovation, and Development.
    - International Cyber crimes Journal Society of Productivity Enhancements (ISPE)
    - International Journal of Information Science (IJIS)
    - The International Journal of Cyber Ethics in Education (IJCEE).

HONORARY AND PROFESSIONAL SOCIETY MEMBERSHIPS

- Chapter Chair, ACM Mid-Southeast Chapter
- Association of Computing Machinery (ACM)
- International Association of Mathematics and Computer Modeling (IAMC)
- Association of Computing in Small Colleges (ACSC)
- The Association of Management (AM)
- International Federation of Information Professionals (IFIP)

INVITED PRESENTATIONS

- Keynote: Mobile Money Technology and the fast Disappearing African Digital Divide, AMMREC, Africa Mobile Money Research, 2012. 1st Africa Mobile Money Research International Conference, Kenya School of Monetary Studies, 2-4 April, 2012.Nairobi, Kenya.
- Keynote: "(Inter)net Neutrality: Your Voice Matters", at the 5th Annual International Conference on Computing and ICT Research, - SREC2009
- Keynote: "Implementing Security in Sensor Networks", at the 4th Annual International Conference on Computing and ICT Research, - SREC2008
- Keynote: "The Diminishing Private Network Security Perimeter Defense", at the 3rd Annual International Conference on Computing and ICT Research, - SREC2007.
- "Bare Naked: Emanation, Transmission and Theft of Information" Chattanooga Engineers' Club. Chattanooga, TN. October 2, 2006.
- **Keynote: "Bridging Africa's Digital Divide: Building Sustainable ICT Infrastructures" at the 2nd Annual International Conference on Computing and ICT Research, - SREC2006.**
- "Technology and Academic Dishonesty", University of Torku –Finland (IFIP), June 26-28, 2005.
- "The Myth of Privacy: Your Net My Net and Other Privacy Tales", Southern Methodist University, Collegedale, TN, October 7, 2004.
- "The Limits of Morality in Cyberspace (?): Legislating a Common Morality in Cyberspace" 15th International Conference on Systems Research, Informatics and Cybernetics, July 28 to August 2, 2003 in Baden-Baden, Germany.
- "Efforts to Define and Uphold Common Morality in Cyberspace" at the International Conference of Moral Science, The Institute of Moralogy, August 2 – 9, 2002, Kashiwa, Japan.
- "Computers, Ethics, and Decision Making: Global Perspectives" at Erasmus University,
- July 1-3,1995, Rotterdam, The Netherlands.
- "The Social Effects of the Computer Revolution: Where do we go from here?" at The
- University of East London, June 18-19, 1995, London, England.
- "Information Ethics" at The University of Nebraska-Lincoln, May, 1995.

GRANTS (most recent)

- NSF CyberCorps: Strengthening the National Cyber Security Workforce (Co-PI; Li Yang (Lead PI), awarded, $1,522,456. 2017-2021
- NSF SFS, Capacity Building in Mobile Security Through Curriculum and Faculty Development Li Yang (Lead-PI), Joseph Kizza, Kai Qian, Prabir Bhattacharya and Fan Wu, #1241651, $209,981, awarded, 2012-2015.
- NSF S-STEM, Making Opportunities for Computer Science and Computer Engineering Students (MOCS) Li Yang, Joseph Kizza, Kathy Winters, Mina Sartipi, Jack Thompson), $577,964, awarded.
- NSF SFS, Collaborative Project: Developing Faculty Expertise in Information Assurance through Case Studies and Hands-on Experiences, Li Yang, Joseph Kizza and Kathy Winters from UTC, Xiaohong Yuan from NC A&T SU, and Bill Chu from UNC Charlotte) #1129444, $100,000, awarded, 2012-2013.
- NSF SFS, Capacity Building in Mobile Security Through Curriculum and Faculty Development, Li Yang, Li Yang, Joseph Kizza, Prabir Bhattacharya and Fan Wu, #1241651, $209,981, awarded, 2012-2015.
- NSF grant entitled "NSF CNS (Award #: 1229213): Acquisition of HPC-B: A High Performance Computational Infrastructure for Biomedical Informatics Research", $305,494, duration: 09/01/2012-08/31/2015, Joseph Kizza (Lead-PI), Yu Cao and Craig Tanis.

JOURNAL PUBLICATIONS (most recent)

- The Straggling African University Needs a Critical Partner to Attain Its Place on the World Stage – Its Government, Vol. 8, Issue 2, pp 6-9, December 2014. http://www.ijcir.org/volume8-number2/

- Investigating the Role of MOOCs in the African Educational and Development Objectives, Vol. 8, Issue 1, pp 6- 9, June 2014. http://www.ijcir.org/volume8-number1/.
- Africa's Indigenous Technologies Making Footprint on the World Stage, Vol. 7, Issue 1, pp 6-11, June 2013. http://www.ijcir.org/volume6-number1/
- Investigating the Role of MOOCs in the African Educational and Development Objectives – A Synopsis, Vol. 7, Issue 2, pp 6- 8, December 2013. http://www.ijcir.org/volume6-number2/.
- Africa Can Greatly Benefit from Virtualization Technology – Part 1, Vol. 6, Issue 1, pp 6-10, June 2012. http://www.ijcir.org/volume6-number1/
- Africa Can Greatly Benefit from Virtualization Technology – Part II, Vol. 6, Issue 2, pp 6- 8, December 2012. http://www.ijcir.org/volume6-number2/.
- J. M. Kizza "Africa Can Greatly Benefit from Virtualization Technology" – Part 1, Vol. 6, Issue 1, pp 6-10, June 2012. http://www.ijcir.org/volume6-number1/
- J. M. Kizza, "Africa Can Greatly Benefit from Virtualization Technology" – Part II, Vol. 6, Issue 2, pp 6-8, December 2012. http://www.ijcir.org/volume6-number2/.
- J. M. KizzaTeaching Cryptography Using Hands-on Labs, poster(with Li Yang, Andy Wang and C. H. Chen), The 43rd ACM Technical Symposium on Computer Science Education (SIGCSE), Raleigh, NC, March, 2012.
- J.M. Kizza "Africa Can Greatly Benefit From Cloud Computing and Data Center Technologies – Part I". *International Journal of Computing and ICT Research*, Vol. 5, Issue 1, pp. 7-9. http://www.ijcir.org/volume 5-number1/article1.pdf.
- J.M. Kizza "Building a Strong Undergraduate Research Culture in African Universities.", *International Journal of Computing and ICT Research*, Vol. 5, No. 2, pp. 6-10. http://www.ijcir.org/volume5-number2 /article1.pdf
- J.M. Kizza "After the 7th International Conference of Computing and ICT Research". *International Journal of Computing and ICT Research*, Special Issue Vol. 5, Special Issue. pp 6. http://www.ijcir.org/Special-Issuevolume1-numbe1/article 1.pdf.
- J.M. Kizza . "Technology and Academic Dishonesty – Part I: A Focus on Students". International Journal of Computing and ICT Research, Special Issue Vol. 3, No. 1, October 2009. pp 7-12.
- J.M. Kizza . "Technology and Academic Dishonesty – Part II: A Focus on Academicians and Other Researchers**".** International Journal of Computing and ICT Research, Vol. 3, No. 2, October 2009. pp 7-13.
- J.M. Kizza. "Building the African ICT Infrastructure for Development: The Role of the African University- Part I". International Journal of Computing and ICT Research, Special Issue Vol. 3, No. 1, June 2009. pp 7-9.
- J.M. Kizza. "A Need for an African Academy for Information Communication Technologies (ICTs)". International Journal of Computing and ICT Research, Vol. 2, No. 2, October 2008. pp 7-9.
- J. M. Kizza. "A Method for Verifying Rule-Based Knowledge-Bases**".** Mathematical Modeling and Scientific Computing, vol. 3, sec. A, 1994**.**
- J. M. Kizza. "Legislate or Teach Information Ethics". Association of Management Eleventh Annual Conference Proceedings. Atlanta, GA., August 6 - 9, 1993.
- J.M. Kizza. "A Method for Verifying Rule-Based Knowledge-Bases". Ninth Intentional
- Conference on Mathematical and Computer Modeling Proceeding . Berkeley, CA. July, 1993.
- J. M. Kizza. "Modeling Techniques for Analyzing Complex Systems". Mathematical Modeling and Scientific Computing, vol. 2, sec. A, 1993.

BOOK CHAPTERS

- Joseph Kizza, Li Yang, "Social History of Computing and Online Social Communities", the *Encyclopedia of Social Network Analysis and Mining* (ESNAM), 2013.
- Joseph Kizza, Li Yang, "Is the Cloud the Future of Computing?", *Security, Trust, and Regulatory Aspects of Cloud Computing in Business Environments*, 2013.
- J. M. Kizza. "The History Hacking." In James Ciment, Editor, *An Encyclopedia on Social Issues in America*. Vol.2,. Sharpe Reference, 2006.

- J.M. Kizza and Jackie Ssanyu. " Workplace Surveillance". In *Electronic Monitoring in the Workplace: Controversies and Solutions* by John Weckert. Idea Group Inc. Publishers, Hershey, PA, 2005.
- J. M. Kizza. "Global ICT and the Digital Divide: Creating a Sustainable Infrastructure and Positive Outcomes to Narrow the Gap". In *The World in the Information Age: Challenges and Opportunities*" published in UK.
- J. M. Kizza, "Internet Convergence and Technical Control". In Jacques Berleur and Diane Whitehouse (eds.) *Governance of the Internet: Ethical Point of View*. Chapman and Hill. London, UK, 1999.
- J. M. Kizza, "Ethics in the Computer Age". In Allen Kent and James G. Williams (eds.) *Encyclopedia of Computer Science and Technology*, vol. 36. Marcel Dekker, Inc. New York, NY, 1997.
- J. M. Kizza. "Much A Do About Nothing: The Internet Dream". In Jacques Berleur and Diane Whitehouse (eds.) *Ethical Global Information Society: Culture and Democracy Revisited*. Chapman and Hill. London, UK, 1997.
- J. M. Kizza, "A new lower bound to the number of n-ominoes". In M. Rahman (ed.) *Ocean Waves Mechanics, Computational Fluid Dynamics, and Mathematical Modeling*. Computational Mechanics Publication. Southampton, U.K, 1990.

BOOKS (J. M. Kizza)

- *Guide to Computer Network Secu*rity – 4th Edition Springer - Hardcover (forthcoming)
- *Guide to Computer Network Security*– 4th Edition - Ebook Edition (forthcoming)
- *Guide to Computer Network Security* – 3rd Edition Springer - Persian (forthcoming)
- *Ethics in Computing: A Module*, Springer, 2016 – Hardcover.
- *Ethics in Computing: Module, Springer*, 2016. E-Edition.
- *Guide to Computer Network Security* – 3rd Edition Springer - Hardcover,
- *Guide to Computer Network Security*– 3rd Edition - Ebook Edition
- *Computer Network Security and Cyber Ethics* – 4th Edition - Hardcover,
- *Computer Network Security and Cyber Ethics* – 4th Edition - Ebook Edition
- *Guide to Computer Network Security* – 2nd Edition – Hardcover,
- *Guide to Computer Network Security* – 1st Edition – Chinese.
- *Social and Ethical Issues in the Information Age* – 5th Edition - Hardcover,
- *Social and Ethical Issues in the Information Age* – 5th Edition - Archived Edition
- *Guide to Computer Network Security* – 2nd Edition – Hardcover,
- *Guide to Computer Network Security* – 1st Edition – Chinese.
- *Social and Ethical Issues in the Informance A*ge – 5th Edition - Hardcover,
- *Social and Ethical Issues in the Informance Age* – 5th Edition - Archived Edition
- *Computer Network Security and CyberEthics,* Third Edition*. McFarland & Company* (appearing Fall 2010).
- *Ethical and Social Issues in the Information Age*. Fourth Edition, Springer-Verlag, London,
- *Special Topics in Computing and ICT Research Strengthening the Role of ICT in Development*, Volume V. 2009. Kathy Lynch, Ravi Nath, Janet Aisbett, Phoha Vir (Editors). Fountain Publishers, Kampala
- *Guide to Computer Network Security*. Springer-Verlag, 2009. London, UK
- *Special Topics in Computing and ICT Research: Strengthening the Role of ICT in Development*. Fountain Publishers, Kampala, Uganda, 2008.
- *Strengthening the Role of ICT in Development*. Fountain Publishers, Kampala, Uganda, 2007.
- *Special Topics in Computing and ICT Research: Advances in Systems Modelling and ICT Applications.* Fountain Publishers, Kampala, Uganda. 2006*.*
- *Securing the Information Infrastructure*, IGI Global, Hershey, PA, 2008.
- *Ethical and Social Issues in the Information Age*. Third Edition, Springer-Verlag, New York, 2007.
- *Computer Network Security and CyberEthics,* Second Edition*. McFarland & Company, 2006*.
- *Computer Network Security*. New York: Springer-Verlag, 2005.
- *Ethical and Social Issues in the Information Age*. Second Edition, Springer-Verlag, New York, 2002.
- *Computer Network Security and CyberEthics*. McFarland Publishers, Inc., Jefferson City, NC, and London, UK, 2002.

- *Ethical and Social Issues in the Information Age*. Japanese translation. Springer-Verlag GmbH & Co. KG through The English Agency, (Japan) Ltd.. New York, 2001.
- *Civilizing the Internet: Global Concerns and Efforts Towards Regulation*. McFarland Publishers, Inc., Jefferson City, NC, and London, UK, 1998.
- *Ethical and Social Issues in the Information Age*. Springer-Verlag. New York, 1997.
- *Social and Ethical Effects of the Computer Revolution*. McFarland Publishers Inc. Jefferson City, North Carolina, 1996.
- *Ethics in the Computer Age Conference Proceedings*. ACM Press. New York, 1995.

CONFERENCES / MEETINGS ORGANIZED

- Annual ACM Mid-Southeast Conference, Gatlinburg, TN 2004- 6.
- "European Philosophical and Computer Ethics" Conference at Rotterdam, The Netherlands, January/February 1997, with Jeroen vanden Hoven, Erasmus University and David Preston, University of East London.
- "Ethics in the Computer Age". Lecture Series 1994-95 at the University of Tennessee at Chattanooga.
- "Ethics in the Computer Age International Conference" in collaboration with ACM, November, 1994, Gatlinburg, Tennessee.
- "Ethics in the Computer Age". Conference, November, 1992 at the University of Tennessee at Chattanooga.
- "Ethics in the Computer Age". Conference, November 15, 1991 at the University of Tennessee at Chattanooga.

WORKSHOPS CONDUCTED

- Computers Forensics, Summer Workshop at UTC, 2005
- Writing and Research Workshop. Institute of Computer Science, Makerere University, Uganda. March 15 – 29, 2004.
- Computers, Ethics, and Decision Making: Global Perspectives - conducted at Erasmus University, Rotterdam, The Netherlands, July 1-3,1995.
- The Social Effects of the Computer Revolution: Where do we go from here? - conducted at The University of East London, London, England, June 18-19, 1995.
- Writing and Research Workshop. Institute of Computer Science, Makerere University, Uganda. March 15 – 29, 2004.

Yu (Hugh) LIANG,
B.Eng (CS), M.Eng (CS), Ph.D (CS), Ph.D (Appl. Math).

Address: The University of Tennessee at Chattanooga
College of Engineering and Computer Science
Department of Computer Science and Engineering
Dept. 2302 EMCS-314E
615 McCallie Ave., Chattanooga, TN 37403-2598, USA
Phone: (423) 425-4351
Fax: (423) 425-5442
Email: yu-liang@utc.edu ; hughliang@gmail.com

Dr. Yu Liang is currently working at the Department of Computer Science and Engineering of University of Tennessee at Chattanooga as an Associate Professor. His funded research projects cover the following areas: big-data and cloud computing, modeling and simulation, high-performance scientific and engineering computing, numerical linear algebra, the processing and analytics of large-scale sensory data, and computational mechanics. His research work has appeared in various prestigious journals, book or book chapters, and refereed conference, workshop, and symposium proceedings. He owns one technical pattern that is registered at Univ. of Tennessee Research Foundation (UTRF). Dr. Liang is serving in the International Journal of Security Technology for Smart Device (IJSTSD), Journal of Mathematical Research and Applications (JMRA), and Current Advances in Mathematics (CAM) as an editorial board member.

IMPORT WEBPAGES

- **GoogleScholar**: http://scholar.google.com/citations?user=SfksDEYAAAAJ&hl=en
- **UTC Webpage:** http://www.utc.edu/faculty/yu-liang

EDUCATION

- **Ph.D. / Appl. Math** (8/98-7/01, 09/05), Univ. of Ulster (UK), directed by J. Weston, M. Szularz and D. Bustard. Thesis: *The Use of Parallel Polynomial Preconditioner in the Solution of Systems of Linear Equations*.
- **Ph.D. / Computer Science** (9/95-7/98, 07/98), Chinese Academy of Sciences, directed by C. D. Han. Thesis: *Timing-sequence based Test of Parallel Program*.
- **M.Eng / Computer Science** (9/92-2/95, 02/95), Beijing University of Technology, directed by Y.W. Liang. Thesis: *Accelerate the Test-generation of the combinational circuit by taking advantages of the associated structural laws*.
- **B.Eng / Computer Science and Technology** (9/85-7/90, 07/90), Tsinghua University, directed by G.Z. Zhang. Thesis: *Design and Research on Network Interface*.

RESEARCH INTERESTS

Numerical linear algebra; modeling and simulation; data analytics; computational mechanics; parallel and distributed computing; big-data and cloud computing; sensor-oriented information processing and analysis; hyper-spectral image and video processing; fault-tolerance technique.

ACCOMPLISHMENTS

- One book and three book chapters in computational and computer science
- About seventy published peer-reviewed journal papers and conference proceeding papers
- Editorial board member of several peer-reviewed journals
- Review and division chair of international journal and conferences
- More than 40 government (NSF, U.S. Air-Force, U.S. NAVY, U.S. ARMY, China's National 863 Climbing Plan) and industry sponsored research projects
- Taught about twenty undergraduate- and graduate-level computer and mathematics courses

PROFESSIONAL EXPERIENCE

- **Associate Professor / Computer Science (08/13 – now, tenured in 2016),** Department of Computer Science and Engineering, University of Tennessee at Chattanooga.
- **Associate Professor /Computer Science** (04/13-08/13), Department of Mathematics and Computer Science, Central State University.
- Summer Faculty Fellow (05/2012-08/2012), Sensor Directorate, U.S. Air Force Office of Scientific Research.
- Summer Faculty Fellow (05/2011-08/2011), Sensor Directorate, U.S. Air Force Office of Scientific Research.
- **Assistant Professor** /Computer Science (08/07-04/13, tenured in August 2012), Department of Mathematics and Computer Science, Central State University.
- **Visiting Assistant Professor** /Computer Science (08/06-08/07), Department of Computer and Software Engineering, Embry-Riddle Aeronautical University.
- **Research Scientist** / Computational Science (05/05-08/06), Center for Advanced Materials and Smart Structures(CAMSS), North Carolina A&T State University.
- **PostDoc / Scientific Computing** (08/02-05/05), Army High-performance Computing Research Center, University of Minnesota**.**
- **PostDoc / Scientific Computing** (08/01-08/02), Department of Computer Science, University of Minnesota.

RESEARCH GRANT

- *US Ignite: Collaborative Research: Focus Area 1: Fiber Network for Mapping, Monitoring and Managing Underground Urban Infrastructure*, Co-PI, National Science Foundation (#1647175), UTC: $299,884, 01/01/2017 - 12/31/2019.
- *Multiscale Serviceability Analysis and Assessment of Urban Infrastructure,* Co-PI, Tennessee Higher Education Commission's Center of Excellence in Applied Computational Science and Engineering (CEACSE), $95,610, 07/01/2016 - 06/30/2017.
- *I-Math: An Interdisciplinary Math Training Platform***, Co-PI,** National Science Foundation: Mathematical and Physical Sciences (NSF Proposal Number: 1520672), **$500,000**, 09/01/2015-08/31/2018.
- *Virtual TaiJi System: an Innovative Rehabilitation Strategy*, **PI**, UTC CRISP, **$8,000**, 09/01/2015-08/31/2016.
- *Collaborative: TUES: Software Defined Radio Laboratory Platform for Enhancing Undergraduate Communication and Networking Curricula*, **PI**, National Science Foundation: DUE Program (NSF Proposal Number: DUE 1323340), **$100K**, 09/01/2013-08/31/2016.
- *Application of Sensor Network in Knowledge Discovery***, Co-PI**, National Science Foundation: Supplement Program **(**NSF Proposal Number: DUE 1240734), **$99,996**, 09/01/2015-08/31/2016.

- *A Design Proposal for the Center of Cyber Sensor Networks for Human and Environmental Applications*, **Co-PI**, National Science Foundation: Solicited Program (NSF Proposal Number: 1240734), **$596,670**, 09/01/2013-08/31/2015.
- *Computational Methods in Fracture Mechanics*, **PI**, Minority Leader Program of U.S. Air Force (POC: Dr. Gregory A Schoeppner; Contract No: FA8650-05-D-1912), **$75K/year**, 09/01/2013-08/31/2018.
- *A Self-Optimization and Cooperative Control Sensor Network and Its Application in Sensor-oriented Problems*, **PI**, Minority Leader Program of U.S. Air Force (POC: Mr. Darrell Barker), **$100K**, 09/01/2013/08/31/2014.
- *Enabling Technology in Computational Material Science*, **PI**, Minority Leader Program of U.S. Air Force (POC: Dr. Gregory A Schoeppner, Contract No: FA8650-05-D-1912), **$75K**, 09/01/2012-08/31/2013.
- *High Performance Computing for Composite Manufacturing Process Modeling*, **PI**, Minority Leader Program of U.S. Air Force (POC: Dr. Gregory A Schoeppner), **$45K**, 09/01/2011-08/31/2012.
- *Application of Analogous Fluid-Dynamics-in-Porous-Medium Model in Crowd Motion Analysis*, **PI**, Summer Faculty Fellowship Program (SFFP) of U.S. Air Force (POC: Mr. Darrell Barker), summer of 2012.
- *NSF RI: Large: Collaborative Research: A Robotic Network for Locating and Removing Invasive Carp from Inland Lakes*, **Co-PI**, National Science Foundation (NSF Proposal Number: 1111542), $**292,832**, 07/01/2012-06/31/2016.
- *Electronic Sandbox System, A State-of-Art Infrastructure for Layered Sensing Application*, **PI**, Summer Faculty Fellowship Program (SFFP) of U.S. Air Force (POC: Mr. Darrell Barker), summer of 2012.
- *Multiscale Motion Analysis*, **PI**, Minority Leader Program of U.S. Air Force (POC: Ms. Olga Mendoza-Schrock), **$50K**, 09/01/2011-08/31/2013.
- *Predict Enemy's Intention according to the Infrared Persistent Surveillance Data*, **Co-PI**, Minority Leader Program of Air Force (POC: Ms. Olga Mendoza-Schrock), **$25K**, 09/01/2010-08/31/2011.
- *Real-Time Detection of Improvised Explosive Device Using Hyperspectral Image Processing Techniques, **Co-PI**, U.S. Air Force* (POC: Ms. Olga Mendoza-Schrock), **$50K**, 09/01/2009-08/31/2010.
- *Application of Hyperspectral Image Analysis for the GIS*, **Primary Researcher** QBase Inc, **$100K**, 09/01/2009-08/31/2010.
- *Preprocess and Post-process for the Modeling/Simulation of Composite Structure* (Contract No: N00014-07-C-0442), **Voluntary Consultant,** Navel Research, **$118,718**, 09/01/2007-08/31/2009.
- *Fire Integrity in Advanced Ship Structures—Phase I (Contract No: N071-098-0648)*, Voluntary **Consultant,** DOD's small business Innovation Research (SBIR), **$100K**, 09/01/2007-08/31/2008.
- *Fire Integrity in Advanced Ship Structures—Phase II (Contract No: FA8650-07-C-5015)*, **Voluntary Consultant,** AF SBIR/STTR Solicitation 06.1, **$750K**, 09/01/2007-08/31/2009.

BOOK OR BOOK CHAPTERS

- **Y. Liang**, DL. Wu, D. Huston, G. R. Liu, Y. Li, CL. Gao, J. Ma, *Chapter 12: Civil Infrastructure Serviceability Evaluation Based on Big Data*, in "Guide to Big Data Application". Edited by S. Srinivasan. Springer Publishing. ISBN-13: 9783319538167, June 7th, 2017.
- **Y. Liang**, *The Use of Parallel Polynomial Preconditioners: In the Solution of Systems of Linear Equations*, ISBN-10: 3659344494, ISBN-13: 978-3659344497, LAP LAMBERT Academic Publishing.
- R. Mohan and **Y. Liang**, *Chapter 10: Tensile and Flexural Deformation of Nickel Nanowires via Molecular Dynamics Simulations*, Cutting Edge Nanotechnology. Edited by Dragica Vasileska. Intechweb.org, ISBN 978-953-7619-93-0, 2010.
- Y. Liang, Preface: An Introduction to UNIX System, 2004.

PATTERNS

- Zibin Guo, **Y. Liang**, DL. Wu, N. Fell, and A. Clark, "Virtual TaiJi System - An Innovative Modality for Rehabilitation", an invention disclosure has been submitted to University of Tennessee Research Foundation (UTRF, http://urtf.utc.edu) and received the UTRF file number designated above, 16051-02.

REPRESENTATIVE JOURNAL PAPERS

- **Y. Liang**, and Z. Shi, *A Hessian-Free Newton-Raphson Method for the Configuration of Physics Systems Featured by Numerically Asymmetric Force Field*, Mathematical and Computer Simulation, (Impact Factor: 1.225), February 2017, 1-23, DOI: 10.1016/j.matcom.2016.11.011.
- **Y. Liang**, D. Wu, G. Liu, Y. Li, Lani Gao, and W. Wu, *Big Data-enabled Multiscale Serviceability Analysis about Aging Bridges*, Digital Communications and Networks, August 2016, 97-107. DOI: 10.1016/j.dcan.2016.05.002.
- **Y. Liang** and C. Wu, *A HADOOP-Enabled Sensor-Oriented Information System for Knowledge Discovery about Target-of-interest*, Internet of things - special issue of FUEE scientific journal (Impact Factor: 0.460), Vol. 29, No. 3, March 2016, 437-450. DOI:10.2298/FUEE1603437L.
- **Y. Liang**, R. Kanapady, and L. T. Laurence, *Augmented FETI-DP Method Based on Polynomial Preconditioning*. Mathematical and Computer Simulation (Impact Factor: 1.225, Under Review).
- **Y. Liang**, C. Wu, and K. Kendricks, *A Hadoop-enabled Predictive Analytics about Carp Aggregation*, Journal of Computer Science and Information Technology, June 2015.
- **Y. Liang,** W. Melvin, S. I. Sritharan, S. Fernandes, and D. Barker, *A Crowd Motion Analysis Framework Based on Analog Heat-Transfer Model*, American Journal of Science and Engineering Vol 2, No. 1, 2013, pp. 33-43.
- **Y. Liang**, M. Szularz and L. T. Yang, *Finite-element-wise Domain Decomposition Iterative Solvers Based on Polynomial Preconditioning*, DOI: 10.1016/j.mcm.2012.11.017, Mathematical and Computer Modeling (Impact Factor: 1.346). Volume 58, Issues 1–2, July 2013, Pages 421-437
- R. Mohan, Y. Purohit, **Y. Liang**, *Deformation Behavior of Nanoscale Material Systems with Applications to Tensile, Flexural and Crack Propagation*, Journal of Computational and Theoretical Nanoscience (Impact Factor: 0.911), Volume 9, Number 5, May 2012, pp. 649-661(13). **DOI:** 10.1166/jctn.2012.2075.
- J. Zhang, **Y. Liang** and Y. Zhang, *Atomic-level protein structure refinement using fragment guided molecular dynamics conformation sampling*. Structure (Impact Factor: 6.347), 2011 Dec 7; 19(12):1784-95. DOI: 10.1016/j.str.2011.09.022.
- A. Saha, **Y. Liang,** and S. Kohles, *Biokinetic Mechanisms Linked With Musculoskeletal Health Disparities: Stochastic Models Applying Tikhonov's Theorem to Biomolecule Homeostasis*, Journal of Nanotechnology in Engineering and Medicine, May 2011, Vol.2/021004-1 – 9, DOI :10.1115/1.4003876.

- S. Kohles, **Y. Liang,** and A. Saha, *Cytoskeletal Strains in Modeled Optohydrodynamically Stressed Healthy and Diseased Biological Cells*, Journal of Biophysics (Impact Index: 3.632), Volume 2012, doi:10.1155/2012/830741.
- S. Kohles, **Y. Liang,** and A. Saha, *Volumetric Stress-Strain Analysis of Optohydrodynamically Suspended Biological Cells*, Journal of Biomedical Engineering, December 2010, Vol. 132, 1-7.
- J. Zhang, **Y. Liang**, J.Z. Yan and J. Z. Lou, *Study of the molecular weight dependence of glass transition temperature for amorphous poly (L-lactide) by molecular dynamics simulation*, Polymers (Impact Factor: 3.438), Volume 48, Issue 16, 27 July 2007, 4900-4905.
- **Y. Liang**, J. Weston and M. Szularz, *Generalized least-squares polynomial preconditioners for symmetric indefinite linear equations*. Parallel computing (Impact Factor: 1.693) 28(2): 323-341 (2002), doi: 10.1016/S0167-8191(01)00142-9.
- **Y. Liang**, S. Li, H. Zhang and C.D. Han, *Timing Sequence Testing for parallel Programs*, Journal of Computer Science and Technology (*Impact Factor : 0.656*), 84-95. Jan. 2000. DOI:10.1007/BF02951930.
- **Y. Liang**, J. K. Li, L. B. Zhang, Y. C. Li and H.Q. Lu, *ParCT: A Parallel C-Language Testing Tool*, Journal of Computer Research and Development (Impact Factor: 0.450), Vol.36, No.10, 1197-1201. Oct.1999.
- **Y. Liang**, S. Li, H. Zhang and C.D. Han, *Timing Sequence Testing for the Distributed Parallel Programs*, Journal of Computer Research and Development(Impact Factor: 0.450), Vol.36, No.9, 1062-1068. Sept.1999.
- **Y. Liang**, S. Li, H. Zhang and C.D. Han, *Research on the Coverage Ratio for the Timing Sequence Test of Parallel programs*, Journal of Computer Research and Development (Impact Factor: 0.450), Vol.36, No.2, 160-165. Feb. 1999.

SELECTED CONFERENCE PAPERS AND PRESENTATION

- C. Davis, D. Ledesma, R. Slaughter, D. Wu, Z. Guo, **Y. Liang**, "Kinetic Data Processing for Gesture Recognition", IEEE BigDataService 2018, March 26-29, Bamberg, Germany.
- D. Ledesma, C. Davis, R. Slaughter, D. Wu, Z. Guo, **Y. Liang**, "Kinetic Gesture Recognition and Choreography", IEEE BigDataService 2018, March 26-29, Bamberg, Germany.
- P. Zelgen, N. Alharbi, **Y. Liang** and D. Wu, "*Feature Normalization and Preprocessing of Kinematic Data for Gesture Recognition*", the Second IEEE/ACM Conference on Connected Health: Applications, Systems, and Engineering Technologies (CHASE 2017), July 17-19, Philadelphia, USA.
- N. Alharbi, P. Zeglen, **Y. Liang** and D. Wu, "*Extended-Kalman-Filter Preprocessing Technique for Gesture Recognition*", the Second IEEE/ACM Conference on Connected Health: Applications, Systems, and Engineering Technologies (CHASE 2017), July 17-19, Philadelphia, USA.
- **Y. Liang**, J. Ma, D. L. Wu, and J. Kizza, "*A Hadoop-enabled Multiscale Serviceability Analysis about Aging Bridges*", 95th TRB Annual Meeting, Bridge DAWG, 01/10-01/14//2016, Washington DC.
- **Y. Liang**, D. L. Wu, and J. Kizza, "*A Hadoop-enabled Multiscale Serviceability Analysis about Aging Bridges*", 95th TRB Annual Meeting, Bridge DAWG, 01/10-01/14//2016, Washington DC.
- **Y. Liang**, Z. B. Guo, D. L. Wu, N. Fell, and A. Clark, "*Virtual TaiJi System - An Innovative Modality for Rehabilitation*", Annual BSEC Conference at Oak Ridge National Laboratory Collaborative Biomedical Innovations, 08/25-27, 2015.
- **Y. Liang**, D. L. Wu, and L. Yang, "Introduction to Mobile Programming and Mobile OS", in NSF-funded workshop "Capacity Building in Mobile Security through Curriculum and Faculty Development, Tuskegee University, 07/31/2015.
- Y. Liang, "Application of Big-Data in Civil Engineering", the 7th Venture Week for International Elites in Suzhou, Suzhou, China, 07.13-07/20/2015.

- Y. Liang and D.L. Wu, and J. Kizza, "Big Data: Generation, Extraction and Application to Aging Bridges", Street Talk: Exploring Big Data & Analytics, First Annual Conference, Franklin TN, June 17-18, 2015.
- **Y. Liang** and C. Wu, "An *Agent-based Mathematical Model about Carp Aggregation* ", Proc. SPIE 9486, Advanced Environmental, Chemical, and Biological Sensing Technologies XII, 94860Q (May 13, 2015); doi:10.1117/12.2180323; http://dx.doi.org/10.1117/12.2180323.
- **Y. Liang** ; and C. Wu, *A Sensor-Oriented Information System Based on Hadoop Cluster*, ICOMP'14 - International Conference on Internet Computing and Big Data (July 21-24, 2014, USA) (Acceptance rate: 26%)
- **Y. Liang** ; Michael Henderson ; Shane Fernandes and Josh Sanderson, *Vehicle tracking and analysis within a city*, Proc. SPIE 8751, Machine Intelligence and Bio-inspired Computation: Theory and Applications VII, 87510F (June 3, 2013); doi:10.1117/12.2014561; http://dx.doi.org/10.1117/12.2014561.
- J. Sanderson, **Y. Liang**. *No-reference image quality measurement for low-resolution images* , Proc. SPIE 8744, Automatic Target Recognition XXIII, 874404 (June 3, 2013); doi:10.1117/12.2015014; http://dx.doi.org/10.1117/12.2015014 .
- S. Fernandes, **Y. Liang**. *Chipping and segmentation of target of interest from low-resolution electro-optical data*, Proc. SPIE 8744, Automatic Target Recognition XXIII, 87440R (June 3, 2013); doi:10.1117/12.2015972; http://dx.doi.org/10.1117/12.2015972.
- **Y. Liang,** W. Melvin, S. I. Sritharan, S. Fernandes, and D. Barker, CMA-*HT, a Crowd Motion Analysis Framework Based on Heat-transfer-analog Model*. *Proc. SPIE* 8402, Evolutionary and Bio-Inspired Computation: Theory and Applications VI, 84020J (May 1, 2012); doi:10.1117/12.919088.
- **Yu Liang,** S. Kohles**,** and A. Saha, *Cytoskeletal Strain Responses of Modeled Hydrodynamically Stressed Biological Cells*, proceeding of COMSOL 2010, Boston, October 7-9, 2010.
- **Y. Liang**, Z. Shi, S. I. Sritharan, and H. Wan, *Simulation of the Spread of Epidemic Disease Using Persistent Surveillance Data*, proceeding of COMSOL 2010, Boston, October 7-9, 2010.
- S. Fernandes, **Y. Liang**, S.I. Sritharan, X.Wei, and R. Kandiah, *Real Time Detection of Improvised Explosive Devices using Hyperspectral Image Analysis*, 2010 IEEE National Aerospace and Electronics Conference (NAECON 2010).
- **Y. Liang**, Haim Waisman, Jay Shi, Philip Liu and Jim Lua, *Pre-processing Toolkit for Three-Dimensional X-FEM*, 2008 IEEE National Aerospace and Electronics Conference (NAECON 2008), to be held in Dayton, Ohio, USA from July 16-18, 2008, page 265-272. Doi: 10.1109/NAECON.2008.4806557.
- **Y. Liang** and M. Szularz, *an Efficient Unconstrained Optimization Algorithm with Respect to Unsymmetric Force Field*, proceeding of Fourth International Conference of Applied Mathematics and Computing, Plovdiv, Bulgaria, August 12 - 18, 2007.
- **Y. Liang**, R. Kanapady and K. K Tamma, *Highly Scalable Finite-element-based Domain Decomposition Iterative Solvers with Polynomial Preconditioning*, in the proceedings of 2006 International Conference on Parallel Processing Workshops (ICPPW'06), 505-510. August 14-18, Columbus, Ohio.
- **Y. Liang** and R. Mohan, *Development and Applicability of Augmented FETI-DP Formulation for Stokes Type Flow Problems*, 7th World Congress on Computational Mechanics, Los Angeles, California, July 16 – 22, 2006.
- **Y. Liang** and R. Mohan, *Evaluation and Applicability of a Highly Scalable Finite Element Based Iterative Solver for Process Flow Modeling in Liquid Composite Molding*, 7th World Congress on Computational Mechanics, Los Angeles, California, July 16 – 22, 2006.
- **Y. Liang** and R. Mohan, *Tensile Deformation of Nickel Nanowires under Uniaxial Tension with High Strain Rates through Molecular Dynamics Simulations*, XXIII Southeastern Conference on Theoretical and Applied Mechanics, May 21-23, 2006. Puerto Rico.

- P. Chung and R. Namburu, U.S. Army Research Laboratory; R. Kalia, P. Vashishta and A. Nakano, University of Southern California; **Y. Liang** and R. Kanapady, Army High Performance Computing Research Center; J. Knap, M. Ortiz and R. Phillips, Caltech: *Scalable Quasi-continuum Software for Advanced Mixed Atomistic-Continuum Simulations of Material Behavior at the Nanoscale*, The 24th Army Science Conference (ASC 24), Orlando Florida, November 29-December 2, 2004.
- **Y. Liang**, R. Kanapady and P. Chung, Iterative Solution Technique for the Quasi-continuum Method, in proceedings of 2004 International Conference on Computational & Experimental Engineering and Sciences (ICCES'04), Madeira, Portugal, 26-29 July 2004.
- **Y. Liang**, R. Kanapady and K. K. Tamma, *A Highly Scalable Linear Solver for Finite Element-Based Domain Decomposition Problems*, Eleventh SIAM Conference on Parallel Processing for Scientific Computing (PP04).
- **Y. Liang**, J. Weston and M. Szularz: *Polynomial Preconditioning for Specially Structured Linear Systems of Equations*. Euro-Par 2001: 587-591. DOI: 10.1007/3-540-44681-8_84
- **Y. Liang**, J. Weston and M.Szularz, *Stability of Polynomial Preconditioning*, in Proceedings of ALGORITMY 2000, 15th Conference on Scientific Computing, A. Handlovicova, M.Komornikova, K.Mikula, and D.Sevcovic (Eds.), 264-273.
- **Y. Liang**, J. Weston, M. Szularz: *Generalized Least-squares Polynomial Preconditioner for Symmetric Indefinite Linear Equations*, Proceedings of PMAA 2000 (International Workshop on Parallel Matrix Algorithms and Applications) during 18-20 August 2000, 14, Neuchatel, Switzerland.
- J. K. Li, **Y. Liang**, Y.Q. Zhang and Y.C. Li, *PBLAS on Super-computer SR2201*, in proceeding of 1997 International Workshop on Computational Science and Engineering, Hefei, China.
- Y.Q. ZHANG, **Y. LIANG**, *ScaLAPACK on SR2201: Analysis and Testing*, 1997 International Workshop on Computational Science and Engineering (IWCSE'97), May 27--28, 1997, Hefei, China.

ACADEMIC MEMBERSHIP

- SPIE
- Sigma-Xi

RECENT PROFESSIONAL ACTIVITIES

- **Member of Editorial Board** and **Program Committee Member**, First International Workshop on Security Technology for Smart Device (STSD 2015), URL: http://interworkshop.org/STSD2015/ .
- **Member of Editorial Board**, International Journal of Security Technology for Smart Device (IJSTSD), URL: http://www.sersc.org/journals/IJSTSD/
- National Science Foundation (NSF) review panelist for Applied Mathematics program, and the 2015 NSF Graduate Research Fellowship Program (GRFP).
- **Member of Editorial Board**, Journal of Mathematical Research and Applications, URL: http://www.academicpub.org/jmra/ .
- **Panel Expert** for the Secondary Career-Technical Alignment Initiative (SCTAI), Ohio Board of Regents.
- **Technique Program Committee member** of the Embedded Computing and Systems Track, the 6th International Conference on Frontier of Computer Science and Technology (**FCST 2011**: http://trust.csu.edu.cn/conference/fcst2011/)
- **Symposium chairs** of the 10th International Conference on Algorithm and Architectures for Parallel Processing (2010) (http://cse.stfx.ca/~ica3pp2010/)

- **Publicity chair** of the international conference on 2008 High Performance Computing and Communications (HPCC-08), Dalian, China (http://hpcc08.dlut.edu.cn/).
- Member of International Editorial Board (IEB) of the special issue of Wireless Personal Communications (indexed by SCIE) on "Information Security and data protection in Future Generation Communication and Networking".
- **Reviewer** of Journal of Supercomputing (journal).
- **Reviewer** of Journal of Computational and Applied Mathematics.
- Committee member of Statewide Users Group (SUG) of Ohio Supercomputer Center (http://www.osc.edu).
- **Guest Editor/Reviewer** of Journal of Parallel and Distributed Computing.
- **Reviewer** of Supercomputing International Conference 2005 (SC'05), November 12-18 at the Washington State Convention and Trade Center, USA.
- **Reviewer** of Parallel Computing (journal).
- **Reviewer** / **Division Chair** for the 6th International Workshop on Parallel and Distributed Scientific and Engineering Computing (IPDPS-PDSEC05), April 4-8, 2005 in Denver, Colorado, USA.

TEACHING EXPERIENCE

- Have been teaching "Artificial Intelligence" (CPSC 4440), "Fundamental of Computer Science" (CPSC 1100/CPSC 5000), "Data-structure and Program Design" (CPSC 1110), "Algorithm Design and Analysis" (CPSC 5210), "Cloud Computing" (CPSC 4130/5130) at the Department of Computer Science and Engineering, University of Tennessee at Chattanooga, since fall 2013.
- Taught "Computer Science I" (CPS 1191), "Computer Science II" (CPS 1192), "Internet Web Essential" (CPS 2215), "Computer Architecture" (CPS 3340), "JAVA Programming" (CPS 3325), "Programming Languages" (CPS 3370), "Image Processing" (CPS 4425) at the Department of Mathematics and Computer Science, Central State University from fall 2007 to spring 2013.
- Taught "Java" (CS225), "Data Structure" (CS315), "Parallel Programming" (CS395) and "Discrete Mathematics" (CS222) in Department of Computer and Software Engineering, Embry-Riddle Aeronautical University from fall 2006 to summer 2007.
- Taught "Parallel Programming" and "Parallel Computer Architecture" in Computational Science and Engineering (CSE) and High Performance Computing (HPC) faculty training workshop (CSE-HPC Workshop), which was sponsored by Department of Defense (DOD), for faculty from under-represented minority serving institutions (MSI), Summer Semester, 2006.
- Taught "numerical analysis" (CS 345) in NC A&T State University, Fall semester, 2005.
- Undertook Teaching Assistant of courses "computer architecture", "logical programming", "mathematics for computing", "computer hardware and organization", "system analysis and design", "introduction to database systems", "object-oriented programming", "algorithm and data structures", "networks and data communication" and "software engineering", University of Ulster, 10/1998-7/2001.
- Taught course "Computer Architecture" as an Assistant Lecturer, Beijing Polytechnic University, 9/1993-7/1995.

INDUSTRIAL EMPLOYMENT EXPERIENCE

- Technique Director (part time), Beijing Long-Mark Computer Co., 7/1991-8/1995
- System Engineer (full time), Beijing Wire Communication Co., 8/1990-8/1992

HONORS

- College Faculty Leadership Award, Central State University, 2012.

- U.S. Air Force Summer Faculty Fellowship Program, 2012
- U.S. Air Force Summer Faculty Fellowship Program, 2011.
- Vice-Chancellor Scholarship of University of Ulster, 1998-2001.
- Oversea Research Scholarship of United Kingdom, 1998-2001.

Farah Kandah

CONTACT INFORMATION

University of Tennessee at Chattanooga
Computer Science and Engineering
Dept. 2302, EMCS 313A
615 McCallie Ave.,
Chattanooga, TN 37403 – 2598

PHONE: (423) 425-4395
EMAIL: farah-kandah@utc.edu
URL: http://www.utc.edu/faculty/farah-kandah/

EDUCATION

Ph.D., Computer Science, North Dakota State University (01/2008 – 08/2012)
M.Sc., Computer Science, The University of Jordan (10/2002 – 06/2005)
B.Sc., Computer Science, The Hashemite University (10/1998 – 06/2002)

WORK EXPERIENCE

UC Foundation Assistant Professor (7/2014 – Present) - Computer Science and Engineering Department**,** University of Tennessee at Chattanooga, Chattanooga, TN 37403 (USA).

Assistant Professor (8/2012 – 7/2014) - Computer Science and Engineering Department**,** University of Tennessee at Chattanooga, Chattanooga, TN 37403 (USA).

Teaching Assistant (08/2011 – 06/2012) - Computer Science Department**,** North Dakota State University, Fargo, ND 58103 (USA).

Research Assistant (01/2009 – 08/2011) - Computer Science Department**,** North Dakota State University, Fargo, ND 58103 (USA).

Lecturer and Course Coordinator (08/2005 – 12/2007) - Computer Science Department**,** The Hashemite University, Zarqa, Jordan.

Research Assistant (10/2003 – 06/2005) - Computer Science Department**,** The University of Jordan, Amman, Jordan.

RESEARCH

I focus my research in urban science, public safety, smart networking design, smart vehicle networks, smart communications, cybersecurity and Software-Defined Networks.
My research work strongly relies on providing well-designed schemes, techniques, algorithms, and solutions to solve problems and improve the performance of computer networks as well as providing secure transactions and communications among network's users by eliminating and mitigating malicious attacks.
My research interests and experience span a wide range of topics in wireless ad-hoc network from stationary wireless networks to mobile ad-hoc networks.
For a list of current and future research please visit my research page:
https://www.utc.edu/faculty/farah-kandah/network_communication_lab_/current_research.php

SERVICE

University of Tennessee at Chattanooga, Chattanooga, TN 37403 (USA).

- Petitions Committee (2013 – Present)
- Departmental Honors Committee (2013 – 2014)

Collage of Engineering and Computer Science
University of Tennessee at Chattanooga, Chattanooga, TN 37403 (USA).

- Hiring Committee – Director of Student Success (2016 – Present)
- Hiring Committee – Accounting (2017 – Present)
- Collage Bylaws Committee (2015 – Present)
- Undergraduate/Graduate Commencement
- GENI task force Committee (2015 – Present)
- New/Transfer Student Orientation advisor (2013 – Present)
- Participated in the Faculty Focus Friday – Feb 2017

Computer Science and Engineering Department
University of Tennessee at Chattanooga, Chattanooga, TN 37403 (USA).

- Undergraduate Program Coordinator (2016 – Present)
- Commission on Colleges of the Southern Association of Colleges and Schools (SACSCOC) – Chair (2015 – 2017)
- Accreditation Board for Engineering and Technology (ABET) Committee (2015 – Present)
- Hiring Committee – Faculty Position (2016 – Present)
- Ad-hoc Course Committee (2013 – 2014)
- Programming Language Committee (2012 – 2013)

RECENT PUBLICATIONS

Underlined authors are the students writing papers under my guidance

Farah Kandah and Jesse Whitehead, "Towards Trusted and Energy Efficient Data Collection in Unattended Wireless Sensor Networks", Springer – Wireless Networks – ***In progress 2017***

Farah Kandah and Steven Schmitt, "Using Traffic Pattern Recognition towards Dynamic Virtual Slicing in Software-Defined Networks", IEEE journal on Selected Areas in Communications - ***Submitted 2017***.

Farah Kandah, Steven Schmitt, and Muhammed Akour, "Towards a Smart, Dynamic, and Adaptive Network Design using Virtual Slicing over Software-Defined Network", 15th Annual IEEE Consumer Communications and Networking Conference (CCNC) – ***Accepted 2018***.

Steven Schmitt and Farah Kandah, "Mitigating Denial of Service Attacks using Traffic Pattern Recognition over Software-Defined Network", 15th Annual IEEE Consumer Communications and Networking Conference (CCNC) – ***Accepted 2018***.

Farah Kandah, Steven Schmitt, and Jesse Whitehead, "*Using Hybrid Spectrum Handoff Towards Fairness Usage in Cognitive Radio Networks*", IJIPM: International Journal of Information Processing and Management, Vol. 8, No. 1, pp. 1 ~ 8, **2017**.

Jacob Coleman, Farah Kandah, Steven Schmitt, and Mohammed Akour, "Community Trust Distribution in Vehicle Ad-hoc Networks", Proceedings of the New Trends in Information Technology (NTIT-**2017**).

Farah Kandah and Jesse Whitehead, "Trust-based Survivability Provisioning in Wireless Mesh Networks", IJIPM: International Journal of Information Processing and Management, Vol. 7, No. 2, pp. 36 ~ 47, **2016**

PROFESSIONAL ACTIVITIES

Membership:

- IEEE Member (2010 – Present)
- IEEE Communication Society (ComSoc) member (2010 – Present)
- IEEE Computer Society (2010 – Present)
- ACM Member (2014 – Present)

Chairing:

- International Conference on Computing, Networking and Communications (ICNC 2017) – Session Chair (Communication and Information Security)
- Consumer Communications and Networking Conference (CCNC 2015) – Session Chair (Wireless Networking and Mobility)
- International Conference on Computing, Networking and Communications (ICNC 2015) – Session Chair (Communications Security)
- Network and Information Security Symposium (Co-Chair), International Conference on Communications and Networking in China (ChinaCom 2012)

Guest-Editor:

- IEEE Multimedia Communications Technical Committee (MMTC), "Special Issue: Multimedia Communication in Future Wireless Networks", Nov 2013

TPC Member:

- IEEE International Conference on Communications (ICC) 2015-2018
- IEEE SoutheastCon 2017
- IEEE / ACM International Conference on Connected Vehicles and Expo (ICCVE) 2012-2016
- International Conference on Communications in China (IEEE CIC/ICCC 2016)
- International Conference on Integrated and Sustainable Transportation (INTGAST 2015)
- International Conference on Computing in Mechanical Engineering (ICCME) 2015
- IEEE Wireless Communications and Networking Conference (WCNC) 2013-2015
- IEEE Global Communication Conference (Globecom) 2011-2013
- IEEE International Conference on Computing, Networking and Communications (ICNC) 2012
- IEEE INFOCOM Machine-to-Machine Communications and Networking (M2MCN) 2011

Journal Reviewer:

- IEEE Sensor Journal
- WILEY's Security and Communication Networks (SCN) Journal
- International Journal of Information Processing and Management (IJIPM)
- Journal of Computer Systems, Networks and Communications (JCSNC)
- International Journal of Information Security and Privacy (IJISP)

Conference Reviewer:

- IEEE International Conference on Communications (ICC) 2011
- IEEE Symposium on Computer Communications (ISCC) 2011
- Work in Progress Workshop (WIP) of PerCom 2011
- IEEE Global Communication Conference (Globecom) 2010
- International workshop on Quality of Service (IWQoS) 2010
- IEEE INFOCOM 2010 (Student Workshop)

AWARDS

- **Outstanding Tenured/Tenure-Track Faculty Teaching Computer Science and Engineering Award (2017)**
- **Faculty/Teacher of the Year Award**, Computer Science and Engineering **(2017)**
- **Outstanding Researcher**, Computer Science and Engineering **(2015 – 2016)**
- **UC Foundation Professorship**, **2014**.
- North Dakota State University, **2010** grant to attend and participate in the Consumer Communications and Networking Conference (CCNC 2010) in Las Vegas, NV (USA).
- Tuition waiver and research/teaching assistantship to pursue Ph.D. of Computer Science at North Dakota State University (**2008**).
- Tuition waiver and research assistantship to pursue M.Sc. of Computer Science at the University of Jordan (**2003**).

RECENT TALKS

- Hexagon Safety and Infrastructure (Madison, AL)
    - **Collaboration presentation:** "Software Defined Networks and the Future of Networking (November 2017)
- Oak Ridge National Laboratory (Oak Ridge, TN)
    - **Collaboration presentation:** "Software Defined Networks and the Future of Networking" (October 2017)
- University of Tennessee at Chattanooga – Collage of Engineering and Computer Science
    - Teaching Workshop: "Teaching Online Courses and Keeping Students on Track" (March 2017)
- IEEE ICNC 2017 (Silicon Valley, CA)
    - **Workshop on Computing, Networking and Communications (CNC):** " Cluster-Based Dynamic Backup in Cognitive Radio Networks ", Silicon Valley, CA (January 26-29, 2017)
- IEEE ICNC 2017 (Silicon Valley, CA)
    - **Workshop on Computing, Networking and Communications (CNC):** "Efficient Key Management for Big Data Gathering in Dynamic Sensor Networks", Silicon Valley, CA (January 26-29, 2017)
- The 2016 Fall ACM Mid-Southeast Conference (Gatlinburg, TN)
    - **Keynote Speaker**: "Software Defined Networks and the Future of Networking", Gatlinburg, TN (November 10-11, 2016)

CERTIFICATION/TRAINING

- Quality Matters, Applying Quality Matters Rubric (2017).
- IT Security Awareness Training (UTC) - 2017

SKILLS AND QUALIFICATIONS

- Operating Systems: Linux/Unix, Windows 7/Vista/XP, MAC OS.
- Simulation Tools: LEDA, GloMoSim, NS2, Matlab.
- Learning management systems: Blackboard, Skills Assessment Manager (SAM)
- Programming Languages: C/C++, JAVA, Python.
- Document markup languages: LaTeX.
- Integrated development environments (IDEs): Visual Studio, Eclipse, Netbeans, Textpad.

- Web development: Dreamweaver, Photoshop, HTML, CSS.
- Hardware: PC Upgrades/repairs, Wireless Sensors.
- Familiar with: Android, JavaScript, Microsoft Expressions Web, Visual Basic.
- Skills:
    - 5+ years of algorithm design and 9+ years of programming experience.
    - Strong analytical and organizational skills.
    - Fast learning ability with strong ability to reach goals.
    - Leadership, team building, and project management.
    - Self-motivated.
    - Excellent oral and written communication skills.

PROJECTS

- WECAAN: Wide Emergency Crowdsourced Automated Adaptive Networking System
- Quality of Service Assurance using the Global Environment for Networks Innovation (GENI)
- Throughput Evaluation in Global Environment for Networks Innovation (GENI)
- Path Signature Mitigation Scheme against malicious attacks (Simulated using GloMoSIM)
- Misleading Routing Attack in Mobile Ad-hoc Networks. (Simulated using GloMoSim)
- Collusion Injected Attack in Mobile Ad-hoc Networks. (Simulated using GloMoSim and LEDA)
- Performance evaluation of TCP's Fast Retransmission mechanism (Simulated using NS2)
- Endogenous Retrovirus (ERV) in Human Genome (Implemented using JAVA).

FOUNDING DIRECTOR

- Network Communication Laboratory (2012 – Present)

GRADUATE ADVISOR

- **Steven Schmitt,** M.Sc. Student, University of Tennessee at Chattanooga (2016 - Present).
- **Jacob Coleman,** M.Sc. Student, University of Tennessee at Chattanooga (2016 - Present).
- **John O'Keefe-Odom,** M.Sc. Student, University of Tennessee at Chattanooga (2016 - Present).
- **Justin Jushuva**, M.Sc. Student, University of Tennessee at Chattanooga (2016 - 2017).
- **Jesse Whitehead**, M.Sc. Student, University of Tennessee at Chattanooga (2014 - 2016).
- **Raj Thakkar**, M.Sc. Student, University of Tennessee at Chattanooga (2013 - 2014).
- **Adrian Powel**, M.Sc. Student, University of Tennessee at Chattanooga (2013 - 2014).
- **Nastassia Munson**, M.Sc. Student, University of Tennessee at Chattanooga (2012 - 2013).
- **Yashaswi Singh**, M.Sc. Student, North Dakota State University (2010 – 2011).

RESEARCH ADVISOR

Network Communication Laboratory Group Members

- **Maxwell Omwenga,** PhD Student, University of Tennessee at Chattanooga (2017 - Present).
- **Steven Schmitt,** M.Sc. Student, University of Tennessee at Chattanooga (2016 - Present).
- **Dylan Brownell,** B.Sc. Student, University of Tennessee at Chattanooga (2017 - Present).
- **Jesse Whitehead**, M.Sc. Student, University of Tennessee at Chattanooga (2014 - 2016).
- **Dustin Howerton**, B.Sc Student, University of Tennessee at Chattanooga (2014 – 2016).
- **Jacquelyn Prebula,** B.Sc Student, University of Tennessee at Chattanooga (2014 – 2015).

Dalei Wu
Assistant Professor
Department of Computer Science and Engineering
University of Tennessee at Chattanooga
615 McCallie Ave., Chattanooga, TN 37403-2598
Tel: 423-425-4386, E-mail: dalei-wu@utc.edu
https://www.utc.edu/faculty/dalei-wu/

EDUCATION

• Univ. of Nebraska-Lincoln	Computer Engineering	Ph.D.,	2006-2010
• Shandong University	Electrical Engineering	M.E.,	2001-2004
• Shandong University	Electrical Engineering	B.S.,	1997-2001

APPOINTMENTS

- Assistant Professor (08/2014 - present), Dept. of Computer Science and Engineering, University of Tennessee at Chattanooga, USA
- Postdoctoral Research Associate (10/2011 - 06/2014), Mechatronics Research Lab, Dept. of Mechanical Engineering, Massachusetts Institute of Technology, USA
- Postdoctoral Research Fellow (01/2011 - 09/2011), Dept. of Computer and Electronics Engineering, University of Nebraska-Lincoln, USA
- System Engineer (01/2005 - 08/2005), OFDMA Technical Staff, ZTE Telecom, China

RESEARCH INTEREST

- Intelligent Networked Systems, Cyber-Physical Systems
- Complex Dynamic System Modeling, Optimization, and Control

RRESEARCH PROJECTS

- NSF "US Ignite: Collaborative Research: Focus Area 1: Fiber Network for Mapping, Monitoring and Managing Underground Urban Infrastructure," $299,884, 01/2017 - 12/2019, PI
- NSF “SFS Program: Strengthening the National Cyber Security Workforce,” $1,540,763, 01/2017 - 07/2021, Senior Personnel.
- UTC Undergraduate Research and Creative Endeavor (URaCE) Summer Fellowship in Smart Cities and Urban Systems, $15,000, 05/2018 - 08/2018, PI
- Tennessee Higher Education Commission’s Center of Excellence in Applied Computational Science and Engineering (CEACSE): “Multiscale Serviceability Analysis and Assessment of Urban Infrastructure,” $95,610, 07/2016 - 06/2017, PI.
- UTC Collaborative Research Initiative for Sponsored Programs (CRISP): “Virtual TaiJi System: an Innovative Rehabilitation Strategy,” $8,000, 07/2015 - 06/2016, Co-PI.
- NSF, “Making Opportunities for Computer Science and Computer Engineering Students,” $585,020, 07/2013 - 06/2018, Co-PI (replaced Dr. Thompson).

AWARDS AND HONORS

- *Smart 50 Awards*, Project “Underground Infrastructure Sensing” was awarded as one of 50 most transformative smart projects by Smart Cities Connect Conference & Expo 2018, Kansas City, MO.
- *Semi-Finalist Team Member*, MIT $100K Entrepreneurship Competition, 2013
- *Chinese Government Award for Outstanding Students Abroad*, 2010 (Ph.D. students only)
- *Outstanding Graduate Research Fellowship*, University of Nebraska-Lincoln, USA, 2009
- *Student Travel Grant Award*, The Sixth IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON 2009), Rome, Italy, June 2009

- *Shandong Province Outstanding Graduate Award*, China, May, 2004
- *Shandong University Outstanding Graduate Award*, Shandong University, China, May 2004
- *KEHUI Graduate Research Fellowship*, Shandong University, China, October 2003

PUBLICATIONS

Journal Papers

1. J. Tian, H. Zhang, **D. Wu**, and D. Yuan, "QoS-Constrained Medium Access Probability Optimization in Wireless Interference-Limited Networks," *IEEE Transactions on Communications*, accepted, Nov. 2017.
2. D. Wu, Q. Liu, H. Wang, **D. Wu**, and R. Wang, "Socially-Aware Energy Efficient Mobile Edge Collaboration for Video Distribution," *IEEE Transactions on Multimedia*, vol. 19, no. 10, Oct. 2017.
3. Y. Cao, H. Zhang, **D. Wu**, and D. Yuan, "OGCMAC: A Novel OFDM based Group Contention MAC for VANET Control Channel," *IEEE Transactions on Wireless Communications*, vol. 16, no. 9, Sept. 2017.
4. S. Guo, H. Zhang, P. Zhang, **D. Wu**, and D. Yuan, "Generalized 3-D Constellation Design for Spatial Modulation," *IEEE Transactions on Communications*, vol. 65, no. 8, Aug. 2017.
5. D. Wu, J. Yan, H. Wang, **D. Wu**, and R. Wang, "Social Attribute Aware Incentive Mechanism for Device-to-Device Video Distribution," *IEEE Transactions on Multimedia*," vol. 19, no. 8, Aug. 2017.
6. T. Jiang, H. Wang, M. Daneshmand, and **D. Wu**, "Cognitive Radio based Smart Grid Traffic Scheduling with Binary Exponential Backoff," *IEEE Internet of Things Journal*, vol. 4, no. 6, Dec. 2017.
7. Y. Ye, **D. Wu**, Z. Shu, and Y. Qian, "Overview of LTE Spectrum Sharing Technologies," *IEEE Access*, Oct. 2016.
8. D. Wu, B. Yang, H. Wang, **D. Wu**, and R. Wang, "An Energy-Efficient Data Forwarding Strategy for Heterogeneous WBANs," *IEEE Access*, Volume 4, Sept. 2016.
9. Y. Liang, **D. Wu**, G. Liu, Y. Li, C. Gao, Z. Ma, and W. Wu, "Big Data-enabled Multiscale Serviceability Analysis for Aging Bridges," *Digital Communications and Networks*, July 2016.
10. N. Lin, S. Ci, and **D. Wu**, "Reconfigurable Battery Techniques and Systems: A Survey," *IEEE Access*, volume 4, April, 2016.
11. S. Ren, T. Lin, W. An, G. Zhang, **D. Wu**, L. Bhuyan, and Z. Xua, ``Design and Analysis of Cooperative EPC and RAN Caching for LTE Mobile Networks," *Computer Networks*, Vol. 93, Part 1, Dec. 2015, Pages 80-95.
12. J. Tian, H. Zhang, **D. Wu**, D. Yuan, "Cross-Layer Assisted Power and Rate Control for Video Transmission in Wireless Networks," *Journal of Communication*, vol. 11, no. 2, Feb. 2016.
13. **D. Wu**, D. Chatzigeorgiou, K. Youcef-Toumi, and R. Mansour, "Node Localization in Robotic Sensor Networks for Pipeline Inspection," *IEEE Transactions on Industrial Informatics*, vol. 12, no. 2, Aug. 2015.
14. J. Tian, H. Zhang, **D. Wu**, D. Yuan, "Interference-aware Cross-layer Design for Distributed Video Transmission in Wireless Networks," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 26, no. 5, May 2015.
15. H. Luo, W. An, S. Ci, and **D. Wu**, "A Distributed Utility-based Scheduling for Peer-to-Peer Video Streaming over Wireless Networks," *Wireless Communications and Mobile Computing*, July 2015.
16. **D. Wu**, D. Chatzigeorgiou, K. Youcef-Toumi, S. Mekid, and R. Mansour, "Channel-aware Relay Node Placement in Wireless Sensor Networks for Pipeline Inspection," *IEEE Transactions on Wireless Communications*, vol. 13, no. 7, July 2014.
17. Z. Zhang, I. Silva, **D. Wu**, J. Zheng, H. Wu, W. Wang, "Adaptive Motion Artifact Reduction in Respiration and ECG Signals for Wearable Healthcare Monitoring Systems," *Medical & Biological Engineering & Computing*, in print, Oct., 2014.

18. A. Rashwan, H. Wang, **D. Wu**, "Security-Quality Aware Routing for Wireless Multimedia Sensor Networks Using Secret Sharing", *Security and Communication Networks*, in print, Oct., 2014.
19. W. An, S. Ci, H. Luo, **D. Wu**, V. Adamchuk, H. Sharif, X. Wang and H. Tang, "Effective Sensor Deployment Based on Field Information Coverage in Precision Agriculture," *Wiley Journal of Wireless Communications and Mobile Computing*, Oct. 2013
20. W. An, J. Lin, F. Shao, H. Luo, S. Ci, and **D. Wu**, "Importance-based data transmission optimization in multi-source single-sink wireless sensor networks", *Wiley Journal of Wireless Communications and Mobile Computing*, July. 2012.
21. S. Ci, **D. Wu**, Y. Ye, Z. Han, G. Su, H. Wang, and H. Tang, "Video Summary Delivery over Cooperative Wireless Networks," *IEEE Wireless Communications, Special Issue on User Cooperation in Wireless Networks*, April 2012.
22. Y. Ye, S. Ci, **D. Wu**, H. Wang, A. K. Katsaggelos, "Cross-layer Design and Optimization for Video Surveillance Systems," *E-Letter of the Multimedia Communications Technical Committee (MMTC), IEEE Communications Society*, vol. 7, no. 4, April 2012.
23. S. Ci, J. Qian, **D. Wu**, and A. Keyhani, "Impact of Wireless Communication Delay on Load Sharing among Distributed Generation Systems through Smart Microgrids," *IEEE Wireless Communications, Special Issue on Recent Advances in Wireless Technologies for Smart Grid*, in press, April 2012.
24. Z. Song, H. Wang, Y. Wen, **D. Wu**, Ken Lee, "Depth-color based 3D Image Transmission over Wireless Networks with QoE Provisions," *Computer Communications*, 2012.
25. **D. Wu**, S. Ci, H. Luo, and H. Wang "Video Surveillance over Wireless Sensor and Actuator Networks Using Active Cameras," *IEEE Transactions on Automatic Control, Special Issue on Wireless Sensor and Actuator Networks***,** vol. 56, no. 10, Oct. 2011.
26. **D. Wu**, S. Ci, H. Luo, and H. Guo, "A Theoretical Framework for Interaction Measure and Sensitivity Analysis in Cross-Layer Design," *ACM Transactions on Modeling and Computer Simulation*, vol. 21, issue 1, Dec. 2010.
27. **D. Wu**, S. Ci, H. Wang, and A. Katsaggelos, "Application-Centric Routing for Video Streaming over Multi-hop Wireless Networks," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 20, no. 12, Dec. 2010.
28. **D. Wu**, S. Ci, and H. Wang, "Cross-Layer Optimization for Video Summary Transmission over Wireless Networks," *IEEE Journal on Selected Areas in Communications (JSAC)*, vol.25, no. 4, May 2007, pp. 841-850.
29. **D. Wu**, S. Ci, H. Luo, H. Wang, and A. Katsaggelos, "A Quality-Driven Decision Engine for Service-Oriented Live Video Transmission," *IEEE Wireless Communications, Special Issue on Service-Oriented Broadband Wireless Network Architecture*, vol. 16, issue 4, 48-54, Aug. 2009.
30. H. Luo, S. Ci, **D. Wu**, and A. Argyriou, "Joint Source Coding and Network-Supported Distributed Error Control for Video Streaming in Wireless Multi-Hop Networks," *IEEE Transactions on Multimedia*, vol. 11, no. 7, Nov. 2009, pp. 1362-1373.
31. H. Luo, S. Ci, and **D. Wu**, "A Cross-layer Design for the Performance Improvement of Real-time Video Transmission of Secondary Users over Cognitive Radio Networks," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 21, no. 8, Aug. 2011, pp. 1040-1048.
32. H. Luo, S. Ci, and **D. Wu**, "Cross-layer Optimized End-to-End TCP Friendly Rate Control for Real-Time Video Streaming," *Journal of Visual Communication and Image Representation*, vol. 21, issue 2, Feb. 2010, pp. 98-106.
33. H. Luo, S. Ci, **D. Wu**, K. Siu, and N. Stergiou, "Content-aware Wireless Real-time Streaming for Marker-less Human Motion Tracking," *IEEE Wireless Communications Magazine, Special Issue on Wireless Technologies for E-healthcare*, vol. 17, issue 1, Feb. 2010, pp. 37-43.
34. S. Ci, H. Wang, and **D. Wu**, "A Theoretical Framework for Quality-Aware Cross-Layer Optimized Wireless Multimedia Communications," *Advances in Multimedia*, 2008, pp. 1-10.
35. J. Zhang, **D. Wu**, S. Ci, H. Wang, and A. K. Katsaggelos, "Power-Aware Mobile Multimedia: a Survey," *Journal of Communications*, vol. 4, no. 9, Oct. 2009, pp. 600-613.

36. H. Luo, S. Ci, **D. Wu,** J. Wu, and H. Tang, "Quality-driven cross-layer optimized video delivery over LTE," *IEEE Communications Magazine, Special Issue on WiMAX/LTE systems,* vol. 48, no. 4, Feb. 2010, pp. 102-109.
37. H. Luo, S. Ci, **D. Wu**, W. An, "Cross-layer Based P2P Scheduling in Wireless Multimedia Networks," *E-Letter of the Multimedia Communications Technical Committee (MMTC), IEEE Communications Society*, vol. 6, no. 9, pp.55-58, Sept. 2011.

Book Chapters:

1. Y. Liang, D. Wu, and et al., "Civil Infrastructure Serviceability Evaluation Based on Big Data," Guide to Big Data Applications, Springer, Editor: S. Srinivasan. Dec. 2016.
2. W. An**, D. Wu**, S. Ci, H. Luo, V. Adamchuk, and Z. Xu, "Agriculture Cyber-Physical Systems," Cyber-Physical Systems: Foundations, Principles, and Applications, H. Song, D. Rawat, S. Jeschke, and C. Brecher, Eds. Elsevier Inc., Sept. 2015.
3. J. Sun, **D. Wu**, J. Zhang, X. Wang, and S. Ci, "Energy-Aware Mobile Multimedia Computing," *Handbook of Energy-Aware and Green Computing*, Chapman&Hall/CRC Press.
4. H. Luo, S. Ci, and **D. Wu**, "Real-time Multimedia Transmission over Cognitive Radio Networks," *Cognitive Radio Mobile Ad Hoc Networks*, ISBN: 978-1-4419-6171-6, Springer.

Conference Papers:

1. S. Xu, H. Zhang, J. Tian, **D. Wu**, and D. Yuan, "Pilot Length Optimization for Spectral and Energy Efficient D2D Communications Underlay Massive MIMO Networks," *2018 International Conference on Computing, Networking and Communications (ICNC)*.
2. S. Guo, **D. Wu**, H. Zhang, and D. Yuan, "Queueing Network Model and Average Delay Analysis for Mobile Edge Computing," *2018 Workshop on Computing, Networking and Communications*.
3. T. Jiang, H. Wang, and **D. Wu**, "A Novel Media Access Scheme in Cognitive Radio Ad Hoc Networks with Handshaking Mechanisms," *IEEE GLOBECOM*, Dec. 2016.
4. A. Dong, H. Zhang, **D. Wu**, and D. Yuan, "QoS-Constrained Transceiver Design and Power Splitting for Downlink Multiuser MIMO SWIPT Systems," *IEEE ICC*, May 2016.
5. N. Lin, S. Ci, and **D. Wu**, "A Novel Low-Cost Online State of Charge Estimation Method for Reconfigurable Battery Pack," *APEC 2016*, Mar. 2016.
6. X. Han, H. Zhang, **D. Wu**, and D. Yuan, "Fairness-based Pilot Allocation in Multi-Cell Massive MIMO Systems," *The International Conference on Wireless Communications & Signal Processing (WCSP)*, Oct. 2015.
7. L. Zhang, H. Zhang, **D. Wu**, and D. Yuan, "Improving Physical Layer Security for MISO Systems via Using Artificial Noise," *IEEE GLOBECOM*, Dec. 2015
8. Y. Liang, **D. Wu**, A. Clark, Z. Guo, and N. Fell "Virtual TaiJi System - An Innovative Modality for Rehabilitation," *BSEC 2015: Collaborative Biomedical Innovations, Data Sciences for Actionable Health Insights*. Aug. 25-27, 2015 Oak Ridge, TN
9. A. Dong, H. Zhang, **D. Wu**, and D. Yuan, "Logarithmic Expectation of the Sum of Exponential random Variables for Wireless Communication Performance Evaluation," Sept. *VTC2015-Fall*.
10. J. Qiao, H. Zhang, **D. Wu**, and D. Yuan "Secrecy Rate Analysis for Jamming Assisted Relay Communications Systems", in Proc. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Brisbane, Australia, April 2015.
11. W. An, C. Ren, S. Ci, **D. Wu**, H. Luo, and Y. Liu, "A Novel Low-Complexity Method for Determining Nonadditive Interaction Measures Based on Least-Norm Learning," in Proc. *IEEE International Conference on Fuzzy Systems*, Beijing, China, 2014.
12. **D. Wu,** K. Youcef-Toumi, S. Mekid, and R. Ben Mansour, "Relay Node Placement in Wireless Sensor Networks for Pipeline Inspection," in *Proc. the 2013 American Control Conference*, Washington DC, June, 2013.

13. W. An, S. Ci, H. Luo, **D. Wu**, Y. Han, Y. Qi, T. Lin, "Overall Cost Minimization for Data Aggregation in Energy-Constrained Wireless Sensor Networks," in Proc. *IEEE International Conference on Communications*, Budapest, Hungary, June 2013.
14. W. An, S. Ci, **D. Wu**, Y. Han, Y. Qi, and T. Lin, "Transmission Cost Minimization with Vulnerability Constraint inWireless Sensor Networks," in Proc. *IEEE Wireless Communications and Networking Conference*, Shanghai, China, April 2013.
15. **D. Wu**, S. Ci, H. Luo, W. Zhang, and J. Zhang, "Cross-Layer Rate Adaptation for Video Communications over LTE Networks," in Proc. *IEEE Global Communications Conference (IEEE GLOBECOM)*, Anaheim, CA, Dec. 2012.
16. Y. Ye, S. Ci, Y. Liu, **D. Wu**, H. Wang, and A. Katsaggelos, "A Wireless Video Surveillance System with An Active Camera," in Proc. *The Visual Communications and Image Processing (VCIP) Conference*, San Siego, CA, Nov. 2012.
17. J. Sun, **D. Wu**, and S. Ci, "Battery Capacity Footprinting and Optimization Analysis for Wireless Multimedia Communication," in *Proc. IEEE GLOBECOM*, 2011.
18. W. An, **D. Wu**, and S. Ci, "A Theoretical Framework for Modeling Dynamical Complex System with Partial Observations," in *Proc. The Eighth International Conference on Complex Systems (ICCS)*, Boston, MA, Jun., 2011.
19. J. Sun, **D. Wu**, and S. Ci, "Battery-Aware Wireless Video Delivery," in *Proc. The 7th International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QShine)*, invited paper, 2010.
20. H. Luo, S. Ci, **D. Wu**, and H. Tang, "Adaptive Wireless Multimedia Communications with Context-awareness Using Ontology-based Models," in *Proc. IEEE Global Communications Conference (IEEE GLOBECOM'10)*, Dec. 2010,
21. H. Luo, S. Ci, **D. Wu**, and H. Tang, "Cross-layer Design for Real-time Video Transmission in Cognitive Wireless Networks," in *Proc. IEEE INFOCOM-2010 Workshop on Cognitive Wireless Communications and Networking*, Mar. 2010,
22. **D. Wu**, S. Ci, H. Luo, H. Wang, and A. Katsaggelos, "Application-Centric Routing for Video Streaming over Multi-hop Wireless Networks," in *Proc. The Sixth Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON'09)*, Rome, Italy, Jun., 2009.
23. H. Luo, S. Ci, and **D. Wu**, "A Cross-Layer Optimized Distributed Scheduling Algorithm for Peer-to-Peer Video Streaming over Wireless Multi-hop Mesh Networks," in *Proc. The Sixth Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (*SECON'09*)*, Rome, Italy, Jun., 2009.
24. **D. Wu**, Z. Han, S. Ci, G. Su, H. Wang, and H. Tang, "Cooperative Video Summary Transmission in Wireless Networks," in *Proc. IEEE Sarnoff Symposium*, Princeton, NJ, USA, Mar. 2009.
25. H. Luo, **D. Wu**, and S. Ci, "TFRC-Based Rate Control for Real-Time Video Streaming over Wireless Multi-hop Mesh Networks," in *Proc. IEEE International Conference on Communications (ICC'09)*, Dresden, Germany, Jan. 2009.
26. **D. Wu**, H. Luo, S. Ci, H. Wang, and A. Katsaggelos, "Quality-Driven Optimization for Content-Aware Real-Time Video Streaming in Wireless Mesh Networks," in *Proc. IEEE Global Communications Conference (IEEE GLOBECOM'08)*, New Orleans, LA, USA, Dec. 2008.
27. H. Luo, **D. Wu**, S. Ci, A. Argyriou, and H. Wang, "Quality-Driven TCP Friendly Rate Control for Real-Time Video Streaming," in *Proc. IEEE Global Communications Conference (IEEE GLOBECOM'08)*, New Orleans, LA, USA, Dec. 2008.
28. **D. Wu**, S. Ci, and H. Wang, "Cross-Layer Optimization for Packetized Video Communication over Wireless Mesh Networks," in *Proc. IEEE International Conference on Communications (IEEE ICC'08)*, Beijing, China, May 2008.
29. S. Ci, H. Wang, and **D. Wu**, "From Heuristic to Theoretical: a New Design Methodology for

Cross-Layer Optimized Wireless Multimedia Streaming," in *Proc. The 16th International Packet Video Workshop (IEEE PV'07)*, Lausanne, Switzerland, Nov. 2007.

30. **D. Wu**, S. Ci, Y. Yang, and H. Sharif, "Packet Size Optimization for Goodput Enhancement of Multi-Rate Wireless Networks," in *Proc. IEEE Wireless Communications and Networking Conference (IEEE WCNC'07)*, Hong Kong, Mar. 2007.
31. **D. Wu**, S. Ci, and H. Wang, "Cross-Layer Design for Multimedia Delivery over Wireless Networks," in *Proc. IEEE International Symposium on Multimedia (IEEE ISM'06)*, San Diego, CA, USA, Dec. 2006, (**Invited Paper**).
32. **D. Wu** and S. Ci, "Cross-Layer Design for Combining Adaptive Modulation and Coding with Hybrid ARQ to Enhance Spectral Efficiency," in *Proc. IEEE International Conference on Broadband Communications, Networks, and Systems (BroadNets'06)*, San Jose, CA, USA, October 2006.
33. **D. Wu** and S. Ci, "Cross-Layer Combination of Hybrid ARQ and Adaptive Modulation and Coding for QoS Provisioning in Wireless Data Networks," in *Proc. IEEE/ACM International Conference on Quality of Service in Heterogeneous Wired/Wireless Networks (IEEE/ACM QShine'06)*, Waterloo, Canada, Aug. 2006.
34. **D. Wu** and S. Ci, "Cross-layer design for combining adaptive modulation and coding with hybrid ARQ," in *Proc. IEEE International Wireless Communications and Mobile Computing Conference (IEEE IWCMC'06)*, Vancouver, Canada, Jul. 2006.
35. **D. Wu**, H. Zhang, D. Yuan, M. Jiang, and P. Zhang, "Performance of OFDM System Using Nonstandard MLC/MQAM Schemes," in *Proc. IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC'03)*, Beijing, China, Sept. 2003.
36. **D. Wu**, H. Zhang, D. Yuan, and M. Jiang, "Performance of MLC-STBC for OFDM Systems over Frequency Selective Fading Channels," in *Proc. The 5th ITG Conference on Source and Channel Coding (SCC'04)*, Erlangen, German, Jan., 2004.
37. **D. Wu**, D. Yuan, M. Jiang, and H. Zhang, "The Parameter Design of Coded OFDM Systems in Mobile Fading Channels", in *Proc. International Conference on Software, Telecommunications and Computer Networks (SOFTCOM'03)*, Split, Dubrovnik Croatia, Ancona, Venice Italy, Oct. 2003.
38. **D. Wu**, C. Li, D. Yuan, and H. Zhang, "The Parameter Design of Coded OFDM Systems in COST 207 Frequency Selective Fading Channels," in *Proc. The International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS)*, Awaji Island, Japan, Dec. 2003.
39. Y. Jia, D. Yuan, and **D. Wu**, "Performance Comparison of STBC and SFBC in Turbo Coded OFDM Systems," in *Proc. International Conference on Wireless Communications Networking and Mobile Computing Proceedings (WCNMC'05)*,Wuhan, China, Sept. 2005.
40. H. Zhang, D. Yuan, **D. Wu**, and M. Jiang, "Performance Research between Turbo and LDPC Coded WOFDM on Rayleigh Fading Channels," in *Proc. International Conference on Information Technology for Application (ICITA'04)*, Harbin, China, 2004.
41. H. Zhang, D. Yuan, M. Jiang, and **D. Wu**, "Research of DFT-OFDM and DWT-OFDM on Different Transmission Scenarios," in *Proc. International Conference on Information Technology for Application (ICITA'04)*, Harbin, China, 2004.
42. H. Zhang, D. Yuan, M. Jiang, and **D. Wu**, "Comparison of Coded OFDM with Different Orthogonal Base," in *Proc. IEEE the 11th Conference on Software, Telecommunications and Computer Networks (SoftCOM03)*, Venice, Italy, Oct. 2003.
43. H. Zhang, D. Yuan, M. Jiang, and **D. Wu**, "Performance Comparison of Coded WOFDM with Different Channel Codes," in *Proc. IEEE Radio and Wireless Conference (RAWCON'03)*, Boston, USA, Aug. 2003.
44. H. Zhang, D. Yuan, M. Jiang, C. Wang, and **D. Wu**, "Performance Analysis of Coded OFDM and Uncoded OFDM System on AWGN and Frequency Selective Fading Channel," in *Proc. the 7th International Symposium on Communications Theory and Applications (ISCTA'03)*, Ambleside,

UK, Jul. 2003.

Patents

1. **D. Wu**, K. Youcef-Toumi, S. Mekid, R. B. Mansour, “Wireless Communication Systems for Underground Pipe Inspection," MIT Technology Licensing Office, Application No. 61/918791, filed, Dec. 2013.

TEACHING COURSES

- CPSC 4240/5240 Principle of Data Analytics, Spring 2018, Spring 2017, Spring 2015
- CPSC 4530/5530 Data Visualization and Exploration, Fall 2015
- CPEN 4700/5700 Computer Architecture, Spring 2016
- CPSC 5100 Theory of Computer Programming Languages, Fall 2017, Fall 2016, Fall 2015
- CPSC 5000 Fundamentals of Computer Science, Fall 2017, Fall 2016
- CPEN 3700 Digital Logic and Introduction to Computer Hardware, Fall 2017, Fall 2016, Fall
- 2014
- CPSC 3200 Algorithm Analysis and Advanced Data Structures, Spring 2017
- CPSC 1100 Fundamentals of Computer Science, Spring 2018, Summer 2017, Spring 2017,
- Spring 2016, Fall 2015, Spring 2015

PROFESSIONAL SERVICES

Editorship

- Editor-in-Chief, International Journal of Information Security and Privacy, since 04/2016
- Associate Editor, Wiley Security and Communication Networks Journal, since 10/2011
- Editor, Journal of Communications and Information Sciences
- Editorial Board Member, Journal of Network and Communication Technologies
- Editorial Board Member, Journal of Cyber-Physical Systems
- Guest Editor, IEEE Internet of Things Journal, Special Issue on Internet of Things for Smart and Connected Health, 2015
- Guest Editor, Wiley’s Security & Communications Networks Journal, Special Issue on Security and Networking for Cyber-Physical Systems, 2013
- Guest Editor, International Journal of Ad Hoc and Ubiquitous Computing, Special Issue on Localization and Positioning for Healthcare Applications, 2014-2015

Conferences: Member of Organizing Committee

- Symposium Co-Chair, IEEE/CIC ICCC 2017, - The sixth IEEE/CIC International Conference on Communications in China, August 2017.
- Workshop Chair, The 8th International Conference on Mobile Multimedia Communications, May 2015.
- Track Co-Chair, BODYNETS 2013, - Special Track on Healthcare Applications and Challenges of Body Area Networks, the 8th International Conference on Body Area Networks
- Symposium Co-Chair, ICNC 2013, - Green Computing Symposium, The 2013 International Conference on Computing, Networking and Communications

Conferences: Member of Technical Program Committee

- IEEE INFOCOM, 2016, 2017, 2018
- IEEE International Conference on Communications (ICC) 2018
- ICNC’16 WAHS, 2016

- IEEE Global Communications Conference (GLOBECOM), 2010, 2011, 2012, 2016, 2017
- IEEE WCNC 2017
- The 23rd International Conference on Telecommunications (ICT 2016)
- The IEEE/CIC International Conference on Communications in China, 2015
- The 2nd International Symposium on Future Information and Communication Technologies for Ubiquitous HealthCare, 2015
- International Conference on Computing, Networking and Communications, Wireless Ad Hoc and Sensor Networks Symposium, 2015
- IEEE ICC - Workshop on Smart Communication Protocols and Algorithms, 2015
- IEEE International Conference on Internet of Things, 2013, 2014
- ACM Research in Adaptive and Convergent Systems (RACS), 2014
- The 9th International Conference on Body Area Networks, 2014
- International Conference on Connected Vehicles & Expo, 2012
- IEEE International Conference on Multimedia & Expo (ICME), 2012, 2013
- The 3rd International Conference on Computer Science and its Applications (CSA), 2011
- International Conference on CMC, 2011, 2012
- IEEE International Conference on Computer and Information Technology (CIT), 2012
- The Third IEEE International Conference on Smart Grid Communications, Workshop on Cognitive and Machine-to-Machine Communications and Networking for Smart Grids, 2012
- IEEE International Conferences on Communications (ICC), the 2nd IEEE International Workshop on Smart Communication Protocols and Algorithms (SCPA), 2012
- IEEE International Conference on Computer Communications Networks (ICCCN), the Workshop on Energy and Thermal Management of Embedded Computing (ETMEC), 2011
- The 6th International ICST Conference on Wireless Internet (WICON), 2011
- IEEE International Conference on Computational Science and Engineering (CSE), Advanced Networking and Applications Symposium, 2010
- The 13th IEEE International Conference on Communication Technology (ICCT), 2011
- IEEE Symposium on Industrial Electronics & Applications, 2012
- The First IEEE International Conference on Communications in China 2012, Wireless Networking and Applications Symposium

Memberships

- Member of IEEE and IEEE Communication Society
- Co-Director of the Communications - Frontiers Board, Multimedia Communications Technical
- Committee, IEEE Communication Society

Referee for Journals

- IEEE Transactions on Systems, Man and Cybernetics
- IEEE Access
- IEEE Internet of Things Journal
- IEEE Transactions on Industrial Informatics
- IEEE/ACM Transactions on Networking
- IEEE Transactions on Automatic Control
- IEEE Journal on Selected Areas in Communications
- IEEE Transactions on Mobile Computing
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Multimedia
- ACM Transactions on Modeling and Computer Simulation

- IEEE Transactions on Wireless Communications
- IEEE Transactions on Vehicular Technology
- IEEE Wireless Communications Magazine
- IEEE Communications Magazine
- IEEE Communications Letters
- EURASIP Journal on Wireless Communications and Networking
- Advances in Multimedia
- Journal of Supercomputing
- Journal of Computer Systems, Networks, and Communications
- Wireless Communications and Mobile Computing
- Journal of Communications
- Journal of Network and Computer Applications
- Journal of Medical Systems
- International Journal of Communication Systems
- Transactions on Information Technology in BioMedicine
- KSII Transactions on Internet and Information Systems
- Mobile Networks and Applications
- Security and Communication Networks
- International Journal of Performability Engineering
- Communications
- Journal of Communications and Information Sciences
- Journal of Network and Communication Technologies
- Telecommunication Systems
- International Journal of Healthcare Information Systems and Informatics
- International Journal of Distributed Sensor Networks

David R. Schwab

6 Rose Circle
Chattanooga, TN 37419
423-580-8148
david-schwab@utc.edu

Education

B.E. Electrical Engineering and Computer Science, 2001, Vanderbilt University, Nashville, TN
M.M. Jazz Studies, 2004, University of New Orleans, New Orleans, LA
M.S. Computer Science, 2012, University of Tennessee at Chattanooga, Chattanooga, TN

Honors and Awards

Phi Eta Sigma Freshman Honorary
Alpha Lambda Delta Freshman Honorary
Best Graphics, Engineering Project Fair, Vanderbilt University
Eta Kappa Nu Honorary
Tau Beta Pi Honorary
Outstanding Lecturer – Computer Science Department – University of Tennessee at Chattanooga

Research Interests

Computer Security

- IoT Security
- Mobile Security
- Cloud Security

Real–Time Embedded Systems

Professional Experience

August 2014–Present
University of Tennessee at Chattanooga – Lecturer – Taught lecture and lab courses for the department of computer science. Advise students on course selection and career choices.

August 2013–May 2014
University of Tennessee at Chattanooga – Adjunct Faculty – Taught lecture and lab courses for the department of computer science.

Feb 2007–May 2014
Chattanooga State Community College – Adjunct Faculty – Taught private lessons for jazz bass and jazz guitar. Directed jazz band rehearsals culminating in a semester end concert. Accompanied jazz band to local community performances.

Aug 2009–May 2014
Lee University – Adjunct Faculty – Taught private lessons for electric bass as part of the commercial music degree.

May 2012–Aug 2012
University of Tennessee at Chattanooga – Graduate Researcher – Performed research in the field of mobile security under the direction of Dr. Li Yang. Created a mobile application that used picture authentication, fuzzy passwords, and encryption/decryption techniques to create a secure communications channel between the mobile device and a server executing in a cloud environment.

Aug 2009–Apr 2012
Tennessee Temple University – Adjunct Faculty – Taught private lessons on guitar and bass for the music department.

Sept 2005–Dec 2006
University of Tennessee at Chattanooga – Tech Support / Researcher – Provided tech support for the engineering/computer science labs at UTC. Performed research involving 3D visualizations of medical images on different display mediums.

Sept 2004–March 2005
Carnival Cruise Lines – Jazz Trio – Performed music six nights a week for the guests aboard the *Carnival Triumph*. Participated in weekly safety drills instructing passengers on how to wear life jackets and what to do during an emergency.

Jan 2003 – May 2004
University of New Orleans – Graduate Assistant – Monitored music computer lab. Installed workstations for new computer lab. Provided tech support for music computer labs. Directed small jazz ensembles each semester for undergraduate students.

Aug 2001 – July 2002
Trane Air Conditioning Company – Software Tester – Wrote and performed tests of a network interface card (NIC) to be installed in commercial rooftop air conditioning units. Tested input/output of the NIC as well as functionality of the air conditioning unit while receiving/sending commands via the NIC.

May 1999 – Aug 1999
Electric Power Board – Draftsman – Digitized pencil prints of substations. Corrected errors in prints. Trained one new employee in the use of MicroStation 95.

Publications

David Schwab and Li Yang. 2013. **Entity Authentication in a Mobile-Cloud Environment**, In *Proceedings of the Eighth Annual Cyber Security and Information Intelligence Research Workshop* (CSIIRW '13), Frederick Sheldon, Annarita Giani, Axel Krings, and Robert Abercrombie (Eds.). ACM, New York, NY, USA, Article 42, 4 pages. DOI=10.1145/2459976.2460024.

David Schwab, Li Yang, Katherine Winters, Matthew Jallouk, Emile Smith, and Adam Claiborne. **A Secure Mobile Cloud Photo Storage System**. *26th International Conference on Computer Communications and Networks (ICCCN 2017).*

Professional Presentations

Entity Authentication in a Mobile Cloud Environment, *Proceedings of the Eighth Annual Cyber Security and Information Intelligence Research Workshop*, Oak Ridge National Laboratory, TN, January 9, 2013.

A Secure Mobile Cloud Storage System, *Mid-SE Conference*, Gatlinburg, TN, November 11, 2016.

Relevant Courses Taught

Fundamentals of Computer Science, Data Structures and Program Design, Algorithm Analysis and Advanced Data Structures, Introduction to Operating Systems, File and Database Processing, Software Design and Development, Digital Logic and Introduction to Computer Hardware

Relevant Courses Studied

Digital Logic, Discrete Structures
Algorithms, Programming Languages, Compiler Construction
Intro to Database Management
DSP Hardware, Image Processing
Computer Networks, Client Server Systems
Operating Systems, Advanced Topics in Systems Software, Advanced Computer Architecture
Computer Graphics
Real-Time Embedded Systems, Microprocessors and Microcontrollers I and II
Automata, Complexity, and Computability
Advanced Biometrics and Cryptography, Computer Network Security
System Vulnerability Analysis and Auditing, Wireless Security
Computer Forensics
Introduction to Parallel Algorithms, Design and Analysis of Computer Algorithms
Numerical Analysis I and II
Deep Learning

ANNOTATED VITAE

Updated on May 17, 2018

Hong Qin, Ph.D.
Associate Professor, Computer Science and Biology
University of Tennessee Chattanooga
Google Scholar: http://tinyurl.com/zezo9d5
YouTube Educational Channel: http://youtube.com/c/hongqin
Open Notebook: http://hongqinlab.blogpsot.com
Data/Code Repositories: http://github.com/hongqin
Email: hong-qin@utc.edu

HIGHLIGHTS

- Developed a novel stochastic gene network model for cellular aging using probabilistic graphs.
- Successfully applied for 9 external grants as PI or co-PI with a total of ~1.6M, including 2015-2020 NSF CAREER award of $611K, 2015 NSF workshop grant of $41K, 2010-2013 NSF RUI grant of $293K, 2009-2010 NSF CCLI award of $110K.
- Rich research, teaching, advising, and service experiences in higher education.

EDUCATION

Ph.D. Biochemistry and Molecular Biology, University of Chicago, December 2001
Dissertation: Modular construction of RNase P. Advisor: Dr. Tao Pan

M.S. Computer Science, Loyola University of Chicago, May 2002
GPA 3.8, 30 credit hours. Completed projects using JAVA, C, C++, SQL and LISP.

M.S. Biophysics, Tsinghua University, China, May 1994
Thesis: Three-dimensional reconstruction of protein structures using EM and image processing techniques. Advisor: Dr. Sen-Fang Sui

B.S. Biological Sciences and Biotechnology, Tsinghua University, China, May 1991

Appointments

Aug 2016 – present	Associate Professor, Dept of Computer Science & Engineering, Dept of Biology, Geology & Environmental Science, and SimCenter, University of Tennessee at Chattanooga.
October 2017 – present	Adjunct Associate Professor, Dept of Internal Medicine, College of Medicine Chattanooga, University of Tennessee Health Science Center.
Sep 2015 – July 2016	Associate Professor with tenure, Department of Biology, Spelman College
Aug. 2009 – Aug 2015	Assistant Professor, Department of Biology, Spelman College
Jun.-Jul., 2013	Summer Sabbatical Fellow, University of Tennessee, Knoxville, National Institute of Mathematical and Biological Synthesis (NIMBioS)
Jun. - Aug., 2011	Visiting Faculty, Lewis Stigler Genome Institute, Princeton University

Jun. - Aug., 2010	Visiting Faculty (Undergraduate Faculty Research Residency), Fred Hutchinson Cancer Research Center, Seattle, WA 98109
Feb. 2007 - Aug., 2009	Assistant Professor, Tuskegee University, joint appointment between Department of Agricultural and Environmental Sciences, and Department of Biology
Jul.-Dec., 2006	Postdoctoral Associate, University of Tennessee, Knoxville Department of Ecology and Evolutionary Biology Advisor: Michael Gilchrist.
Jan. 2004 - Jun., 2006	Research Assistant Professor, University of Rochester Department of Biostatistics and Computational Biology
Oct. 2001- Dec., 2003	Postdoctoral Associate, University of Chicago Department of Ecology and Evolution Advisor: Wen-Hsiung Li.

HONORS AND RECOGNITIONS

- 2017, Faculty Mentoring Fellow, Quantitative Undergraduate Biology Education & Synthesis (QUBES)
- 2016, William A. Hinton Research Training Award, American Society for Microbiology.
- 2014 FASEB MARC faculty/mentor travel award for the 2014 Yeast Molecular Genetic Meeting.
- 2003 Travel award to attend the Gordon Research Conference on Evolutionary & Ecological Functional Genomics, NH, June 2003.
- 1991, Outstanding graduate, Tsinghua University.
- 1986, Highest score in college entry exam in a city with 4.5 million people.

SCHOLARSHIP

Peer Reviewed Publications

It is customary that the order of authors in a publication reflects the author's contribution to the research project in the field of computational biology. It is also customary that senior authors are placed as the last authors. Underlined authors were undergraduates.

1. Guven E, **Qin H**. The effect of Gaussian Noise on maximum likelihood inference of survival curves: A comparison of the Weibull and Gompertz models. Submitted, in review.
2. Guven E, Parnell LA, Jackson ED, Parker MC, Gupta N, Rodrigues J, **Qin H**. Hydrogen peroxide induced loss of heterozygosity correlates with replicative lifespan and mitotic asymmetry in Saccharomyces cerevisiae. PeerJ. 2016;4:e2671. doi: 10.7717/peerj.2671.
3. Pope WH, Bowman CA, Russell DA, Jacobs-Sera D, Asai DJ, Cresawn SG, Jacobs WR, Hendrix RW, Lawrence JG, Hatfull GF, Science Education Alliance Phage Hunters Advancing G, Evolutionary S, Phage Hunters Integrating R, Education, Mycobacterial Genetics C. Whole genome comparison of a large collection of mycobacteriophages reveals a continuum of phage genetic diversity. eLife. 2015;4. doi: 10.7554/eLife.06416. PubMed PMID: 25919952; PMCID: 4408529. (Qin is the leader of the Spelman College in the consortium)
4. Jiang Y, **Qin H**, Yang L. Using network clustering to predict copy number variations associated with health disparities. PeerJ. 2015;3:e677. doi: 10.7717/peerj.677. PubMed PMID: 25780754; PMCID: 4358638.
5. **Qin H**, Driks A. Contrasting evolutionary patterns of spore coat proteins in two Bacillus species groups are linked to a difference in cellular structure. BMC Evol Biol. 2013;13(1):261. Epub 2013/11/29. doi: 1471-2148-13-261 [pii]

10.1186/1471-2148-13-261. PubMed PMID: 24283940.

6. **Qin H**, Shapiro A, Yang L, editors. Emerging infectious disease: A computational multi-agent model. IEEE 2012 ASE International Conference on Biomedical Computing; 2012 Dec 14-16, 2012; Washington, D.C.
7. Guo Z, Adomas AB, Jackson ED, **Qin H**, Townsend JP. SIR2 and other genes are abundantly expressed in long-lived natural segregants for replicative aging of the budding yeast Saccharomyces cerevisiae. FEMS Yeast Res. 2011;11(4):345-55. Epub 2011/02/11. doi: 10.1111/j.1567-1364.2011.00723.x. PubMed PMID: 21306556.
8. Kravets A, **Qin H**, Ahmad A, Bethlendy G, Gao Q, Rustchenko E. Widespread occurrence of dosage compensation in Candida albicans. PLoS ONE. 2010;5(6):e10856. Epub 2010/06/17. doi: 10.1371/journal.pone.0010856. PubMed PMID: 20552010; PMCID: 2883996.
9. **Qin H**. Teaching computational thinking through bioinformatics to biology students. Proceedings of 40th ACM Technical Symposium on Computer Science Education. 2009:188-91.
10. **Qin H**, Yang L. Detection of changes in transitive associations by shortest-path analysis of protein interaction networks integrated with gene expression profiles. Proceedings of the IEEE International Conference on Biomedical Engineering and Informatics. 2008;1:418-23.
11. **Qin H**, Lu M, Goldfarb DS. Genomic instability is associated with natural life span variation in Saccharomyces cerevisiae. PLoS ONE. 2008;3(7):e2670. PubMed PMID: 18628831.
12. Gilchrist MA, **Qin H**, Zaretzki R. Modeling SAGE tag formation and its effects on data interpretation within a Bayesian framework. BMC Bioinformatics. 2007;8:403. PubMed PMID: 17945026.
13. **Qin H**, Lu M. Natural variation in replicative and chronological life spans of Saccharomyces cerevisiae. Exp Gerontol. 2006;41(4):448-56. PubMed PMID: 16516427.
14. Baird NJ, Westhof E, **Qin H**, Pan T, Sosnick TR. Structure of a folding intermediate reveals the interplay between core and peripheral elements in RNA folding. J Mol Biol. 2005;352(3):712-22. PubMed PMID: 16115647.
15. **Qin H**, Wu WB, Comeron JM, Kreitman M, Li WH. Intragenic spatial patterns of codon usage bias in prokaryotic and eukaryotic genomes. Genetics. 2004;168(4):2245-60. PubMed PMID: 15611189.
16. **Qin H**, Lu HH, Wu WB, Li WH. Evolution of the yeast protein interaction network. Proc Natl Acad Sci U S A. 2003;100(22):12820-4. PubMed PMID: 14557537.
17. **Qin H**, Sosnick TR, Pan T. Modular construction of a tertiary RNA structure: the specificity domain of the Bacillus subtilis RNase P RNA. Biochemistry. 2001;40(37):11202-10. PubMed PMID: 11551219.
18. **Qin H**, Liu Z, Sui SF. Two-dimensional crystallization of avidin on biotinylated lipid monolayers. Biophys J. 1995;68(6):2493-6. PubMed PMID: 7647251.
19. Liu Z, **Qin H**, Xiao C, Wen C, Wang S, Sui SF. Specific binding of avidin to biotin containing lipid lamella surfaces studied with monolayers and liposomes. Eur Biophys J. 1995;24(1):31-8. PubMed PMID: 7635091.
20. **Qin H**, Xie WZ, Chen HM, Sui SF. Study on interaction of avidin with biotin lipid monolayer. Chinese Science Bulletin. 1993;38:486-90.

Manuscript in preparation

1) **Qin H***.,* Estimating network changes from experimental lifespan data using a parsimonious gene network model of cellular aging. In preparation for BMC Systems Biology.
2*) Guven E,* **Qin H**, *Zhang J, The impact of humidity on gene expresson in the human skin. In preparation for Journal of Investigative Dermatology.*
3) Ghafari, M, Dang, W, **Qin H**, A greedy approach to infer cell divisions from time laspsed images.

Technical Report (non-peer reviewed)

1) **Qin H**., Report on network configuration and limiting modules in network aging. 2013.

This is the summary report for my summer sabbatical research on network aging at the National Institute for Mathematical and Biological Synthesis (NIMBioS).
Available at http://www.nimbios.org/ifiles/SB_qin_report.pdf.

Funding

EXTERNAL GRANTS (AWARDED OR PENDING)

- PI, NIH R15, "Invasive Growth Response to DNA Repair Stress in *Saccharomyces cerevisiae* Biofilms", ~$300K ($92K subaward to UTC), lead-PI A. Marz, Norfolk State University, submitted on Oct 25, 2017. Pending.

- PI, NSF IIS, "Spokes: MEDIUM: SOUTH: Collaborative: Integrating Biological Big Data Research into Student Training and Education", ~$550K, submitted on September 18, 2017. Pending.

- PI, NSF DBI "REU Site: ICompBio – Engaging Undergraduates in Interdisciplinary Computing for Biological Research". ~ $359K. Submitted on August 23, 2017. Pending.

- PI, NSF award #1602594. Conference: A strategic planning workshop to explore quantitative biology as a vehicle for broad participation. ~ $41K. Dec 15 2015 – Nov 30, 2016, awarded.

- PI, NSF MCB Award #1453078 (transferred to 1720215) CAREER: A probabilistic gene network model of cellular aging and its application on the conserved lifespan extension mechanism of dietary restriction. $611K, April 2015-March 2020, awarded.
  NSF CAREER award is a prestigious research award and its funding rate is especially low in the BIO Division.

- Co-PI, NSF, MCB, Problem-based learning modules for systems biology (PI, Eberhard Voit, Georgia Tech), $500K. Award #1517588, $500K ($58.9K to Spelman College), Aug 1, 2015- July 31, 2018, awarded.

- PI, FASEB MARC Faculty/Mentor Travel award. May 2014, awarded. ~$5.5K. Two Spelman students, Keyana Scott and Zhane Cruickshank, are co-applicants.

- PI, NIMBioS sabbatical fellowship. Summer 2013. ~$10K
  Applications for sabbatical fellowship at the National Institute for Mathematical and Biological Synthesis are reviewed rigorously by external experts.

- Fellowship, Quality Education for Minorities (QEM) Network, Faculty Development Program, 2011~2012. ~$30K

- PI, NSF MCB "RUI: Testing the network hypothesis of cellular aging in *Saccharomyces cerevisiae*." Award #1022294, September 1, 2010 – August 31, 2013, $293K. NSF MCB program usually funds 10~15% of the submitted proposals. This proposal was rated as high priority by the panel.

- Co-PI, "Simulating the transmission of infectious disease". Collaborative Research Experience for Undergraduates, (PI Li Yang, co-PI, Nagambal Shah) $23K. 2010-2011

- PI, NSF "CCLI: Teaching computing in life sciences through hands-on experience at Tuskegee University", Award #0837075, Jan 2009- Dec 2010, $110K. NSF CCLI program usually funds ~15% of the submitted proposals.

INTERNAL GRANTS, SUBMITTED OR AWARDED

- CoPI, "Center for Collaborative Technology Enhanced Solutions to Enhance Diversity in STEM", PI Jennifer Ellis, CoPI Neslihan Alp, $98.8K
- PI, UC Foundation, "Building a repertoire of case studies and video tutorials to enhance interdisciplinary machine learning education and engage with the community". CoPIs Hemant Jain, Yu Liang, Dalei Wu. $96K, submitted on January 2018.
- PI, CEACSE, "Connecting control theory in engineering to a network theory of aging in biology", University of Tennessee Chattanooga, ~$90K, February 2017. Co-PI, Dr. Craig Tanis.
- Co-PI, CEACSE, "Development and application of computational tools to address fundamental questions in ecology and evolution", University of Tennessee Chattanooga, $89K. February 2017. PI Dr. Hope Klug. Co-PI Dr. Jennifer Boyd.
- PI, Spelman Small Faculty Development Fund, travel to attend Cold Spring Harbor Laboratory-Asia conference, $2K, Fall 2013
- PI, Spelman CHDRE/RIMI seed grant, "Develop Functional Assays in Yeast Cell for Studying Genes Associated with Diseases at Higher Rates in African Americans", $10K, 2012
- PI, Spelman ASPIRE, "The Bacillus Genome Database", $10K, 2010-2011.
- PI, Spelman Small Faculty Development Fund, purchasing a copy of Mathematica, ~$1.2K, 2010
- PI, Spelman Small Faculty Development Fund, travel to attend American Society for Microbiology annual meeting, ~$1.5K, 2009
- PI, Pilot grant from the Nathan Shock Center for Excellence in the Basic Biology of Aging, titled "Comparative genetics of yeast lifespan variations". 2004-2006, $75K.
- PI, Fellowship, the Glenn Foundation for Medical Research, University of Rochester. "Genetic mechanisms of yeast life span regulation", 2005-2006, $50K.

HIGH PERFORMANCE COMPUTING GRANTS, AWARDED

- PI, XSEDE Start up allocation. 50,000 CPU Hours at the Blacklight Computing Cluster, 100,000 CPU Hours at the Open Science Grid (osg.xsede.org). 2014-2016
- PI, XSEDE Educational allocation. 40,000 CPU Hours at the Gordon Computing Cluster, Fall 2015. This allocation allows BIO386 students to work on parallel computing projects.

EXTENAL GRANTS SUBMITTED BUT NOT FUNDED

- Co-PI, NSF DRL "Exploratory: STEM ICE: Inspire, Communicate, Educate", ~$356K, submitted on Sep 1, 2017.
- PI, NIH R01, "Connecting emergent aspect of gene networks to cellular aging", $3.3M. submitted on October 7, 2016.
- PI, NSF REU Site: IComputeB^2 – Engaging undergraduates in interdisciplinary computing for biological and biomedical research. $321K. Submitted in August 2016.
- PI, NSF, CAREER: Emergence of cellular aging from gene networks in *Saccharomyces cerevisiae*. July 2012 and July 2013, ~$850K.
- PI, NSF, MRI: Acquisition of an image flow cytometer for mentored undergraduate research at Spelman College. Co-PIs: Victor Ibeanusi, Kimberly Jackson, and Mark Maloney. January 2012, $690K.
- PI, Collaborative Research Experience for Undergraduates, Simulating cellular aging using reliability models, 2011, $10K

- PI of the Spelman component. The PHAGE Galaxy: A Consortium for Phage Hunting and Genomics Education for Undergraduates, NSF TUES Phase 3 proposal. (PI, Louise Temple-Rosebrook, James Madison University), 2011.
- Co-PI, Department of Energy, Assessment of Microbial Remediation of Non-Radioactive Metals Using a Combined GIS-Based and Artificial Neural Networks as a Predictive Environmental Decision Support System (PEDSS), (PI, Victor Ibeanusi), $2 million, 2010
- Co-PI, Department of Defense, Proteomic analysis of the Microbial-Mediated Biodegradation of Munitions Wastes. (PI, Victor Ibeanusi), $2 million, 2010
- PI, Roche 10G grant, "Sequencing the fountain of youth in yeast genomes", $100K, 2008.
- PI, NIH/NIA R21, "A Genetic Study of Yeast Natural Lifespan Variation", $414,818, 2005
- PI, AFAR, "Genetic Determinants of Lifespan in Natural Yeast Populations", $50K, 2004

RECENT INTERNAL GRANTS, DECLINED

- PI, CORNET, "Using Recurrent Neural Networks to Infer Regulatory Gene Networks from Time Series Gene Expression Measurements", University of Tennessee Chattanooga, $25K, February 2017.

Invited Talks

1) University of Tennessee Chattanooga, SimCenter, February 17, 2017
2) University of Tennessee Chattanooga, Department of Chemistry and Physics, Jan 20, 2017
3) University of Tennessee Chattanooga, Department of Mathematics, Oct 28, 2016
4) University of Tennessee Chattanooga, Department of Biology, Geology, and Environmental Science, Sep 22, 2016
5) University of Tennessee Chattanooga, College of Engineering and Computer Science, Nov 13, 2015.
6) Georgia State University, Department of Computer Science, Sep 11, 2015. Host Yi Pan.
7) Emory University, Department of Biostatistics and Bioinformatics, Sep 18, 2014. Host Steve Qin.
8) University of Georgia, Department of Plant Biology, Sep 15, 2014. Host Wolfgang Lukowitz.
9) Emory University, Department of Physics, Oct 8, 2013. Host Minsu Kim.
10) Soochow University, Center for Systems Biology, China, September 11, 2013. Host Bairong Shen.
11) Nanjing University, Institute of Biophysics, China, September 4, 2013. Host Feng Liu.
12) Georgia State University, Dr. Peng George Wang's group, Dept of Chemistry, May 2, 2013
13) Georgia State University, Dept of Mathematics & Statistics. March 29, 2013. Host Yi Jiang.
14) Princeton University, Dept of Molecular Biology. July 29, 2011. Host David Botstein.
15) Talk, AXA meeting on aging, University of Paris, October 8, 2009. Invited by François Taddei.
16) INSERM (French Medical Research Council), Mar 25, 2009. Host François Taddei.
17) University of Tennessee at Knoxville, March 16, 2009.
18) Alabama State University, Dept of Biology, February 24, 2009.
19) University of Cincinnati, Dept of Environmental Heath, Jan 29-30, 2009.
20) Roger Williams University, Dept. of Biology, Mar. 2008.
21) Clemson University, Dept. of Biochemistry and Genetics, Dec. 2006.
22) Tuskegee University, Dept. of Biology, Oct. 2006.
23) SUNY-Buffalo, Dept. of Biochemistry. Apr. 2006.
24) The Institute of Genome Research, Jan. 2006.
25) University of Indiana at South Bend, Dept. of Biological Science, Jan. 2005.
26) University of Rochester, Center for Aging, Jul. 2003.
27) Stanford University, Stanford Genome Technology Center. Jul. 2003.
28) Washington University at St. Louis, Dept. of Genetics. May. 2003.

29) University of Rochester, Dept. of Biology. May. 2003.
30) National Center for Biotechnology Information. Feb. 2003.

Conference Presentations

1) Poster, UT CORNET Cancer conference, Murfreesboro, November 9, 2016
2) Poster, 2016 the allied genetics conference, Orlando, FL. July 13-17, 2016.
3) Poster, the 9th Q-bio meeting, Blacksburg, VA, August 5-8, 2015
4) Poster, Annual meeting of Society of Mathematical Biology, Atlanta, GA. June 30-July 3, 2015.
5) Poster, Georgia Academy of Science Meeting, Georgia Regents University, March 28-29, 2014.
6) Poster, Georgia Tech Bioinformatics meeting, Georgia Tech, November 7-9, 2013
7) Poster, CSH-Asia, Molecular Basis of Aging and Diseases, Suzhou, China, September 9-13, 2013.
8) Poster, International Computational Cell Biology, Virginia Tech, August 14-16, 2013
9) Spotlight poster talk, Q-bio, Santa Fe, New Mexico, August 7-10, 2013.
10) Talk, Frontiers in Systems and Synthetic Biology'13, (FSSB'13), Georgia Tech, March 20-24, 2013.
11) Poster, 20th Annual Southeastern Regional Yeast Meeting, University of Alabama at Birmingham, March 8-10, 2013.
12) Poster, Annual meeting of Yeast Genetics and Molecular Biology, Princeton, August 2012.
13) Talk, Annual meeting of Society of Mathematical Biology, Knoxville, TN, July 2012.
14) Talk, 19th Annual Southeastern Regional Yeast Meeting, Emory University, February 24-26, 2012.
15) Poster, Computational Cell Biology, Cold Spring Harbor Laboratory, Mar 29 - Apr 1, 2011.
16) Poster, Southeastern Population Ecology & Evolutionary Genetics Meeting, October 2009.

Research Conference Presentations by Undergraduate Students

International conferences outside of U.S.

1) Alice Story, July 26-30, 2011, Kyoto, Japan. The annual meeting of the Society for Molecular Biology and Evolution (SMBE).
   Ms. Story was a winner of travel awards (Only ten students worldwide were selected).
2) Corin White, July 27-August 1, 2010, Vancouver, British Columbia, Canada. Poster presentation at the Annual International Yeast Genetics & Molecular Biology Meeting.
   Ms. White was a winner of travel fellowship to attend this international meeting.

INTERNATIONAL, NATIONAL, AND REGIONAL, CONFERENCES IN U.S.A.

1) Kathryn Rouse, Undergraduate Research Conference, National Institute of Mathematical and Biological Synthesis.
2) Kathryn Rouse, the Southern Conference Academic Exchange (SoCon) Undergraduate Research Forum, Oct 27-29, 2017. Miss Rouse receive an undergraduate travel award from UTC.
3) DeAndra Jones, Emerging Researchers National (ERN) Conference in STEM, Washington, DC, February 19-21, 2015. Miss Jones won a competitive travel award to attend this conference.
4) Keyana Scott, Undergraduate Research Conference at NIMBioS, Knoxville, TN, November 1-2, 2014.
5) Brittany A Jackson, talk, Annual meeting of Georgia Academy of Sciences, Georgia Regents University, March 28-29, 2014.
6) Amanda Alexander, poster, Frontiers in Systems and Synthetic Biology'13, (FSSB'13), Georgia Institute of Technology, March 20-24, 2013.
7) Palpasa Manandhar, poster, Frontiers in Systems and Synthetic Biology'13, (FSSB'13), Georgia Institute of Technology, March 20-24, 2013.
8) Ashlee Beverett, poster, Albany State University 2012 Regional Undergraduate Research Symposium, October 2012.
9) Lindsay Parnell, February 24-26, 2012, 19th Annual Southeastern Regional Yeast Meeting (SERYM), Emory University. Oxidative stress and genomic instability.

10) Janella Wynter, February 24-26, 2012, 19th Annual Southeastern Regional Yeast Meeting (SERYM), Emory University. Network robustness and cellular aging.
11) Lindsay Parnell, ABRCMS, Nov 2011, St. Louis. Oxidative stress and genomic instability.
12) Janella Wynter, ABRCMS, Nov 2011, St. Louis. Network robustness and cellular aging.
13) Shyla Hardwick, ABRCMS, Nov 2011, St. Louis. Survey of life span variation in yeast.
14) Alice Story, Spring 2011. The interconnection of molecular evolution, gene network, and cellular aging. Poster presentation at Southeastern Ecology and Evolution Conference, Auburn, AL.
15) Shyla Hardwick, summer, 2010, HHMI Phage symposium, Janelia Farm Research Campus, Ashburn, VA.
16) Kenee Daffin, Spring 2010, Effects protein electrostatic property on Protein-Protein Interactions in the Yeast. Poster presentation at the 2010 Southeastern Ecology and Evolution Conference. Georgia Tech, Atlanta, GA.

Research Conference Presentations by Graduate Students

1) Mehran Ghafari, the 12th LFD Workshop in Advanced Fluorescence Imaging and Dynamics, University of California, Irvine. October 23-27, 2017.
   Mr. Ghafari is a recipient of a student award that paid for the workshop registration.

Reviewing Service

PANEL REVIEWER

- NSF review panels, October 2010, April 2011, August 2012, April 2013, March 2015, March 2016, March 2017, and March 2018 (scheduled).
  I was assigned 10-12 proposals and participated in the deliberation of 40~60 proposals in the full-proposal panels. For the pre-proposal panel, there were ~20 assignments and discussions of ~120 pre-proposals.

AD HOC REVIEWER

- Quantitative Biology, April 2017.
- Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS), October 2016
- ACM MidSE 2016, September 2016 (Three proposals).
- NSF MCB ad hoc reviewer, 2016.
- Mathematical Bioscience and Engineering, November 2015.
- Journal of Theoretical Biology, November 2015.
- PLOS ONE, October 2015.
- International Journal of STEM Education. May 2015.
- Maryland Industrial Partnerships Program (http://www.mips.umd.edu) November 2014.
- BMC Genomics, June 2012.
- NSF Chemical Biology, September 2011. NSF Mathematical Biology, February 2011.
- Current Medicinal Chemistry, July & August 2009, November 2011, June 2012.
- The 3rd International Symposium on Bio- and Medical Informatics and Cybernetics, BMIC 2009, invited reviewer.
- International Conference on Intelligent Computing, Shanghai, 2008, invited reviewer.
- Genetics, 2005. PNAS, 2005 and 2003.
- Bioinformatics, 2004. Journal of Molecular Evolution, 2003.

External Consulting

- External evaluator, Fort Valley State University, Grant proposal on bioinformatics education. May 2015. Invited by Dr. Ramana Gosukonda.
- External consultant, Aging & Energetics Strategic Planning Meeting, University of Alabama at Birmingham, Feb 13, 2012. Invited by Dr. David Alison.
- External collaborator, STEM program, Dillard University. Invited by Dr. Lovell Agwaramgbo. Spring 2012 and 2014.

Open Research Practice

- Open Research Repository, http://github.com/hongqin/.
- Open Notebook, http://hongqinlab.blogspot.com/ .

Professional Training Courses Completed

- Big Genomic Data Skills training for Professor, Jackson Laboratory for Genomic Medicine, Farmington, CT. May 15-19, 2017
- Next Generation Sequence on-line training course offered by bioinformatics.org, May 2012. This is a one-week course on the state-of-the-art computing tools for NGS data analysis.
- Computational Cell Biology course, CSHL, July 1 ~ July 21, 2011.
  This three-week course focuses on the mathematics of dynamical systems, computational simulation techniques, cell biology and molecular biology. Topics include bifurcation analysis, calcium signaling modeling, cell cycle modeling, and synthetic gene networks.
- R Bioconductor training course on genomic data, FHCRC, Seattle, WA, April 27-20, 2009.
- 13th Summer Institute in Statistical Genetics, Seattle, WA, June 2008.
  I completed modules on Computing for Statistical Genetics, MCMC for Genetics, Human Population Genetics Data Analysis, Coalescent Theory, and Advanced QTL Mapping.

Professional Workshops/Meetings Organized

- Co-organizer: Finding your inner modeler. July 2017, scheduled.
  This is an NSF sponsored workshop for computational modeling for cell biology with 30 faculty participants expected. The lead-PI of this workshop is Dr. David Stone, University of Illinois at Chicago.

- Organizer. Atlanta QBIO workshop-A vehicle for broadening participation, March 11-12, 2016
  I was the PI and the lead-organizer of this faculty workshop with over sixty participants from 17 universities and colleges.

- Organizer. Software Carpentry Programming Bootcamp, Spelman, June 10-11, 2014.
  I organized this Python programming workshop with 37 participants attended, including 10 Spelman faculty and ~10 Spelman students. Other participants come from Morehouse Medical School, Emory University, and Georgia State University. Instructors of this bootcamp were supported by BEACON of Michigan State University, a funding source that I helped arranged. I also applied for Spelman internal fund for refreshment and made logistics arrangements. I worked as a TA during the bootcamp.

- Instructor. Using R in classroom and undergraduate research, Georgia Academy of Science Annual meeting, Augusta, March 29, 2014
  I presented my teaching experience to ~6 faculty participants from at least 3 institutions.

- Guest instructor. Computational biology for biology educators, Oak Ridge, July 25, 2013
  I presented teaching experience to 12 faculty participants from various institutions.

- Instructor. Workshop on computational genomics, Lewis & Clark College, December 3, 2010
  I was invited to share my experience of teaching computing to ~5 faculty participants.

- Instructor. Workshop on gene expression data analysis, Delaware State University, February 2010.
  I was invited to teach gene expression analysis to ~15 graduate and undergraduates.

- Organizer. Integrating Computing into Student Learning and Research, Tuskegee University, May 11-13, 2009.
  38 faculty participants. Two external speakers were invited.

- Instructor. Workshop on protein structure informatics, Alabama State University, February 24, 2009

Professional Meetings Attended

- Biodiversity Big Data Workshop, Smithsonian Institute, December 14-15, 2017
- "21st Century Cures: Southeast Conference", University of Tennessee Knoxville, June 1, 2017
- QCB workshop, Cells as Dynamical Systems, UCSF, May 22-23, 2017
- Workshop on Biological Big Data and Artificial Intelligence, Georgia Tech, December 13-14, 2016
- UT CORNET Cancer conference, Murfreesboro, November 9, 2016
- Regional workshop by the National Institute of Aging, Morehouse School of Medicine, Oct 20, 2016
- High impact applications of data science in precision medicine, health analytic, and health disparities, Georgia Tech, Sep 19-20,2016
- Cyberbridges workshop, Washington, DC, August 31-September 1, 2015
- Workshop on advancing computational science education in minority serving institutions at the Southeastern Universities Research Association, Washington, DC, Oct 20-11, 2014
- XSEDE 2014 annual meeting, Atlanta, GA. July 14, 2014.
- Atlanta Area Molecular and Cellular Biophysics Symposium, Emory University, Dec 7, 2013.
- ASE Biomedical Informatics, Washington DC, Dec 14-15, 2012.
- International Conference on Intelligent Biology and Medicine, Vanderbilt University, Nashville, TN, April 22-24, 2012.
- Annual meeting of Georgia Academy of Science, Kennesaw State University, March 25, 2012
- Quality Education for Minorities (QEM) workshop on summer research, Baltimore, August 4-5, 2011.
- Quality Education for Minorities (QEM) workshop on summer research and project evaluation, Baltimore, May 20-21, 2011.
- National Science Foundation workshop on Career proposals, Albuquerque, NM, January 28-29, 2011
- Bioconductor Developer Day and Bioc2010 workshop on genomic data and flow cytometry, Fred Hutchinson Cancer Research Center (FHCRC), Seattle, WA, , July 28-30, 2010.
- National Science Foundation Joint Annual Meeting, Washington, DC, June 6-9, 2010.
- General Meeting of American Society for Microbiology at San Diego, CA, May 23-27, 2010.
- American Society for Microbiology workshop on microbial genomics, May 23, 2010.
- SouthEastern Population Ecology and Evolutionary Genetics (SEPEEG), October 16-18 2009, Dahlonega, GA.
- AXA workshop - A systems approach to individual differences in longevity, Paris, Oct 7-9 2009.
- Society of Molecular Biology and Evolution, Iowa City, IA, June 3-7, 2009.

- Bioconductor workshop, Fred Hutchison Cancer Research Center, Seattle, WA, April 27-20, 2009
- ACM SIGCSE, Chattanooga, TN, March 4-7, 2009
- BioQuest curriculum workshop, SCOPE, and Numbers Count, Atlanta, GA, January 7-11 2009
- Poster, Southeastern Population Ecology and Evolution Genetics, Easton, GA, Oct 2008
- Fifth annual conference, Transforming East Alabama Mathematics, Tuskegee, AL, Sep 2008
- Society for Conservation Biology Conference, Chattanooga, TN, July 2008
- 13th Summer Institute in Statistical Genetics, Seattle, WA, June 2008 (Modules on Computing for Statistical Genetics, MCMC for Genetics, Human Population Genetics Data Analysis, Coalescent Theory, and Advanced QTL Mapping)
- The 46th ACM Southeast Conference, Auburn AL, March 2008,
- Open Science Grid computing workshop organized by U of Chicago, Tuskegee, Feb 2008
- Georgia Tech Bioinformatics Conference, Atlanta, Nov 2007
- NSF grants application workshop, Oak Ridge, Apr. 2007.
- Talk, Southeastern Ecology and Evolution Conference, University of Central Florida, Mar. 2007.
- Talk, Southeastern Population Ecology and Evolutionary Genetics Conference, SC, Sep. 2007.
- Poster Annual Yeast Genetics Conference, Princeton, Jul. 2006.
- Talk, SMBE annual conference, Arizona, Jun. 2006.
- Poster, Molecular Genetics of Aging, CSHL, Oct. 2004.
- Talk, GRC conference on Evolutionary & Ecological Functional Genomics, NH, Jun. 2003.

Professional Memberships

- Society of Industrial and Applied Mathematics (SIAM), 2012-present.
- Genetics Society of America (GSA), 2003, 2010, 2014.
- Society of Mathematical Biology (SMB), 2013, 2015
- Society for Molecular Biology and Evolution (SMBE), 2006, 2013.
- American Society for Microbiology (ASM), 2010.
- Bioinformatics Organization (Bioinformatics.org), 2001~2009.
- Mentee of the Mentoring Program in Biology Division, Council on Undergraduate Research. (Mentor, Louise Temple, James Madison University) 2009-2011.

TEACHING

Courses Taught at University of Tennessee at Chattanooga (Since Fall 2016)

Spring 2018:
- CPSC 1100 Fundamental of Computer Science.
- BIOL 3250 Genetics.

Fall 2017:
- CPSC 1100 Fundamental of Computer Science, 24 students. Online course. Student rating 6.02 out of 7 for the section on instructor.
- CPSC/BIOL4999, CPSC5910R Introduction to Computational Genomics. 16 students. Student rating 6.3 out of 7 (weighted averaged over the three cross-listed courses).

Spring 2017:
- CPSC 1100 Fundamental of Computer Science, 17 students. Student rating 6.8 out of 7.
- BIO 3250. Genetics, 37 students. Student rating 5.8 out of 7.

Fall 2016:

- CPSC 5210 Design and Analysis of Computer Algorithms, 21 students. Student rating 5.7 out of 7.
- BIO1110L. Introduction to Biology, Laboratory. 24 students. Student rating 4.9 out of 7.

Courses Taught at Spelman College (Fall 2009 – Spring 2016)

Primary Teaching Assignments:

- BIO125 Molecular Biology & Genomics. Spring 2013 - 2016.
- BIO233 Microbiology including laboratory. Fall 2009 - 2011, Spring & Fall 2014, Fall 2015
- BIO386/BIO320 Genomics, Proteomics and Bioinformatics. Spring 2010-2012, Fall 2014-2015.
- BIO487 Undergraduate Research, offered nearly every semester in 2009~2016.
- First Year Experience, 2011-2016.
- CIS 115 Introduction to Informatics & Computing. Fall 2012, Spring 2013.
- BIO380 Critical Thinking in Biology. Spring 2013.
- BIO491i Applied Bioinformatics. Spring 2010.

Guest Lectures:

- BIO471, Molecular and Cellular Biology. Guest lectures on protein structures. Fall 2011.
- CHN345, Understanding Modern China. Guest lectures on human genetics and food cultures. Spring 2013.

Courses Taught at Tuskegee University (February 2007 – Spring 2009)

- BIOL0368. Introduction to Bioinformatics, fall 2007 and 2008
- BIOL0595 Computing in Life Sciences, spring 2008, 2009.
- BIOL202 Mathematics, Computers, and Biosciences, co-instructor, fall 2007 and 2008.

Educational Training, Workshops and Conference attended.

- Oral presentation, "Make student thought process visible through screencast", Teaching workshop, College of Engineering and Computer Science, UTC Oct 4, 2017
- Quality Matters online training course, "Applying the QM Rubric (APPQMR)", September 26 – October 11, 2017. This is two-week intensive online training course.
- Talk, 2017 BioQuest meeting, "Making Meaning through Modeling: Problem solving in Biology", Michigan State University, July 23-28, 2017.
- Talk, "Let student think out loud through YouTube", Instructional Excellence, University of Tennessee at Chattanooga, May 10, 2017
- How to integrate self-regulated learning into your courses. Webinar, June 24, 2014.
- XSEDE tutorial workshop on Computational Thinking Education, Spelman, April 21, 2014.
- NIMBioS tutorial workshop for Mathematical Modeling for Cell Biology, UTK, April 8-10, 2013.
- Presentation on developing YouTube tutorial videos at the Active Learning Pedagogies: Promoting Access & Mastery in the STEM Disciplines, PKAL Atlanta Regional Network Fall Meeting, Atlanta, GA, Nov 16, 2012.
- Panelist at the Spelman Faculty Retreat, "Intro to Computer Science in the Informatics Age", Atlanta, GA, May 17, 2011.
- Joined the Council for Undergraduate Research (CUR) mentorship program, 2009-present. (Mentor, Louise Temple from James Madison University, VA).
- Attended the HHMI National Genomics Research Initiative workshop, December 14-18, 2009, Janelia Farm, VA.
- Presentation on teaching genomics at the InterLink conference, Spelman, spring, 2010.
- Attended the iPlant workshop on teaching genomics, Spelman, spring 2010.

- Attended the Research Coordination Networks (RCN) workshop at Emory University, May 15, 2010.
- HHMI phage genomics training workshop, Washington, D.C., Dec 14 -18, 2009
- Bioquest-ScaleIT, University of Tennessee, Knoxville, TN, June 22-26, 2009

Curriculum Development

- Developed an Experience Learning Component in CPSC/BIOL4999 Introduction to Computational Genomics. Students are guided to analyse authentic data sets to test their hypotheses using rigorous statistical and computational methods, write manuscript-styled reports, and revise their writings in response to critiques. CPSC/BIOL4999 is approved as a ThinkAchieve course in October 2017 at UTC.

- Integrating ScreenCast to enhance student learning of programming and computational methods at UTC, Fall 2016 ~present. My experiences showed that ScreenCast is an effective way for online programming and computing education. Sample student videos can be seen at http://tinyurl.com/y6u4r7qb.

- Developed video tutorials for Java programming at UTC, Fall 2017.
  Sample videos can be seen at http://tinyurl.com/y6wnhsne.

- Developing active learning activities for teaching Algorithm at UTC, Fall 2016.
  Sample activities can be seen at https://youtu.be/aDgv00pwIs0, http://tinyurl.com/j38e2rz and http://tinyurl.com/hanfpmb. Students are guided to develop their own video presentations on algorithms for homework assignments.

- Development of a computational biology course as Course-based Undergraduate Research Experience at Spelman College, 2010-2016.
  I designed BIO386 Genomics, Proteomics, and Bioinformatics to be a project-based, computing-oriented, and writing intensive research course. One of my key innovations in this course is *research paper reconstruction*: students are guided to reanalyze the data and regenerate the figures in published papers in high-profile journals (such as Science, Nature, and PLOS Biology) to empower students and strengthen their confidence. I developed all the materials in this course. The course contents, slides, computer exercises, and codes are available at https://github.com/hongqin/RCompBio/. My YouTube education channel for this course is: https://www.youtube.com/playlist?list=PLA54E692040796EA5.

- Molecular Biology and Genomics (BIO125), 2012-2016.
  I am a lead instructor of BIO125 and designed many bioinformatics and computational exercises for this course. I also revised the protocols of this yeast MSH2-project based research course. The data that I curated for student exercises can be found at https://github.com/hongqin/SBIO125. My YouTube education channel for this course is https://www.youtube.com/playlist?list=PLo62Vf9IYqhp49ePJZ-I8XDkiupkhsYrp.

- Microbiology (BIO233), 2009~2016
  I updated this course with state of the art components of microbial genomics, phylogenetics, synthetic biology, and bioinformatics. One emphasis of this course is to train students to be problem solvers. I used *investigative problems and exams* in this course: students are taught to solve problems through independent open investigations. Another emphasis is to give hands-on learning experiences to students. Practical exams were used to improve student engagements in learning laboratory skills. I integrated basic microbiology labs like Gram stain with

environmental sampling, followed with quantitative I integrated wet-bench lab with quantitative work, and led students to analyze their own data using Excel or R. Students also learned to generate and interpret phylogeny, perform sequence similarity analysis, and examine protein structure using *SWISS PDB Viewer*. My YouTube channel for this course is: https://www.youtube.com/playlist?list=PLo62Vf9IYqhqPVzSdecVcXfKvIFVZ2l4R.

- Introduction to Computing and Informatics (CIS115), spring of 2011 and 2012.
  This course taught Python-based programming skills and computational thinking to students. I developed computer labs and projects for bioinformatics and computational biology, using real-world biological data and examples.

- Modules on genetic and food culture in CHN345 Understanding Modern China. Spring 2012.
  These modules were developed for the Spelman Food Studies program, in collaboration with Dr. Zhenbin Lu.
  I explained the genetics of lactose intolerance in Eastern Asian populations and the evolution of lactase persistence in European populations.
  Dr. Lu compared social and cultural factors behind differences in food cultures such as tofu versus cheese, and chopsticks versus forks.
  We also explored the mutation in aldehyde dehydrogenase 2 family (ALDH2) in Eastern Asian populations, and its possible links to the differences between East and West drinking cultures.

Online Teaching Materials Developed

I devote myself to developing effective teaching materials using the state-of-the-art online technologies. These materials are tailored for the learning style for the millennial generation students, and enable them to learn beyond the classroom settings.

- YouTube Educational Channel (Spring 2012 ~ present)
  To facilitate student self-paced learning, I recorded my lectures and computer demos. These video lectures are posted on YouTube http://youtube.com/c/hongqin .
  My educational channel has over 260,000 views with over 500 subscribers. My popular educational videos include "Covert Excel file to csv and read into R", "How to use R match function", "Principle of site-directed mutagenesis by PCR" , "BD FACS Calibur, Cell Quest Training", and "Hierarchical clustering by hclust in R on a distance matrix". The codes and data for my YouTube tutorials are often provided in my GitHub repositories, so that students can learn on their own.

- Pedagogical research on teaching computational biology (2007 ~ present).
  I have spent ~10 years in developing course materials, lab exercises, manuals, instructional support, and online writings on teaching computing to biology students.
  2007-2012: http://bioinformatics.org/ctls/ ,
    I developed this web site as a resource for teaching computing in biology. The site is the No. 1 ranked site by Google for computational thinking in biology in 2009-2011. This site contains course material on computational biology and bioinformatics, including lecture slides, modules, lab exercises, data sets, etc.
  2013-present: http://Github.com/hongqin
    Since 2013, I switched my online host to GitHub because it provides better technological support. Github is also more effective for me to collaborate with students on projects.
  Course impacted: CPSC/BIOL 4999, BIO386/BIO320, CIS115, BIO233, BIO491i.

- Online teaching blog at http://hongqinlab.blogspot.com/ (Fall 2012~present)
  For almost every lecture and lab that I have taught, I recorded progress, student engagement, and successful and unsuccessful components. I have kept this self-reflective practice for years. Recently I started this practice online. For team-taught courses such as BIO125, my blog has become an important reference for course planning and revision.
  Course impacted: BIO125, BIO233, BIO386

Students and Postdocs Mentored at University of Tennessee at Chattanooga

2017 ~ 2018 (5 undergraduates, 4 MS & 1PhD students, 1 postdoc)

- Kathryn Rouse, undergraduate, Honors College. Network aging.
- Brittany Dugger/Thomas, undergraduate, computational genomics.
- Victoria Mak, undergraduate, computational genomics
- Zaihab, Bukhari, undergraduate, computational genomics
- Mehran Ghafari, Ph.D. candidate, biomedical image analysis.
- Haobo Guo, Postdoc, computational genomics.
- Zach McCoy, graduate student, ecological networks and big data
- Caleb Powell, undergraduate, plant image big data and mobile data collection
- Jonah Hall, graduate student, geospatial big data
- Lawrence Taylor, graduate student, develop software package for network analysis.
- Alex Hagman, graduate student, machine learning on cancer drug responses

2016 ~ 2017 (4 undergraduates, 3MS & 1 PhD students, 1 postdoc)

- Stephen Clark, undergraduate, Honors College. Metric proficiency study at UTC.
- Kathryn Rouse, undergraduate, Honors College. Network aging.
- Brittany Dugger, undergraduate, computational genomics.
- Stephanie Honore, master student, computational genomics, web server.
- Thomas MacKenzie, master student, computational genomics, fall 2016
- Niket Jaiswal, master student, Database and web server design.
- Kierra Parker, undergraduate, Honors thesis. Metric proficiency study at Spelman College.
- Mehran Ghafari, Ph.D. candidate, biomedical image analysis.
- Emine Guven, Postdoc, computational genomics.

Undergraduate Research Projects Mentored at Spelman College

I mentored over seventy students to conduct research projects at Spelman College, including three honors theses. At least 9 of these research students have gone on to pursue PhD training in STEM, and 2 has completed her PhD.

2015 ~ 2016 (15 undergraduates)

- Maya Jones, RISE, Differential gene expression in cisplatin treated ovarian cancer cell lines
- Keyana Scott, independent study, network robustness and cellular aging.
- Jessica D Corley, HHMI scholar, role of network configuration on aging.
- Taylor Williams-Hamilton, independent study, aging and stem cells.
- Faith J Lyons, HHMI scholar, aging related human diseases.
- Maya Bryant, Computational study in gene robustness using gene expression data.
- Camrie J Hendking, Honor research student. Aging and human diseases.
- Mason Dana, Justice Echols, Kierra Parker, Faith Kirkland, Erin Johnson, Imani-Michelle White, Bongeka Zuma, Michala Mercer, Christina Fennell in BIO386 research course.

2014 ~ 2015 (6 undergraduates)

- DeAndra Jones, Mathematical evaluation of yeast longevity genes.
  Miss Jones won an travel award to attend the Emerging Researchers National Conference in STEM at DC in Spring 2015.
- Keyana Scott, ASPIRE summer scholar, BIO386. Network robustness and cellular aging.
- Courtney Lett, Math RAMP. Effect of network configuration on the aging dynamics.
- Kayla Moore, RISE scholar. Flow cytometry study on oxidative stress and aging.
- Maya Kirkland, RISE scholar. Maximal likelihood analysis of yeast lifespan.
- Zhane Cruickshank, BIO386. Network robustness and cellular aging.

2013~2014 (10 undergraduates)

- Brittany Jackson, Math RAMP. Network configuration and cellular aging.
- Mislie C Jean-Baptiste, independent study. Using network clustering to predict copy number variations associated with health disparities.
- Ashlee Beverett and Ariel Harden, Bio233 project. Genetic variation and yeast oxidative stress responses. *Miss Ariel Harden is a second place winner of poster presentation on Spelman Research Day*.
- Deja Heckard and Kaitlyn Jackson, Bio233 project. Genes associated with pathogenicity in yeast.
- Cayla Lowe and Corinthia Wilkerson, Bio233 project. Freshly made or processed: A microbial look at orange juice and lemonade.
- Anique Thompson and Tara Martin, Bio233 project. Kilometers or miles: Should it matter?

2012~2013 (11 undergraduates, including 1 honors thesis)

- Amanda Alexander (Math RAMP), statistical genomics. **Honors thesis.**
  Miss Amanda Alexander is the Class of 2014 valedictorian.
- Palpasa Manandhar (Math RAMP), reliability network modeling
- Jayden Le Blanc, Jessica Rogers, Ashlee Beverett, research on ROS and aging
- Daria Clegg (ASPIRE scholar), genomics investigation of health disparity
- Mislie Jean-Bapstie (ASPIRE scholar), bioinformatics investigation of healthy disparity.
- Alannah Mack, Anique Thompson, Kofi Khamit-Kush, Kasha Price (BIO380), survey and research project on metric proficiency, scientific literacy and attitude.

2011~2012 (15 undergraduates, including 1 honors thesis)

- Lindsay Parnell, oxidative stress and genome integrity. **Honors thesis**.
- Morgan Maite, independent study. Wild isolates of yeast and microbes.
- Yamisha Rutherford, independent study. Lifespan extension effect of pcp1 null mutation.
- Brittni Wilson, independent study. TOR pathway in cellular aging
- Megan Magee, independent study. Quantitative analysis of yeast aging process.
- Janella Wynter, summer research and independent study. Survey yeast life spans and ridicicol effect on aging.
- Shyla Hardwick, summer research. Survey yeast life spans.
- Andrea Brown, Math major, independent study. Reliability model of cellular aging.
- Hilary Cooks, ASPIRE. Bioinformatics project using Python.
- Kinnari Matheson, Orrianne Morrison, Robin Levy, Jessica Christopher, Jessika Williams, Lisa Jones (BIO320).

2010~2011 (13 undergraduates)

- Alice Story, BIO320. Interconnection of molecular evolution, gene network, and cellular aging.

- Erika Dommond (math major), HHMI scholar. Network model of cellular aging.
- Dominique Parker, independent study. Oxidative stress and cellular aging.
- Meighan Parker, independent study. Oxidative stress and cellular aging.
- Joi Gaddy, ASPIRE scholar. Comparative genome analysis in Bacillus genomes.
- Alisha Caliman, RISE scholar. Oxidative stress on cellular aging.
- Jasmine Halcome, Devany Brown (CS major), ASPIRE scholars. Bacillus Genome Database.
- Leondra Patrice McGahee (math major), Kiara Brown, Courtney Dill, simulating emergence of infectious diseases.
- Brittni Wilson, HHMI scholar. TOR pathway in cellular aging
- Megan Magee, independent study. Quantitative analysis of yeast aging process.

2009~2010 (6 undergraduates)

- Meighan Parker, HHMI scholar. Oxidative stress and cellular aging.
- Shyla Hardwick, BIO491i. Isolation and characterization of *Mycobacteriophage* sp. *Faith* 1.
- Kenee Daffin, BIO320. Effects of protein electrostatic property on protein interactions in yeast.
- Corin White, BIO320. Using support vector machine to predict longevity genes.
- Charita Montgomery and Whitney Payton, BIO320. Aging and gene networks.
- Lolade Bolaji, volunteer. R and biostatistics.

Career Choices of Selected Research Students

- Corin White, Class of 2010. Ms White received her PhD on evolutionary biology from Kansas State University in 2015.
- Whitney Payton, Class of 2010, currently an Ed D student at the Clark Atlanta University
- Alisha Caliman, Class of 2011, currently a PhD student studying molecular biology at the University of California at San Diego.
- Kinnari Matheson, Class of 2012, currently a PhD student studying genomics at Princeton University.
- Morgan Maite, Class of 2012, currently a PhD student studying microbiology at the Louisiana State University.
- Robin Levy, Class of 2012, currently a PhD student studying molecular biology and bioinformatics at the University of South Florida
- Lindsay Parnell, Class of 2012, currently a PhD student at Washington University at St Louis.
- Courtney Dill, Class of 2012, currently a PhD student at Morehouse Medical School.
- Yamisha Rutherford, Class of 2012. currently a Ph.D student of epidemiology at Georgia State University.
- Jessica Coats, Class of 2013, currently a PhD student studying mathematical and theoretical biology at Emory University.
- Amanda Alexander, Class of 2014, currently to Biomedical Engineering PhD program at Yale University.
- DeAndra Jones, Class of 2015, currently in the Tufts School of Dental Medicine.
- Daria Clegg, Class of 2014, currently in the East Carolina School of Dental Medicine.

Student Scholarship/Fellowship Applications Sponsored

These are some of the students that I helped with their research proposals or applications.

- DeAndra Jones, Emering Researchers National Conferences in STEM, Spring 2015. Travel award.
- Keyana Scott and Zhane Cruickshank, FASEB MARC travel award to attend the annual Yeast Genetics Meeting at Seattle, WA. May 16, 2014. ~$1.8K per student, awarded.
- Keyana Scott, Spelman ASPIRE summer program, summer 2014. $5K, awarded.

- Brittany Jackson, Spelman ASPIRE summer program, summer 2014. $5K, declined.
- Alice Story, a travel award to attend the annual meeting of the Society for Molecular Biology and Evolution (SMBE) at, Kyoto, Japan. $~2.5K, awarded.
  Miss Story was 1 of 10 winners in a worldwide competition.
- Daria Clegg and Mislie Jean-Baptiste, Spelman ASPIRE student research scholarship, 2012-13, ~$3K per student, awarded.
- Brittani Wilson, summer REU application, Fred Hutchinson Cancer Research Center, 2011, ~$5K, awarded.
- Janella Wynter and Shyla Hardwick, summer REU application, Princeton University, 2011, ~$5K per student, awarded.
- Lindsay Parnell, Collaborative Research Experience for Undergraduates, 2011, ~$10K, declined.
- Meighan Parker, summer REU application, Fred Hutchinson Cancer Research Center, 2010, ~$5K, awarded.
- Meighan Parker, Poster on the Hill, Council on Undergraduate Research, $~2K, declined.
- Kiara Brown, Leondra Patrice McGahee, and Courtney Dill, Collaborative Research Experience for Undergraduates, 2010-2011, ~$23K, awarded.

UTC Research Day Presentations

Spring 2017. Three posters by Stephne Clark, Kathryn Rouse, and Emine Guven. Two talks by Hong Qin and Emine Guven.

Spelman Research Day Presentations (2010-2016)

2010	2 talks	Corin White (*second place winner*), Kenee Daffin
	3 Posters	Shamera Robinson, Kyla Greenfield, Charita Montgomery (second place winner), Meighan Parker
2011	3 talks	Alisha Caliman, Alice Story, Meighan Parker
	8 Posters	Meighan Parker, Dominique Parker, Kiara Brown, Brittni Wilson, Erika Dommond (*second place winner*), Megan Magee, Joi Gaddy, Courtney Dill, Janella Wynter, Leondra McGahee (*second place winner*).
2012	3 talks	Lindsay Parnell, Janella Wynter, Robin Levy
	5 Posters	Yamisha Rutherford (*first place winner*), Lindsay Parnell, Janella Wynter, Jessica Christopher, Morgan Maite
2013	3 talks	Amanda Alexander, Palpasa Manandhar, Alannah Mack
	4 posters	Ashlee Beverett, Daria Clegg, Mislie Jean-Bapstie, Anique Thompson, Kasha Price, Megan Braynt
2014	2 talks	Anique Thompson, Brittany Jackson
	5 posters	Ashlee Beverett, Ariel Harden (*second place winner*), Mislie Jean-Baptiste, Deja Heckard, Kaitlyn Jackson, Kayla Lowe, Corinthia Wilkerson, Marie Djedjro, Chezlyn Patton
2015	4 posters	DeAndra Jones (*second place winner*), Keyana Scott, Taylor Williams-Hamilton and Akeela Lewis (*first place winner*), Jasmin Eatman and KayCei Moton-Melancon.
2016	2 talks	Imani White, Kierra Parker (*second place winner)*
	6 posters	Maya Jones, Faith Lyons, Jessica Corley, Maya Bryant, Elsie Manchuria, Unique Hayes, Jaliyah Peterson, Lady Nwadike

SERVICE

Service at UTC (since Fall 2016)

- Served on University Budget and Economic Status Committee, Fall 2017 ~ present.
- Served on the Search committee for the Associate Professor position of Chemical Engineering, Fall 2017.
- Served on the Search committee for the Assistant Professor position of Population Genetics, Fall 2017.
- Participated in the planning effort for the Federal Team Campus visit, Fall 2017.
- Served on the search committee for SIMCenter Director. Fall 2016 – Spring 2017.

College-level Service at Spelman College (Fall 2009-Spring 2016)

- Serve on the College strategic planning steering committee. Worked closely with the Parthenon/Ernest & Young consultant team. Spring 2016.

- Organized a meeting between Spelman faculty and Clark Atlanta University faculty to discuss collaboration on quantitative biology and biophysics. August 27, 2015.

- Organizer of a conference call meeting on computational and systems biology at HBCUs, November 20, 2014.
  Participants of the conference call included three NSF program officers, 7 Spelman faculty and 1 administrator, 1 Morehouse faculty, 1 faculty from Clark Atlanta University, 1 faculty from Georgia State University, 1 faculty from Emory University, 4 faculty from Georgia Tech.

- Local organizer of an internationally renowned programming workshop, June 2014
  Software Carpentry Bootcamp is a programming workshop with international reputation. In summer 2014, bootcamps are held at Stanford University, Vanderbilt University, UC Davis, Duke University, Rockefeller University, University of Melbourne at Australia, and University of Reading at UK. Spelman College is the only HBCU that has hosted its bootcamp. Participants of the Spelman bootcamp also come from Emory University, Georgia State University, and Morehouse Medical School.

- Educational Technology Committee, May 2014 – present.
  I have a habit of documenting technique procedures. For example, I wrote detailed step-by-step guide to use LotusNotes and Moodle and posted them on my own blog. Some faculty have found these procedures helpful. By serving on the College Educational Technology Committee, I wish to use my expertise to help more faculty with educational technological issues.

- Faculty Welfare Committee, August 2012 – present.
  I participated in regular meetings and communications with regards to issues related to faculty, such as logistics, meeting scheduling practices, salaries and compensations.
  In Spring 2015, I played a significant role in drafting the parental leave policy.

- Community Standard Review Board, 2010 – 2014.
  I participated in the deliberation of 4 cases in 2010-2011, 5 cases in 2011-2012, 4 cases in 2012-2013, and 2 cases in 2013-2014.

- Faculty sponsor for student chapter of the Society of Industrial and Applied Mathematics (SIAM)

I worked with Dr. Monica Stephens and Jakita Thomas, submitted an application for SIAM student chapter at Spelman in fall of 2012. This SIAM chapter was approved in the spring of 2013.

- Chair of the HHMI search committee for interdisciplinary faculty position, 2012-2013
  I coordinated the search activities with one dean, departmental chairs, and one senior faculty. I organized the candidate application materials, chaired the evaluation meetings, and wrote summary report to the Provost.

- Faculty workshop, co-organized with Richard Lu, 'Using Wiki, GoogleDocs, Dropbox, and YouTube in Classrooms and Student Projects", August 10, 2012.
  I led a hands-on workshop for ~40 faculty for Spelman Faculty Institute.

- Organizer and host of a recruitment visit from the Michigan State University, March 29, 2012
  I hosted Dr. Barry Williams and Dr. Judi Brown Clarke from the Michigan State University for their recruitment visit to Spelman College. I schedule the recruitment activities with the RISE and HHMI programs.

- Volunteer on the Spelman Research Day, spring, 2010.
  I led an oral presentation session on Research Day in 2010.

- Student research recruitment.
  I participated in the interviews of student applicants for the Spelman Research Initiative for Scientific Enhancement (RISE) program in Fall 2010, 2011.

- Spelman Faculty Research Day, October 29, 2010.
  I gave an oral presentation on Spelman Faculty Research Day in 2010. Title: "A network model of cellular aging".

- Spelman College retreat panel, May 18, 2011
  I participated in a panel discussion on designing new informatics and programming courses for STEM majors. The panel included faculty from both computer science and biology departments.

- ASPIRE collaborative project, 2010-2013.
  I led a collaborative bioinformatics project with faculty from computer science and environmental sciences. The project is a collaboration with Dr. Alfred Watkins, Dr. Victor Ibeanusi, and Dr. Adam Driks from the Loyola University at Chicago. This project supported the Wiki website at http://sunrays.spelman.edu/bgd, which is used for both student learning and research.

- NSF Major Research Instrument application, fall 2011.
  I led an NSF Major Research Instrument application with faculty participants from Biology, Environmental Sciences, Chemistry, Mathematics, and Computer Sciences. I was the lead writer and PI for this proposal to request an image flow cytometer. I received supports and collaborations from seven faculty members in various departments.

- Spelman HHMI proposal writing, fall 2011.
  I contributed to the Spelman HHMI proposal by writing the section on integrated science education.

- Interdisciplinary course development with Computer Science Department. 2011-2013

I helped propose an introductory programming course to all STEM majors. In collaboration with faculty from the computer science department, we proposed a programming course that can offer much needed computing training to all STEM majors.

- Student research mentoring outside of the department, 2009-present
  I mentored one mathematics student in the 2009-2010 semester, two students from computer science department and three students from mathematics department in the 2010-2011 semester, and one mathematics student in the 2011-2012 semester, two mathematics students in 2012-2013 semester.

Departmental Service at Spelman College (Fall 2009-Spring 2016)

- Departmental training events.
  I organized an UCSC genome browser tutorial for the biology departmental retreat. May 2015.

- Member of biology faculty search committee, 2009-10 and 2010-11.
  I reviewed and ranked several dozens of applications for biology faculty positions, and participated in on-site interviews each year.

- HHMI educational technology specialist recruitment, 2010
  I screened ~20 candidates. The HHMI program eventually hired one of my top 3 candidates.

- Equipment demonstrations
  I organized two flow cytometer demonstrations from vendors in the spring of 2011.

- Guest course lectures
  I gave lectures or computer labs in other faculty's classes when my expertise on certain topics was helpful to their students. I have given several guest lectures at BIO110 and BIO471.

- Biology 110 field trips.
  I volunteered to assist with the biology field trips to the Davidson-Arabia mountain in 2009 and 2011.

- Student sponsorship
  - I brought 1 student to Fred Hutchinson Cancer Research Center at Seattle to participate in the summer research program in 2010,
  - I brought 2 Spelman students to Princeton University to participate in the summer research program in 2011,
  - I brought 3 Spelman students to attend the Undergraduate Research Conference at NIMBioS, Knoxville, TN, November 16-17, 2013.
  - I brought 1 Spelman student to attend the 2014 meeting of the Georgia Academy of Science at Georgia Regents University, Augusta, GA.
  - I brought 2 Spelman students to attend the 2014 Yeast Genetics Meeting at Seattle in August 2014.
  - I brought 3 Spelman students to attend the Undergraduate Research Conference at NIMBioS, Knoxville, TN, November 1-2, 2014.
  - I brought 6 Spelman students to attend the Undergraduate Research Conference at NIMBioS, Knoxville, TN, November 21-22, 2015.

- Student research liaison

I visited the BEACON center at Michigan State University to discuss plans for sending Spelman students to REU programs and graduate schools at MSU. October 2011. My visit established a connection between Spelman and MSU BEACON. In June 2014, MSU BEACON supported a Software Carpentry Bootcamp at Spelman College.

Graduate Student Mentoring

- PhD thesis committee. Rebecca Howie, Georgia Institute of Technology, 2015 ~ present
- PhD thesis committee, Maxine Harlemon, Clark Atlanta University, 2015 ~ present
- MS student thesis, Yi Jiang, University of Tennessee Chattanooga (as external advisor), 2014-2015.

Student Advising and Engagement at Spelman College (Fall 2009-Spring 2016)

- Biology major advising: 3 students in 2010-2011, 15 students in 2011-2012, 15 students in 2012-13, 18 in 2013-2014, and 12 in 2014-2015. (These do not include FYE advising).

- First Year Experience advising, 15 students in 2011-12, 17 students in 2012-13, 20 students in 2014, 38 students in Fall 2015.

- Faculty sponsor and advisor for student chapter of the Society of Industrial and Applied Mathematics.
  In 2012, I wrote the first draft for the letter of intent with the list of activities, and recruited faculty and student participants for the Spelman SIAM Chapter.
  I have been actively involved in this SIAM student chapter since its establishment.

Professional Service

- I am a co-organizer and the webmaster for the NSF funded workshop series, Finding Your Inner Modeler. See https://compmodelmatch.github.io/main/.

- I am Faculty Mentoring Fellow at the Quantitative Undergraduate Biology Education and Synthesis (QUBES). I organized a 7-member online working group to develop video tutorials for genomics education in Fall 2017. See https://qubeshub.org/groups/genomicsvideos.

- Poster judging at conferences
  Judge at the RISE summer research symposium, Spelman College, July 11, 2014
  Judge at the annual meeting of Georgia Academy of Science, March 28-29, 2014.
  Judge at the Atlanta Area Molecular and Cellular Biophysics Symposium, Dec 7, 2013.

- Live-tweeting professional meetings
  I have live-tweeted various professional meetings, such as the 2012 annual meeting of society of mathematical biology, the 2012 annual meeting for the yeast molecular biology and genetics, the 2012 Spelman Faculty Institute, 2013 Q-bio.

- Textbook review, Wiley Publisher. Spring, 2010.
  I reviewed the draft version of “Integrated Systems Biology” written by A. Malcom Campbell.

- Consultant, the phage galaxy consortium. 2010-12.
  I share my expertise in microbial genomics with colleagues in the phage consortium led by Dr. Louise Temple at the James Madison University.

- Consultant, Alabama State University, HBCU-UP program. 2009.
  I share my views and expertise on computational biology with ASU colleagues.

- Mentoring outside of Spelman College
  I mentored a research undergraduate student, Zeta Mui during the summer 2010 at the Fred Hutchison Cancer Research Center, Seattle. I also helped two other students revise their personal statements and applications.
  Graduate student mentoring at SMB 2012 meeting.
  Postdoc career discussion, Yeast 2012 at Princeton.

Outreach & Community Service

- Participation in the Erlanger Hospital shadowing program, Fall 2017 ~ present.

- Chattanooga Chamber of Commerce Spirit of Innovation Fair and Luncheon, October 20, 2017 (scheduled). I was one of the UTC participants of this event.

- Women in Computing, summer 2014
  On June 11, 2014, I invited an African-American female professional programmer, Ms. Rosario Robinson, a manager at the Anita Borg Institute to participate in the Spelman Software Carpentry bootcamp. Ms. Robinson graciously worked as a TA for the bootcamp and shared her experience of working in the technology field with Spelman students. Ms. Robinson is also a member of women Python programmer community, called PyLadies that holds regular monthly programming meetings at Atlanta. I will continue to collaborate with Ms. Robinson in order to cultivate Spelman students' interests in computing.

- Cedar Grove High School, spring 2011-2012
  I worked with Ms. Jaqueline Story and Mr. Robert Hairston to develop lab exercises for STEM program at the Cedar Grove High School. I visited Ms. Story's classes and invited her to visit my lab. I have also developed a simple genetic lab exercise to compare mutation rates in haploid and diploid cells for their biology courses.
  I led a genetic lab for 20 Cedar Grove students on November 10, 2011. Two Spelman students volunteered to go to Cedar Grove High School to help this lab and served as role models for the high school students.

- Salem Middle School, April 4, 2011
  My lab hosted five students from Salem Middle School, and gave a short yeast experimental lab exercise on April 4, 2011.

- College career panel, September 22, 2011

I participated in a career panel at Georgia State University on Septe

Dr. Claire L. McCullough, PE

Dept. of Computer Science and Engineering
University of Tennessee at Chattanooga
(423)425-4352 (Work)
Claire-McCullough@utc.edu

PERSONAL:

Citizenship--USA
Highest Security Clearance Held—TS/SCI (inactive)
Registered Professional Engineer—Alabama, License No. 19356

EDUCATION:

B.E. (E.E.), Vanderbilt University, 1980, summa cum laude
M.S.E.E., Georgia Institute of Technology, 1981
Ph.D. (E.E.), University of Tennessee, 1988
Ph.D. Thesis: "Error Considerations in Distributed Estimation"

EXPERIENCE:

Professor of Electrical and Computer Engineering, University of Tennessee in Chattanooga, August 2004 to present. Teach courses in standard areas in addition to pattern recognition and intelligent processing. Conduct research in applications of data fusion, including medical and military applications, publishing papers in these areas as well as accreditation and under-representation issues.

Acting Department Head, Computer Science and Engineering. May 2009-August 2009. Lead in the development and submission of ABET self-study reports for two currently accredited programs, and one program seeking new accreditation in fall, 2009. Interfaced with both faculty and administration regarding ABET accreditation and other issues. Handled budget and personnel issues, hiring one new faculty member during this period.

Associate Professor of Electrical Engineering, University of Tennessee in Chattanooga, August 1999 to 2004. Taught courses in such areas as Communications, Controls, and Signal Processing. Conducted research in areas including data fusion and intelligent control, and published papers in these areas. Mentored students and provided guidance in both technical and career matters. Provided leadership in the development of web pages, curriculum, and ABET assessment for the Electrical Engineering program. Principal investigator of "Adventures in Computers, Engineering, and Space," a program funded by the National Science Foundation, to attract women to engineering, computer science, and space sciences through middle school exposure to these fields. Principal Investigator of "Bridges to Engineering Science: Teaching Teachers," a planning grant from the National Science Foundation to develop a program to increase the number of under-

represented students entering engineering by inserting engineering science content into K-12. Provided leading edge research consulting services to industry and to the Department of Defense.

Senior Electronics Engineer GS-14, Sensors Directorate, U.S. Army Space and Strategic Defense Command, March 1995 to August 1999. Managed technology efforts in areas such as advanced radar components; microelectronic packaging for reduction of size, weight, and power; automatic target recognition and sensor data fusion for both airborne platforms and seeker applications, fusing information from conventional radar, infrared and ladar sources; and software development. Former action officer for the Discoverer II satellite groundstation program. Developed web pages for Sensors Directorate and applications. Served as resource person in the area of intelligent processing for the ERINT guidance processing unit IPT.
Conducted research in the areas of data fusion and intelligent control, and published papers in these areas.

Senior Electronics Engineer GS-14, Advanced Technology Directorate, U.S. Army Space and Strategic Defense Command, March 1992 to March 1995. Managed engineering research in emerging technology areas such as neural nets, fuzzy logic, intelligent processing, and electro-optics, with small businesses, universities, and major defense contractors. Participated in all aspects of the contracting process for Small Business Innovative Research projects, from proposal evaluation to progress assessment to final report evaluation. Conducted research in the area intelligent control, and published papers in this area.

Assistant Professor of Electrical and Computer Engineering, University of Alabama in Huntsville, September 1988 to March 1992. Taught courses in electrical engineering, controls, and robotics. With a graduate student, designed, built, and tested a small mobile robot. For NASA, designed, simulated, and evaluated neural network and fuzzy logic controllers for a flexible beam. Developed and simulated a new method of adaptive neural net control for nonlinear systems, and a new type of anticipatory neuro-fuzzy control. Wrote and presented technical papers on these, and other aspects of controls and reliability. Designed and ran a program (funded by the National Science Foundation) to attract women and minorities to careers in engineering.

Instructor of Electrical and Computer Engineering, University of Tennessee, September 1983 to August 1988. Taught undergraduate courses in all aspects of electrical engineering, including controls, communications, and digital logic design. Designed laboratory experiments for these courses. Conducted research evaluating error considerations and stability of nonlinear stochastic systems, and wrote technical papers on these topics.

Electrical Engineer at the Tennessee Valley Authority, November 1981 to August 1983. Performed portions of probabilistic risk assessments and reliability studies for TVA nuclear
plants including Browns Ferry, Sequoyah, and Bellafonte, using fault trees and dedicated

computer codes such as GO. Using GO, modeled and evaluated the reliability of the entire

Browns Ferry electrical system.

Member of Technical Staff at AT& T, June 1980 to August 1981 (partly while attending Georgia Tech). Investigated the effects of sun transit time on communication satellites.

AREAS OF INTEREST:

Sensor Data Fusion
Automatic Target Recognition
Control Using Neural Nets and Fuzzy Logic
Application of Control Theory to Robotic Systems
Probabilistic Risk Assessments and Reliability Studies
Distributed Estimation
Engineering Ethics
Under-representation in STEM fields

EXTERNAL FUNDING AT UTC:

Adaptive Methods Contract for $31,786 awarded June 23, 2008 for sensor fusion for Navy
Anti-Submarine Warfare. Subsequent funding totalling $87,589 was added to the project since that time.
NSF Grant for $99,806 awarded September 1, 2002 for BESTT planning grant.
NSF Grant for $99,274 awarded January 1, 2001 for ACES program.

RESEARCH AND PROFESSIONAL ACTIVITIES:

Principal Investigator of “Computer-aided Risk Analysis for Acute Coronary Syndromes in Chest Pain Patients, ” funded by the UTC internal Collaborative Research Initative for Sponsored Projects (CRISP) for $9,840, 2012-13.

Ethicist for the 2013-2013 National Science Foundation Research Experiences for Undergraduates program at UTC, 2012-13.

Principal Investigator of “Data Fusion Technology and USW-DSS Fusion Technologv Assessment,” funded by the US Navy Anti-Submarine program through Adaptive Methods, 2008-2009. Goals were development of metrics and independent assessment of fusion processes and technologies for the Undersea Warfare Decision Support System. Initial funding of $31,786 was awarded June 12, 2008, followed by a second funding increment of $19,489. Additional funding for fiscal year 2009 was $68,100.

Principal Investigator of "Bridges to Engineering Science: Teaching Teachers," a National Science Foundation funded planning grant to "widen the pipeline" from K-12 to engineering, with special emphasis on under-represented groups, 2002 - 2003. NSF

Grant for $99,806 awarded September 1, 2002.

Directed "Adventures in Computers, Engineering, and Space," a National Science Foundation program to provide under-represented middle school students with hands-on experience in engineering, computer science, and space sciences, 2001-2002. NSF Grant for $99,274 awarded January 1, 2001.

Conducted research on fusion of information using a biologically inspired fusion model, as a consultant to Accurate Automation Corporation, funded by U.S. Navy Space and Naval Warfare Systems Command (SPAWAR), 2001-2003.

Technology in Teaching and Learning Faculty Fellow, UTC, 2000-2001.

NASA Research Contract--control of a flexible beam using neural networks and fuzzy logic, 1992.

NASA Summer Faculty Fellow--control of a flexible beam using anticipatory fuzzy logic, 1991.

Directed a National Science Foundation program to provide gifted high school students with hands-on experience in electrical, chemical, and civil engineering, 1990 to 1992.

NASA Summer Faculty Fellow--simulation of control systems using neural nets, 1990.

Johnson Research Center--worked to develop an intelligent, voice-controlled wheelchair capable of path planning and obstacle avoidance, 1989 to 1991.

Aero-Optic Center for Excellence--researched multiple-target tracking as related to in-flight missiles, 1989.

UAH research grant--worked on error bounds in distributed estimation and supervised a graduate student in computer simulation, 1989 to 1990.

SERVICE:

Have served as reviewer for
* *International Journal of Multisensor Information Fusion*
* American Society for Engineering Education Southeastern Section Conference
* SPIE Aerosense Conference
* *AIAA Journal of Guidance, Control and Dynamics*
* *IEEE Transactions on Automatic Control*
* American Control Conference
* Conference on Decision and Control
* National Science Foundation Gender Equity and GK12 Programs
* *Reliability Engineering and System Safety*

ABET Engineering Accreditation Commissioner, 2013- present
ABET EAC PEV for Electrical and Computer Engineering programs since 1996
IEEE Committee on Global Accreditation Activities (CGAA), 2016-present
IEEE Committee on Engineering Accreditation Activities (CEAA) 2011-12
Chair of IEEE CEAA Accreditation Criteria Committee, 2012
Boardmember for ASEE Ethics Society, 2015-17
Boardmember for ASEE Women in Engineering Division 2013-15 and 2016-present

Served on General Education, Honor Court, Student Evaluation of Faculty Committee, UTC Academic Strategic Planning Committee, Undergraduate Curriculum Committee, Engineering Graduate Committee, Handbook Committee, Program Task Force of the College of Engineering Strategic Plan Implementation, Provost Search Committee, Engineering and UTC Petitions Committees, and the Faculty Senate Committee on Committees. Chair of the UTC Grade Appeals Committee, 2010-2011.
American Society for Engineering Education Southeastern Section, Electrical Engineering Division Chair, 2001-2002.
American Society for Engineering Education Southeastern Section, Vice Chair for Research, 2002-2003.
American Society for Engineering Education Southeastern Section, Chair for Research, 2003-2004.
American Society for Engineering Education Southeastern Section, Chair for Awards, 2007-2008.
American Society for Engineering Education Southeastern Section, Secretary of the Computer Engineering Division, 2008-2009.
American Society for Engineering Education Southeastern Section, President-Elect, 2009-2010.
American Society for Engineering Education Southeastern Section, President, 2009-2011.
American Society for Engineering Education Southeastern Section, Vice Chair for Professional Skills Division, 2005-2016.
Treasurer for the Chattanooga Chapter, Society of Women Engineers, 2015-16.
Treasurer for the UTC Chapter of Sigma Xi, 2002-present.
Member of UTC Faculty Senate, 2000-2002; 2003-2004; 2005-2009; 2011-2015.
Second Vice Present of the UTC Faculty Senate, 2014-15.
Chair of the UTC Faculty Handbook Committee, 2014-15.
Faculty advisor for the UTC student IEEE chapter, 2000-2007.
Project Lead The Way university affiliate professor, 2006-present.
Served on Federal Women's Program committee at USASSDC, 1994-1999.
Finance Chair for 1998 IEEE Conference on Decision and Control.
Treasurer of the Huntsville branch of the IEEE, 1991- 1992.
President of the Huntsville branch of the Society of Reliability Engineers, 1991-1992.
Secretary of the Huntsville branch of the IEEE Controls Society, 1989-1992.
Chairman of the Huntsville branch of the IEEE Aerospace and Electronics Society, 1990-91.
Served on UAH Robotics Committee and Calendar Transition Committee, ECE Dept. Graduate Committee, Communications Committee, Undergraduate Committee, and Chairman Search Committee.

HONORS:

Computer Science Department Best Teaching Award, 2016
ASEE Southeastern Section Outstanding Conference Paper, 2012
UTC College of Engineering and Computer Science Research Award, 2002
Grants and Research Award, 2003
Tau Beta Pi
Eta Kappa Nu
Sigma Xi
NASA Technology Transfer Award

RESEARCH REPORTS:

"Data Fusion Technology and USW-DSS Fusion Technologv Assessment," in addition to monthly progress reports, two major reports were submitted in February, 2008:

- *CDRL A003 - Metrics Assessment Report*
- *CDRL A004 – Literature Survey*

Space and Naval Warfare Systems Command (SPAWAR) ***BIOLOGICALLY INSPIRED PROCESSOR FOR ALL-SOURCE DATA ASSOCIATION AND FUSION (BIONIS)*** Contract N00039-01-C-2206 – Bi-Monthly Progress & Status Reports:

- "Possible Prediction of Target from Preceeding Clutter," June 2003
- "SURTASS Classification Results," April 2003
- "Intelligent Processing of SURTASS Feature Data," February 2003
- "Proposed BIONIS LFA Sea Trial," December 2002.
- "Application of BIONIS to LFA Field Test Data," October 2002.
- "Acquisition and Evaluation of LFA Field Test Data," August 2002.
- "Feature Evaluation Tools," July 2002.
- "Evaluation of SPAWAR Lab-Created Data," April 2002.
- "Enhanced BIONIS to Emphasize Sensor Agreement," February 2002.
- "Acquisition and Decoding of Lab-Created Feature and Snippet Data," December 2001.
- "Completion of BIONIS Software Implementation," October 2001.
- "On-Going Development of BIONIS Software Implementation," September 2001.
-

The final report for this project was completed in July 2003, and a patent application covering the work was submitted.

"Bridges to Engineering Science: Teaching Teachers," National Science Foundation Annual Report, August, 2003.

"Adventures in Engineering, Computers, and Space" National Science Foundation Final Report, June, 2003.

"Adventures in Engineering, Computers, and Space" National Science Foundation annual Report, December, 2002.

"Adventures in Engineering, Computers, and Space" National Science Foundation Annual Report, December, 2001.

NASA Contract Final Report, "Flexible Body Control Using Neural Networks," March 1992.

NASA Summer Faculty Fellowship final report, "Control of a Flexible Beam Using Fuzzy Logic," August 1991.

UAH Research Report, Johnson Research Center, "Charger II: An Autonomous Robotic Vehicle," June 1991.

NASA Summer Faculty Fellowship final report, "Neural Networks as a Control Methodology," August 1990.

UAH research grant final report, "Validity of Stochastic Distributed Estimation as an Estimation Tool." June 1990.

UAH Research Report No. 90-23, Johnson Research Center, "Charger II Phase 2 Development," June 1990.

UAH Research Report No. 834, Johnson Research Center, "Charger II Phase 1 Development," December 1989.

PAPERS AND PRESENTATIONS:

C. L. McCullough, S. Chesser, and B. Weathington, “Subtle and Not-So-Subtle Messages of Non-Inclusion,” presented at the American Society for Engineering Education Zone II Conference, San Juan, Puerto Rico, March 2017.

C. L. McCullough, “An Evaluator’s Perspective on Proposed Changes to ABET Criteria,” presented at the American Society for Engineering Education Southeastern Section Conference, Tuscaloosa, AL, March 2016.

C. L. McCullough, “Problem Based Learning as a Tool in Addressing Gender Bias,” presented at the American Society for Engineering Education Conference, Seattle, WA, June 2015.

C. L. McCullough, “How Does Presence of Women in Computer Fields Affect Perception of the Gender Gap?” presented at the American Society for Engineering Education Southeastern Section Conference, Gainesville, FL, April 2015.

C. L. McCullough, “Implicit Association Test as an Indicator of Gender Bias in Computer Fields,” presented at the American Society for Engineering Education Southeastern Section Conference, Macon, GA, March 2014.

C. L. McCullough and Yu Cao, “Ethics and Biomedical Informatics: a Research Experiences for Undergraduates Program at the University of Tennessee at Chattanooga,” presented at the American Society for Engineering Education Southeastern Section Conference, Cookeville, Tennessee, March 2013.

C. L. McCullough, “Ethics for the Information Age,” presented at the American Society for Engineering Education Southeastern Section Conference, Starkville, Mississippi, April 2012.
Awarded Best Paper.

C. L. McCullough, "What Makes a College Graduate "Educated"? A Proposed Curriculum Revision Across Disciplines," presented at the American Society for Engineering Education Southeastern Section Conference, Charleston, South Carolina, April, 2011.

C. L. McCullough, "A Comedy of Errors: Teaching Oral Presentation Skills Using a Spectacularly Bad Presentation," presented at the American Society for Engineering Education Southeastern Section Conference, Blacksburg, Virginia, April, 2010.

R. Canavan, C. L. McCullough and W. Farrell III, “Track-Centric Metrics for Track Fusion Systems,” presented at the 12th International Conference on Information Fusion, Seattle Washington, July 2009.

W. Farrell III, C. L. McCullough and R. Canavan, “Automated Metrics Assessment System for Track Fusion,” presented at the presented at the SPIE Aerosense Conference, Orlando, FL, April 2009.

K. Winters and C. L. McCullough, “A Student-Designed Computer System to Aid ABET Assessment: Using One ABET Requirement to Fulfill Another,” presented at the American Society of Engineering Education Southeastern Regional conference, Atlanta, GA, April 2009.

C. L. McCullough and P. Hoadley, “Information Literacy of Freshmen and Seniors at UTC and VMI,” oral presentation, presented at the American Society of Engineering Education Southeastern Regional conference, Memphis, TN, April 2008.

C. L. McCullough, A. J. Novobilski , F. M. Fesmire, "Use of Neural Networks to Predict Adverse Outcomes from Acute Coronary Syndrome for Male and Female Patients," presented at the 2007 International Conference on Machine Learning and Applications, Cincinnati, Ohio, December 2007.

C. L. McCullough, " ABET EC 2000: How Has It Changed? Has It Accomplished What Was Intended " presented at the American Society for Engineering Education

Southeastern Section Conference, Louisville, KY, April, 2007.

C. L. McCullough, A. J. Novobilski , F. M. Fesmire, "Prediction of adverse outcomes of Acute Coronary Syndrome using intelligent fusion of triage information with HUMINT," presented at the presented at the SPIE Aerosense Conference, Orlando, FL, April 2006.

C. L. McCullough, " Information Literacy: A Critical Component in Engineering Practice in the Twenty-First Century, " presented at the American Society for Engineering Education Southeastern Section Conference, Tuscaloosa, Alabama, April, 2006.

C. L. McCullough, "ABET Assessment: Is It Really as Difficult as It Seems?" presented at the American Society for Engineering Education Southeastern Section Conference, Chattanooga, TN, April, 2005.

C. L. McCullough, "Separating the Wheat from the Chaff in the Information Age," presented at the American Society for Engineering Education Southeastern Section Conference, Auburn, AL, April 2004.

C. L. McCullough, J. Bryson, R. Pap, J. Wilson, and J. Davis, "Biologically Inspired Classification and Target Prediction Using Low Frequency Active Sonar Sensor Features," presented at the Military Sensing Symposia National Symposium on Sensor and Data Fusion, San Diego, CA, June 2003.

C. L. McCullough, "If We Build It, Will They Come?: Attracting, and Retaining, Under-Represented Groups in Engineering," presented at 2003 American Society for Engineering Education Annual Conference & Exposition, Nashville, TN, June 2003.

C. L. McCullough, "Engineering the World: An Assignment to Measure the Elusive ABET f, h, and j," presented at the American Society of Engineering Education Southeastern Section Conference, Macon, GA, April 2003.

C. L. McCullough, J. Bryson, R. Pap, J. Wilson, and J. Davis, "Biologically Inspired Classification of Low Frequency Active Sonar Sensor Features for the Surveillance Towed Array Sonar System," presented at the Joint Undersea Warfare Technology Conference, Naval Postgraduate School, Monterey, CA, March 2003.

C. M. Wigal, N. Alp, C. L. McCullough, S. Smullen, and K. Winters, "ACES: Introducing Girls to, and Building Interest in, Engineering and Computer Science Careers," presented at the 32nd ASEE/IEEE Frontiers in Education Conference, Boston, MA, November 2002.

Organizer and moderator for a panel discussion on "Attracting and Retaining Under-Represented Groups to Engineering and Computer Science," American Society of Engineering Education Southeastern Section Conference, Gainesville, FL, April, 2002. (Invited)

C. L. McCullough, "Attracting Under-Represented Groups to Engineering and Computer

Science," presented at the American Society of Engineering Education Southeastern Section Conference, Gainesville, FL, April 2002.

C. L. McCullough, Robert Pap, Richard Akita, and Jerry Wilson, "Biologically Inspired Fusion of Sonar Sensor Data," presented at the Military Sensing Symposia National Symposium on Sensor and Data Fusion, San Diego, CA, June 2001.

C. L. McCullough, Cecelia Wigal, Neslihan Alp, Kathy Winters, Tom Patty, and Julie Sanders, "ACES: Adventures in Computers, Engineering, and Space," presented at the American Society of Engineering Education Southeastern Section Conference, Charleston, S.C., April 2001.

C. L. McCullough, "Uses of Technology in Attracting and Retaining Under-Represented Groups," oral presentation at the Southeastern Regional Faculty and Instructional Development Consortium Annual Sharing Conference, Chattanooga, TN, March 2001.

M. E. Ulug and C. L. McCullough, "A Quantitative Metric For Comparison Of Night Vision Fusion Algorithms," presented at the SPIE Aerosense Conference, Orlando, FL, April 2000.

C. L. McCullough, "Data Level Fusion of Images from Disparate Sensors," presented at the Eurofusion Conference, Stratford-upon-Avon, U.K., October 1999.

M. E. Ulug and C. L. McCullough, "Feature and Data Level Fusion of Infrared and Visual Images," presented at the SPIE Aerosense Conference, Orlando, FL, April 1999.

B. V. Dasarathy and C. L. McCullough, "Intelligent Multi-Classifier Fusion for Decision Making in Ballistic Missile Defense Applications," presented at the 1998 IEEE Conference on Decision and Control, Tampa, FL, December 1998. (Invited)

M. E. Ulug and C. L. McCullough, "Fusion of Thermal and Vision Images," presented at the 1998 Conference on Artificial Neural Networks in Engineering (ANNIE98), St. Louis, MO, November 1998. Also appeared in *Intelligent Engineering Systems Through Artificial Neural Networks*, Vol. 8, ASME Press, New York, 1998. (Invited)

C. L. McCullough, "Efficacy of Intelligent Processing in Target Identification: a Case Study," presented at the Second International Conference on Non-Linear Problems in Aviation and Aerospace, Daytona Beach, FL, April 1998. (Invited)

Z. J. Geng and C. L. McCullough, "Missile Control Using Fuzzy CMAC Neural Networks," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 20, No. 3, May-June 1997.

C. L. McCullough, Kathy Byrd, Charles Bjork, and Belur Dasarathy, "Multi-Sensor Fusion for Ballistic Missile Defense Applications," presented at the SPIE Aerosense

Conference, Orlando, FL, April 1997.

C. L. McCullough, Kathy Byrd, Charles Bjork, and Belur Dasarathy, "Fused Sensor Discrimination for Ballistic Missile Defense Applications," presented at the US/UK Data Fusion Workshop, London, U.K., March 1997. (Invited)

C. L. McCullough, Kathy Byrd, Hajin Kim, and Charles Bjork, "Interceptor Discrimination Fusion," presented at the AIAA Missile Sciences Conference, Monterey, CA, November 1996.

C. L. McCullough, B. V. Dasarathy, and P.C. Lindberg, "Multi-Level Sensor Fusion for Improved Target Discrimination," presented at the IEEE Conference on Decision and Control, Kobe, Japan, December 1996.

C. L. McCullough, "Laissez-Faire Anticipatory Fuzzy Control," presented at the IEEE Conference on Decision and Control, Kobe, Japan, December 1996.

P. C. Lindberg, B. V. Dasarathy, and C. L. McCullough, "Multi-Level Fusion Exploitation," presented at the SPIE Aerosense Conference on Sensor Fusion, Orlando, FL, April 1996.

C. L. McCullough, "Universal Sensor Fusion Architecture," oral presentation at the BMDO Data Fusion Workshop, Washington, D.C., October, 1995. (Invited)

Z. J. Geng and C. L. McCullough, "Missile Control Using Fuzzy CMAC Neural Networks," presented at the AIAA Guidance, Navigation, and Control Conference, Baltimore, MD, 1995.

C. L. McCullough, "Real-Time Decision Making Using Intelligent Processing," oral presentation at the AIAA Space Conference, Huntsville, AL, September 1994. (Invited)

C. L. McCullough, "Anticipatory Neuro-Fuzzy Control," (condensed from NASA contract reports), *NASA Tech Briefs*, Vol. 18, No. 6, June 1994.

C. L. McCullough, "Neural Net Control vs. Anticipatory Fuzzy Control for a Flexible Beam: a Comparison," presented at the IEEE World Congress on Computational Intelligence, Orlando, FL, June 1994. (Invited)

C. L. McCullough, R. Reed, and I. Jaszlics, "An Artificial Neural Net Battle Management Aid for Ballistic Missile Defense," presented at the 19th Army Science Conference, Orlando, FL, June 1994.

C. L. McCullough, M. Crull, and D. Thomas, "**Adventures in Engineering**: a Unique Program to Attract Under-represented Groups to Engineering," *IEEE Transactions on Education*, Vol. 37, No. 1, February 1994.

C. L. McCullough, J. D. Birdwell, and S. Lenhart, "Stability of Distributed Estimators for Linear Stochastic Systems," *Optimal Control Applications and Methods*, Vol. 14, No. 3, July-September 1993.

C. L. McCullough, "Intelligent Controllers Which Can Adapt to Changing Environments: Anticipatory Neuro-Fuzzy Control," presented at the American Control Conference, San Francisco, CA, June 1993. (Invited)

C. L. McCullough, "Anticipatory Neuro-Fuzzy Control: a Powerful New Method for Real World Control," presented at the IEEE International Workshop on Neuro-Fuzzy Control, Muroran, Japan, March 1993. (Invited)

Invited Panelist in a discussion of "What is Beyond Single Layer Fuzzy Control?" Second International Workshop on Industrial Fuzzy Control and Intelligent Systems, College Station, TX, December 1992. (Invited)

C. L. McCullough, "Adaptive Control of Noisy Nonlinear Systems Using Neural Networks," presented at SimTec '92 International Simulation Technology Conference, Houston, TX, November 1992.

C. L. McCullough, "A Neural Network Adaptive Controller for a Class of Nonlinear Systems," *Journal of the Franklin Institute*, Vol. 329, No. 5, September 1992.

C. L. McCullough, "Control of a Flexible Beam Using Anticipatory Fuzzy Logic," presented at the American Control Conference, Chicago, IL, June 1992.

C. L. McCullough, "An Anticipatory Fuzzy Logic Controller Utilizing Neural Net Prediction," *Simulation*, Vol. 58, No. 5, May 1992.

C. L. McCullough, "Two Methods of Control Using Neural Net Emulation," presented at WNN-92 International Conference on Neural Networks, Auburn, AL, February 1992.

C. L. McCullough and C. A. McCullough, "A Critical Analysis of Appendix R Modifications at the Browns Ferry Nuclear Plant," *Reliability Engineering and System Safety*, Vol. 33, January 1991.

M. O. Hofmann and C. L. McCullough, "A Knowledge-Based Reliability Analysis System," presented at the IEEE International Conference on Systems, Man, and Cybernetics, Los Angeles, CA., November 1990.

C. L. McCullough and C. A. McCullough, "Preventive Maintenance Based on Reliability Centered Maintenance Analysis as Applied to the Browns Ferry Nuclear Plant," *Power Engineering*, October 1990.

C. L. McCullough, and M. O. Hofmann, "An Expert System for Generation of

Hardware Failure Equations," presented at the American Nuclear Society conference, Nashville, TN., June 1990.

C. L. McCullough and C. A. McCullough, "An Evaluation of the Browns Ferry Nuclear Plant Preventive Maintenance Program Based on Reliability Centered Maintenance Analysis," presented at Power-Gen '89, New Orleans, LA., December 1989.

Mark West and C. L. McCullough, "An Optimal Recursive Filter for the Attitude Determination of the Spacelab Instrument Pointing System," presented at the Conference on Decision and Control, Tampa, FL., December 1989.

C. L. McCullough, "Probability Density Update for a Distributed System Based on Unnormalized Local Densities in the Continuous-Discrete Case," presented at the Conference on Decision and Control, Tampa, FL., December 1989.

C. L. McCullough and C. A. McCullough, "A Data-Based Approach for Failure Cause Analysis as Applied to the Brown Ferry Nuclear Plant Preventive Maintenance Upgrade Program," presented at the Symposium on the Design of Mechanical Systems in a Concurrent Engineering Atmosphere, University of Iowa, October 1989. (Invited)

C. L. McCullough, "Probability Density Update for a Distributed System Based on Unnormalized Local Densities," presented at the Southeastern Symposium on Systems Theory, Tallahassee, FL., March 1989.

C. L. McCullough and J. D. Birdwell, "Error Considerations in Distributed Estimation of Nonlinear Stochastic Systems," presented at IEEE ComCon, Baton Rouge, LA., October 1988.

C. L. McCullough, J. D. Birdwell, and S. M. Lenhart, "Necessary and Sufficient Conditions for Bounded Covariance in Linear Stochastic Systems," presented at the American Control Conference, Atlanta, GA., June 1988.

C. L. McCullough and J. D. Birdwell, "Stability of Estimators for Linear Systems," presented at IEEE Southeastcon, Knoxville, TN., April 1988. (Invited)

C. L. McCullough and J. D. Birdwell, "Sufficient Conditions for Bounded Covariance in Linear Stochastic Systems," presented at the 19th IEEE Southeastern Symposium on System Theory, Clemson, S.C., March 1987.

W. Russell Hare

2303 Pack Road NW
Fort Payne, Alabama 35968
Phone: (423) 505-3602 E-mail: William-Hare@utc.edu | russellhare@bellsouth.net

Qualifications

Computer Professional with 40 years' experience in education, systems engineering, project management, and enterprise architecture. Technical experience/skills include::

- IBM Z / System z10, 3090, 303x, 360/370,MVS OS/XA/ESA, OS/390, z/OS, JES2/JES3, UNIX SVR4, MS-DOS, Windows 95/98/NT/2000/XP/7/10
- COBOL, COBOL II, COBOL/370, COBOL/MVS, COBOL/390, Enterprise COBOL for z/OS, MICROFOCUS COBOL, PL/1, RPG, IBM Assembler, Easytrieve Plus, JCL
- IMS DB/DC, DL/I, CICS, VSAM, DB2, Oracle
- TSO, ISPF, SDSF, Xpediter, Panvalet, IBM Mainframe Utilities, File-Aid, Microsoft Office (Word, Excel, Powerpoint, Access, Project)
- INTEL Assembler, JAVA, J++, C, C++, C#, HTML, DHTML, CSS, XML, CGI Perl, Javascript, SPARC Assembler, Motorola 68000 Assembler

Work History

2017 - Present **University of Tennessee Chattanooga**, *Chattanooga, TN*
Lecturer

- Teach computer science / computer engineering courses
- CPSC 1100, 1110, 4900, 4910, 4220; CPEN 4710

2000 - 2016 **CIGNA Healthcare Corporation**, *Bloomfield, CT*
Consultant | Senior Project Manager | Architecture Manager

- Enterprise Solution Architect / Cigna Global Architecture (CGA)
- TOGAF 8 certified architect

2010 - Present **University of Tennessee at Chattanooga**, *Chattanooga, TN*
Adjunct Instructor

- Teach CPSC 1100; CPEN 4710

1997 - 2000 **Computer Horizons Corporation**, *Chattanooga, TN*
Consultant
CIGNA Healthcare Corporation, *Chattanooga, TN*

- System design and programming COBOL/IMS applications on a MVS OS/390 platform
- Developed a migration methodology and software that allowed CIGNA to install Y2K upgrades directly to the production environment—reducing risk and implementation time

1989 - 1997 **EDS**, *Plano, TX*

Advanced System Engineer | System Engineer Manager
United States Air Force, *Maxwell AFB, Montgomery, AL* **(1991-1997)**

- System Architect for USAF Combat Ammunition System-Base (CAS-B) using MICROFOCUS COBOL on a UNIX System V platform
- Led a team that designed security architecture for CAS-B, the Air Force's first-ever operational multilevel secure (B1) system
- Managed the proposal team for a CSA-B task order and negotiated a $2.4M contract
- Project Manager for the CAS-B upgrade—completing on schedule and under budget

Lamar Life Insurance, *Jackson, MS* **(1990-1991)**

- Maintained and modified CICS/COBOL life insurance applications on a MVS/XA platform

Chubb LifeAmerica Insurance Co., *Concord, NH;* and
Volunteer Life Insurance Co., *Chattanooga, TN* **(1989-1990)**

- Developed applications to bridge existing claim systems to the EDS Insurance Machine using COBOL II on a MVS/ESA platform
- Identified errors in the claims database and created an IMS database in-place repair utility—saving the customer a two-month reload task

1988 - 1989 Wild Hare Systems, *Soddy-Daisy, TN*
President/Chief Engineer

- Founded the company and created a custom software development environment—integrating dBase III, Clipper, and SPF-PC on an INTEL PC
- Designed and developed custom applications for clients

1987 - 1988 Transamerica Occidental Insurance Co., *Los Angeles, CA*
Programmer-Analyst III

- Maintained and modified the GCPS claim system using PL/1 on a MVS/XA platform.
- Installed and bridged the ProClaim claim system to the GCPS system.

1986 - 1986 Lockheed-Georgia Aeronautics, *Marietta, GA*
Consultant

- Converted production systems from COBOL/DMS on a Honeywell platform to COBOL/IMS on an MVS/XA (Amdahl) platform.
- Converted the Parts Order System for the C-130, C-141, and C-5A aircraft

1980 - 1986 Provident Life & Accident Insurance Co., *Chattanooga, TN*
Systems Analyst

- Maintained and modified the PROCLAIM Claim Statistical System (CLS) using COBOL on a MVS/XA platform

Supervisor of Education

- Trained a pool of 5 to 20 entry level programmers in COBOL, IMS, JCL, IBM Utilities, TSO, SPF, and Easytrieve Plus
- Taught continuing education classes to Corporate Systems staff

1978 - 1980 Electronic Computer Programming Institute (ECPI), *Chattanooga, TN*
Director of Education

- Taught data processing courses including: DP Fundamentals, COBOL, RPG II, IBM Assembler, and BASIC.

Education

University of Tennessee Chattanooga
M.S. Computer Science (2008)
B.S. Computer Science/System Architecture (2002)
Alabama State University, Computer Science (attended 1996-97)
Electronic Computer Programming Institute, Data Processing Specialist (graduated 1978)
University of Tennessee, Electrical Engineering (attended 1970)
Georgia Institute of Technology, Electrical Engineering (attended 1969-72)

Appendix G. Undergraduate Syllabi Examples

Computer Architecture

Spring 2018

CPEN 4700-0, CRN 25606, lecture course, 3 credit hours

Instructor: Dr. Joe Dumas

E-mail and Phone Number: Joe-Dumas@utc.edu, (423) 425-4084. On days when classes are in session, you can expect e-mails to be answered within 24 hours. Response time may be longer over weekends and holidays, or if I am traveling out of town (*e.g.* to a conference). If you need immediate assistance and I am not in my office, please contact CSE administrative specialist Ms. Eva Hunter at (423) 425-4349 or Eva-Hunter@utc.edu.

Office Hours and Location: EMCS 313C – office hours will be posted on my office door. If you would like to make an appointment for a specific time, please e-mail me with possible dates/times you could meet.

Course Meeting Days, Times, and Location: 1:40 to 2:55 p.m. Tuesday/Thursday, EMCS 301.

Course Catalog Description: An advanced course in computer architecture. Topics include classical uniprocessor architecture, computer arithmetic, instruction sets, control unit design including the basics of microprogramming, I/O operations, memory hierarchies, cache and virtual memory mechanisms, instruction and arithmetic pipelines, CISC, RISC, superscalar and superpipelined architectures, parallel architectures.

Course Pre/Co Requisites: *CPSC 2800 and CPEN 3700 with grades of C or better. If you have any doubts regarding your preparation to take this course, please discuss your situation with me as soon as possible*.

Course Student Learning Outcomes: This course will amplify and expand upon the fundamentals of computer system organization and architecture covered in CPEN 3700 (and 3710, for students who have taken that class). Students will learn about the history and evolution of computer architectures and will become conversant with many of the terms and concepts used in the field of modern computer system design. Topics of particular interest will include von Neumann and non-von Neumann architectures, performance measures, data representations and instruction sets, control unit design, RISC and CISC machines, parallel processing, pipelining, I/O techniques, cache memory, and memory management systems.

Course Fees: CECS Differential Course Fee applies.

Required Course Materials: Textbook: Dumas, Joseph D. II. *Computer Architecture: Fundamentals and Principles of Computer Design*, Second Edition, CRC/Taylor & Francis, 2017. ISBN 978-1-4987-7271-6.

Supplemental/Optional Course Materials: Supplemental materials, if needed, may be provided via UTC Learn.

Technology Requirements for Course: Students will need a computer with a web browser that is compatible with UTC Learn (Blackboard) in order to access assignments. If you are not sure whether your browser is supported, please visit the following link: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support/Browser_Checker The final project report will require students to use a word processor (*e.g.* Microsoft Word) and produce a PDF file. Students may do this on their own, personal computers or in any of the CSE department labs (EMCS 306, 312, 321) when they are not in use by another class.

Technology Skills Required for Course: Students must be able to navigate the UTC Learn site using a web browser in order to access the final project assignment and other course information. Students also need to be able to use a word processor to create and save files, and must possess basic file manipulation skills in a Windows environment. Students need to be familiar with binary and hexadecimal arithmetic, logic gates, and other basic digital logic circuits introduced in CPEN 3700.

Technology Support: If you have problems with your UTC e-mail account or with UTC Learn, contact the IT Solutions Center at 423-425-4000 or e-mail itsolutions@utc.edu.

Course Assessments and Requirements: Grades will be based on your performance on three in-class tests, a comprehensive final examination, and a final project which may consist of a research paper on an assigned topic and/or an investigation of some topic related to the course material. (The project will also require an oral presentation; specific requirements will be covered in a separate handout.) Your numerical average for the course will be based on the following weighting: Test 1, 20%; Test 2, 20%; Test 3, 20%; Final Exam, 25%; Final Project, 15%.

Course Grading

Course Grading Policy: Letter grades for the course will be assigned on the following scale: 90.00 or higher, A; 80.00 - 89.99, B; 70.00 - 79.99, C; 60.00 – 69.99, D; less than 60.00, F. Note that CPEN 4700 is a core course which must be passed with a grade of C or better in order to graduate with a degree in computer engineering or computer science, or to take any other courses which require it as a prerequisite. Thus, students who earn any grade below C will need to repeat the class.

Instructor Grading and Feedback Response Time: Tests will be graded and returned as soon as possible, usually at the next class meeting, although turnaround time may be up to a week or more at busy times of the semester. The final project reports/presentations will only be graded after all groups have completed their presentations. If you would like a scanned copy of your group's graded project, you may request it via e-mail. When papers are returned to you, review them carefully. If you detect an error in scoring or have any other questions, contact me as soon as possible. **I will not adjust scores any later than one week after the graded item in question has been returned to you.**

Course and Institutional Policies

Late/Missing Work Policy: No make-up exams will be given. The final exam score will be counted in place of the lowest of the three test scores if it helps your grade. If you miss one of the tests for any reason, excused or unexcused, your score for that test will be zero and your final exam score will be used in place of that test. Scores for a second or third missed test will be assigned at the instructor's discretion, with a default value of zero if the absence(s) are unexcused. **You are responsible for submitting the final project assignment on time, both as a PDF file and as a hard copy.** *Late final projects will be penalized severely if they are accepted at all.*

Student Conduct Policy: UTC's Academic Integrity Policy is stated in the Student Handbook.

Honor Code Pledge: "I pledge that I will neither give nor receive unauthorized aid on any test or assignment. I understand that plagiarism constitutes a serious instance of unauthorized aid. I further pledge that I exert every effort to ensure that the Honor Code is upheld by others and that I will actively support the establishment and continuance of a campus-wide climate of honor and integrity."

Individual Work Policy: All work on tests and the final exam is to be done on a **strictly individual basis**. (The final project will be assigned as a group project, and in that case you will be expected to work only with your fellow group members and to properly cite all external sources of information.) **The following items are not allowed during tests:** *baseball caps (or any other article of clothing that can easily conceal notes); audio or video players of any description; cell phones or other radio-frequency devices; calculators with programmable memory (unless you can prove to me that the memory is clear); any type of computing device including laptops, notebooks, tablets, e-book readers, smart phones, etc. I reserve the right to disallow other items at my discretion.* **Important: Cheating of any kind on a test or exam, or plagiarism in a research report, will result in a grade of F for the course for the *first offense*.** In addition to the above penalties, any student who is involved in an act(s) of academic dishonesty may be reported to the Honor Court for possible further action; penalties may include academic probation, suspension, or dismissal from UTC.

Course Attendance Policy: Students are expected to attend class regularly and to contact the instructor as soon as possible in the event they miss class so that they may be informed of material covered, schedule changes, upcoming tests, etc. Students are also advised to check their UTC e-mail and UTC Learn (Blackboard) regularly for information and announcements. There is no point penalty assigned for cutting class; however, the student is responsible for all material covered and all test/project due dates.

Course Participation/Contribution: Students are expected to read the assigned sections in the textbook, pay attention in class, and ask questions about any aspect of the material they do not understand.

Optional Participation in Student Response System: This semester, I am going to experiment with the use of a student response system as a means of increasing student interest in class and engagement with the material. At various points during class, I will present questions relevant to the material we are currently discussing. Interested students will have the option to respond to these questions using the Socrative response system (www.socrative.com). The system is accessible via a free student app (available for iOS, Chrome, and Android, see https://www.socrative.com/apps.html) or through a web browser on a laptop or mobile device. To participate in these interactive polls, students should launch the mobile app or point their browser to the student login page at https://b.socrative.com/login/student/ and login with the room name CPEN4700. Registration is not required, but in order for me to know who is participating, you will be asked to enter your name when responding. *While there is no requirement to participate in the student response system and there is no point penalty for not participating, I will consider awarding bonus points to students who participate most frequently, have the most correct responses, etc.* (Keep in mind that I am just trying this out this semester to see if it makes the class more enjoyable and, hopefully, helps students better learn and remember the course material.)

Courtesy Policy: Please do not use cell phones or other communications devices in class (except to participate in the student response system). If you have one, please turn it off or silence it so that it will not distract others or interrupt class. If your personal communication device rings, beeps, or makes any other audible sounds during class you may be asked to leave. If you have a unique situation (such as an illness in the family, etc.) that requires you to leave your device on during class, please inform me of the situation before class and sit near an exit to minimize disruption. Also, please refrain from using laptops, tablets, or other computing devices during class unless for the purpose of taking notes (no e-mail, web surfing, social networking, working on assignments or other projects, etc.) or participating in the student response system. It is OK to make recordings of the lecture if you wish, for personal or small group study use only; however, I reserve copyright and do not grant permission to distribute such recordings to anyone not enrolled in the class.

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve the learning experience at UTC. Toward the end of the semester, you will receive a link to evaluations and are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

Course Calendar/Schedule: A detailed schedule for the course, showing all test dates and assignment due dates, is posted in UTC Learn. A summary of other important dates follows: Classes begin – Monday, January 8; last day to register – Sunday, January 14; last day to drop without a "W" – Sunday, January 21; MLK Day holiday – Monday, January 15; mid-term grades given out – February 19-March 2; Fall break – March 10-18; last day to drop with a "W" – Monday, March 19; Spring holiday – Friday, March 30; last day of classes – Monday, April 23; Reading Day – Tuesday, April 24; final exam for this course – Thursday, April 26 (1:00 – 3:00 p.m.).

Computer Networks
CPSC 4550 (42534)
Fall 2017

COURSE:	CPSC 5590, 42534 - 0
TITLE:	Computer Networks
CLASS SCHEDULE:	ONLINE
CLASS LOCATION:	ONLINE
CREDIT:	3 credit hours
PROFESSOR:	Dr. Farah Kandah
OFFICE LOCATION:	EMCS 313A
OFFICE PHONE:	(423) 425 – 4395
OFFICE HOURS:	By appointment via email
E-MAIL:	Farah-Kandah@utc.edu

ACCOMODATION STATEMENT:
If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, call the Disability Resource Center (DRC) at 425-4006 or come by the office, 102 Frist Hall http://www.utc.edu/Administration/DisabilityResourceCenter/.

COUNSLING CENTER STATEMENT:
If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438 or http://www.utc.edu/Administration/CounselingAndCareerPlanning/.

COURSE DESCRIPTION:
The design of modern computer networks. Topics covered include the theory, design, engineering, installation, and performance analysis of networks to connect digital computers. The course will prepare students to plan, implement, and evaluate a network. Also includes peer-to-peer networks, the client-server model, network operating systems, mobile wireless network, and etc. The network and implementation tools may vary to meet current development trends.

PREREQUISITES:
CPSC 5020 or placement or department head approval.
Anyone who takes a course without the required prerequisites can be dropped from the course, and they may forfeit their fees.

COURSE OBJECTIVES:
- Students will understand general-purpose computer networks.
- Students will master the principles and concepts on computer networks.
- Students will grasp advanced topics including wireless network, multimedia networking, and network security.
- Students will be able to apply network principles into computer network applications.
- Students will gain ability of research in the area of computer networks.

GRADE WEIGHING SCHEME:

Component	**Weight towards the final grade**
Midterm Exam	25%
Final Exam	25%
Quizzes	10%
Assignments	20%
Labs	20%

GRADE DISTRIBUTION:

Grade	Range
A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	Below 60

TEXTBOOK:
Required: Computer Networking: A Top Down Approach, 7th edition, Kurose
ISBN: 978-0-13-3594140

COURSE WEBSITE AND COMMUNICATION:
We will be using UTC Learn system. You may access lecture notes, assignments, labs, and your grades through this system. The instructor will also use UTC Learn system to communicate with you via email. Therefore, it is very important that your UTC email address is current. If you do not read your UTC email, please have it go to the address you do read. Failure to read an email will not relieve you of the responsibility of knowing the information.
If you have a problem with accessing your UTC email account, contact the Help Desk at (423) 425-4000.
I can be reached by email during the week. I generally read my email on the weekend but CANNOT guarantee I will read or answer my email on the weekend. I will also NOT guarantee I will answer my email after 6 pm, which includes the night before the exams. Please email your instructor again if you do not hear feedback in two days.

MATERIAL:
Your UTC Learn (Blackboard) account login information.

COURSE OUTLINE:
The course outline will be available at UTC Learn (Blackboard) and will be updated weekly.
It is the student responsibility to follow up with the course outline.

ATTENDANCE POLICY:
If you must miss a test, for any reason, it is your responsibility to notify the instructor BEFORE the test is given.

GRADING POLICIES:
Assignments and Labs:

- Almost every week there will be an assignment/lab. Exam and assignment questions will be extracted from the material covered from both the lectures and labs.
- All assignments/labs will be announced and posted on UTC Learn.
- Assignments/Labs must be turned in through UTC Learn and will not be accepted through emails. You will have at least 1 week to complete each assignment/lab.
- All assignments/Labs are to be turned on or before the ASSIGNED DUE DATE.
- Discussion of concepts and ideas with others is encouraged. However, ALL ASSIGNMENTS/LABS ARE NOT INTENDED AS A GROUP WORK UNLESS SPECIFIED BY THE ASSIGNMENT/LAB. Group or copied work would be construed as plagiarism.
- LATE SUBMISSIONS (Home or Lab Assignment) will be docked 50% during the next week after the due date. Assignment will not be accepted after one week from the due date.
- UTC Learn submissions are time-stamped.

Exams:

- Cheating on an exam or plagiarizing others' work will result in a ZERO grade, and possibly further disciplinary action (grade "F" for this course).
- If you cannot make an exam/test period for any reason, you must notify the instructor as far in advance as possible.
- If you dispute the grading of any material, you have TWO WEEKS from the date the grade is recorded to request a change in the grade. After this time, no alterations will be considered.

Make-Up Tests/Assignments/Labs:

- In general, there will be NO Makeup tests. This will be done on a case-by-case basis. Significant emergencies do not include "I forgot."
- If you are unable to take a test, the grade of your final exam will be submitted for that grade.
- Failure to take the FINAL EXAM will result in a ZERO.
- There will be no make-ups for assignments, quizzes or labs.

HONOR CODE:

Please uphold the academic honor code (http://www.utc.edu/Departments/fcouncil/FacultyHandbook/Ch5Handbook.pdf).

Violations will be reported to the office of Student Development for investigation and penalties.

Appendix H. Graduate Syllabi Examples

Advanced Computer Architecture

Spring 2018

CPSC 5700-0, CRN 21110, online course, 3 credit hours

Instructor: Dr. Joe Dumas

E-mail and Phone Number: Joe-Dumas@utc.edu, (423) 425-4084. On days when classes are in session, you can expect e-mails to be answered within 24 hours. Response time may be longer over weekends and holidays, or if I am traveling out of town (*e.g.* to a conference). If you need immediate assistance and I am not in my office, please contact CSE administrative specialist Ms. Eva Hunter at (423) 425-4349 or Eva-Hunter@utc.edu.

Office Hours and Location: EMCS 313C – office hours will be posted on my office door. If you would like to make an appointment for a specific time, please e-mail me with possible dates/times you could meet.

Course Meeting Days, Times, and Location: Online class – meets via UTC Learn (Blackboard). Students may optionally sit in on the lectures for the undergraduate Computer Architecture class which meets Tuesdays and Thursdays from 1:40 to 2:55 p.m. in EMCS 301.

Course Catalog Description: An advanced course in computer architecture. Topics may include classical uniprocessor architecture, parallel processing architectures, computer arithmetic, instruction sets, control unit design, instruction and arithmetic pipelines, CISC, RISC, superscalar and superpipelined architectures, memory hierarchies, cache and virtual memory mechanisms, and I/O operations. Prerequisite: CPSC 5020 or placement or department head approval. Standard letter grade. Differential Course Fee will be assessed.

Course Pre/Co Requisites: *CPSC 5020 (or CPSC 2800 and CPEN 3700), or placement based on work completed at another institution, or department head approval. If you have any doubts regarding your preparation to take this course, please discuss your situation with me as soon as possible.*

Course Student Learning Outcomes: This course will amplify and expand upon the fundamentals of computer system organization and architecture covered in the undergraduate courses CPSC 2800 and CPEN 3700 (or the graduate foundation course CPSC 5020, or a similar course(s) taken at another institution). Students will learn about the history and evolution of computer architectures and will become conversant with many of the terms and concepts used in the field of modern computer system design. Topics of particular interest will include von

Neumann and non-von Neumann architectures; performance measures and benchmarking; data representations and arithmetic hardware; register and instruction sets; control unit design; pipelining; CISC, RISC, superpipelined, superscalar, VLIW, and multithreaded architectures; parallel processing; exceptions and I/O techniques; cache memory; and memory management systems.

Course Fees: CECS Differential Course Fee applies.

Required Course Materials: Textbook: Dumas, Joseph D. II. *Computer Architecture: Fundamentals and Principles of Computer Design*, Second Edition, CRC/Taylor & Francis, 2017. ISBN 978-1-4987-7271-6.

Supplemental/Optional Course Materials: Supplemental materials, if needed, may be provided via UTC Learn. An optional supplementary text is: Stokes, Jon. *Inside the Machine: An Illustrated Introduction to Microprocessors and Computer Architecture*, No Starch Press, 2007. ISBN 1-59327-104-2.

Technology Requirements for Course: Students will need a computer with a web browser that is compatible with UTC Learn (Blackboard) in order to access and submit assignments. If you are not sure whether your browser is supported, please visit the following link: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support/Browser_Checker The reports for each assignment will require students to use a word processor (*e.g.* Microsoft Word) and produce a DOC, DOCX, and/or PDF file to submit for grading. Students may do this on their own, personal computers or in any of the CSE department labs (EMCS 306, 312, 321) when they are not in use by another class. Some of the assignments will require students to download and/or run software (*e.g.* benchmark programs, Telnet/FTP clients, a digital logic simulator, a spreadsheet program, etc.) on a Windows-based personal computer. (Students may optionally use Macintosh computers if they have access to equivalent software, but I do not provide support for Macs.) One assignment will require students to install and run software from the command line in a Unix/Linux environment.

Technology Skills Required for Course: Students must be able to navigate the UTC Learn site using a web browser in order to access and submit the assignments, view other course information, and participate in the class discussion forum. Students also need to be able to use a word processor to create and save files, and must possess basic file manipulation skills in a Windows environment. Students need to be familiar with binary and hexadecimal arithmetic, logic gates, and other basic digital logic circuits introduced in CPSC 5020 or CPEN 3700.

Technology Support: If you have problems with your UTC e-mail account or with UTC Learn, contact the IT Solutions Center at 423-425-4000 or e-mail itsolutions@utc.edu.

Course Assessments and Requirements: Grades will be based on your performance on several graded textbook section/literature reviews, several assignments, class participation (based on the

quantity and quality of your posts to the class discussion forum on UTC Learn), a journal article review, and a final project (which will serve as the final examination for the course). Each of these grading components will be described further below. You will also be given reading assignments from the textbook and/or other sources; these will not be graded in and of themselves, but I will expect your understanding of the reading material to be reflected in graded work and class discussion. Your final numerical average for the course will be based on the following weighting: Textbook section/literature reviews (overall average), 30%; assignments (overall average), 30%; class participation, 10%; journal article review, 10%; final project (serves as final exam), 20%.

Course Grading

Course Grading Policy: Letter grades for the course will be assigned on the following scale: 90.00 or higher, A; 80.00 - 89.99, B; 70.00 - 79.99, C; 60.00 – 69.99, D; less than 60.00, F. Grades for each review, assignment, and project will be posted in the UTC Learn grade center.

Instructor Grading and Feedback Response Time: Assignments will be graded and returned as soon as possible, usually within 3-4 days, although turnaround time may be up to a week or more at busy times of the semester. Graded papers will be available for pickup from my office or, if it is more convenient, I may return them to you electronically. If you have any questions about your grade, contact me as soon as possible. **I will not adjust scores any later than one week after the grade for the item in question has been posted in the UTC Learn grade center.**

Course and Institutional Policies

Late/Missing Work Policy: Make sure you are aware of and respect all due dates. *Late reviews, assignments, or projects will be penalized substantially (if they are accepted at all) unless a medical or other legitimate, documented excuse is provided.* Since the course is online and you will be aware of due dates in advance, you should have no direct conflicts and you are expected to manage your time effectively in order to get each item submitted by the due date. (Specific instructions for electronic submission of assignments will be provided; generally, you will be expected to submit items via e-mail as attachments and/or use the digital assignment submission feature of UTC Learn.) If something serious, unanticipated and/or unavoidable (*e.g.* an auto accident or serious illness) comes up at the last minute, notify me as soon as possible and I will give appropriate consideration to your situation.

Student Conduct Policy: UTC's Academic Integrity Policy is stated in the Student Handbook.

Honor Code Pledge: "I pledge that I will neither give nor receive unauthorized aid on any test or assignment. I understand that plagiarism constitutes a serious instance of unauthorized

aid. I further pledge that I exert every effort to ensure that the Honor Code is upheld by others and that I will actively support the establishment and continuance of a campus-wide climate of honor and integrity."

Individual Work Policy: All work on textbook/literature/journal article reviews, assignments, and the final project is to be done on a **strictly individual basis** unless I specifically notify you that a group assignment is being given and assign you to a group. Individual assignments may be discussed with other students (or outside parties) in a general sense only … **all work handed in is to be your own**. Credit may be reduced or denied for any work which has apparently been copied or which is substantially identical to that of another student(s) or group(s). **Important: Cheating of any kind, or plagiarism in a review or project report, is grounds for assignment of a grade of F for the course for the first offense. Repeated or egregious instances of duplicated work on assignments are also grounds for assignment of a failing grade**. In addition to the above penalties, any student who is involved in an act(s) of academic dishonesty may be reported to the Honor Court for possible further action; penalties may include suspension or dismissal from UTC.

Course Attendance Policy: Students are expected to "attend" class regularly by logging into UTC Learn (if for any reason the system goes down, feel free to e-mail or call the instructor to check for updates). Students are also expected to participate in class by reading and responding to posts in the class discussion forum on UTC Learn (see the section on **Course Participation/Contribution** below).

Course Participation/Contribution: Students are expected to log on to UTC Learn regularly to check for announcements and assignments and, most particularly, to participate in the class discussion forum. Since this is a class that meets online only, and we do not have an assigned class meeting time/location where students can interact with each other and the instructor, the discussion forum is our primary means of achieving that essential interaction. You will be assigned a grade for class participation based on the quantity and quality of your posts to this forum. *Please note that I expect participation to be consistent and regular; a student who posts intelligent and thought-provoking messages multiple times per week, every week will score considerably higher than a student with a lot of "me too" type posts and/or who posts nothing at all for many days or weeks and then submits a flurry of messages to "make up" for the inactivity.* The general guidelines are that each student should post at least 3 times per week, on at least 3 different days, on topic, at a graduate level of understanding, and approximately 150 words or more each time.

Textbook Section/Literature Reviews: Several times during the semester, students will be given a specific section(s) of the textbook to critically review, summarize, and relate to other available sources in a written paper several (at least 5 but not to exceed 10) pages in length. (Students will be assigned a different section[s] for each review.) For each of these assignments, you will be expected to read and thoroughly understand the assigned material (asking questions

of the instructor and/or using the class discussion forum for input from your fellow students as needed), supplement your reading by locating other sources (such as print or online articles) that deal with the same topic, and write up an original review that summarizes the knowledge you have gained.

Assignments: Several times during the semester, students will be given assignments to undertake specific exercises or tasks related to computer architecture; for example, benchmarking system performance or simulating aspects of system behavior. Specific and more detailed instructions will be given for each assignment. In general, you will be expected to turn in your results (in whatever form is appropriate) along with a professional write-up analyzing the results at a graduate level of understanding.

Journal Article Review: Some time toward the end of the semester you will be assigned (or possibly allowed to pick) an article in a scholarly journal with a focus on computer architecture topics. In a manner similar to the textbook section/literature reviews, you will be expected to summarize and critically review the article, relating it to material you learned from the textbook, class discussion, and any other sources of information in an original written paper several (at least 5 but not to exceed 10) pages in length.

Final Project: Each student (or small group of students, at instructor discretion) will be assigned (or allowed to pick, subject to instructor approval) a topic to research for his or her final project, which will serve as the culminating experience and final examination for the course. Project topics will be unique to each student/group and will be assigned on a first-come, first-served basis. (You are encouraged to contact me with your ideas for potential projects early in the course so you can get topic approval and make an early start, rather than waiting until the last few weeks of the course.) One type of final project would be a detailed report on the architecture and hardware/software implementation of a particular computer system (past or present). An alternative type of project would be a practical investigation of some important topic in computer architecture (perhaps similar to, but in more depth than, one of the assignments); possible examples might include a comparison of cache/non-cache performance in some given computer system(s), benchmarking the performance of compiled high-level language programs on systems with different interconnection networks or pipeline structures, etc. For the first type of project, I would simply need to know the model name/number and manufacturer of the system you plan to investigate; for the second, I would need a 1-2 page written prospectus of the project to review for approval. Regardless of the specific project topic, a lengthy (20+ pages), detailed, well-referenced, and professional written report, demonstrating understanding at a graduate level, will be required.

Course Learning Evaluation: Course evaluations are an important part of our efforts to continuously improve the learning experience at UTC. Toward the end of the semester, you will receive a link to evaluations and are expected to complete them. We value your feedback and appreciate you taking time to complete the anonymous evaluations.

Course Calendar/Schedule: Due dates for assignments and papers will be communicated via UTC Learn and/or e-mail. A summary of other important dates follows: Classes begin – Monday, January 8; last day to register – Sunday, January 14; last day to drop without a "W" – Sunday, January 21; MLK Day holiday – Monday, January 15; mid-term grades given out – February 19-March 2; Fall break – March 10-18; last day to drop with a "W" – Monday, March 19; Spring holiday – Friday, March 30; last day of classes – Monday, April 23; Reading Day – Tuesday, April 24.

Advanced Computer Networks
CPSC 5590 (49299)
Fall 2017

COURSE:	CPSC 5590, 49299 - 0
TITLE:	Advanced Computer Networks
CLASS SCHEDULE:	ONLINE
CLASS LOCATION:	ONLINE
CREDIT:	3 credit hours
PROFESSOR:	Dr. Farah Kandah
OFFICE LOCATION:	EMCS 313A
OFFICE PHONE:	(423) 425 – 4395
OFFICE HOURS:	By appointment via email
E-MAIL:	Farah-Kandah@utc.edu

ACCOMODATION STATEMENT:
If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, call the Disability Resource Center (DRC) at 425-4006 or come by the office, 102 Frist Hall http://www.utc.edu/Administration/DisabilityResourceCenter/.

COUNSLING CENTER STATEMENT:
If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438 or http://www.utc.edu/Administration/CounselingAndCareerPlanning/.

COURSE DESCRIPTION:
The design of modern computer networks. Topics covered include the theory, design, engineering, installation, and performance analysis of networks to connect digital computers. The course will prepare students to plan, implement, and evaluate a network. Also includes peer-to-peer networks, the client-server model, network operating systems, mobile wireless network, and etc. The network and implementation tools may vary to meet current development trends.

PREREQUISITES:
CPSC 5020 or placement or department head approval.
Anyone who takes a course without the required prerequisites can be dropped from the course, and they may forfeit their fees.

COURSE OBJECTIVES:
- Students will understand general-purpose computer networks.
- Students will master the principles and concepts on computer networks.
- Students will grasp advanced topics including wireless network, multimedia networking, and network security.
- Students will be able to apply network principles into computer network applications.
- Students will gain ability of research in the area of computer networks.

GRADE WEIGHING SCHEME:

Component	**Weight towards the final grade**
Midterm Exam	25%
Final Exam	25%
Quizzes	10%
Assignments/Projects	40%

GRADE DISTRIBUTION:

Grade	Range
A	90 – 100
B	80 – 89
C	70 – 79
D	60 – 69
F	Below 60

TEXTBOOK:
Required: Computer Networking: A Top Down Approach, 7th edition, Kurose
ISBN: 978-0-13-3594140

COURSE WEBSITE AND COMMUNICATION:
We will be using UTC Learn system. You may access lecture notes, assignments, labs, and your grades through this system. The instructor will also use UTC Learn system to communicate with you via email. Therefore, it is very important that your UTC email address is current. If you do not read your UTC email, please have it go to the address you do read. Failure to read an email will not relieve you of the responsibility of knowing the information.
If you have a problem with accessing your UTC email account, contact the Help Desk at (423) 425-4000.
I can be reached by email during the week. I generally read my email on the weekend but CANNOT guarantee I will read or answer my email on the weekend. I will also NOT guarantee I will answer my email after 6 pm, which includes the night before the exams. Please email your instructor again if you do not hear feedback in two days.

MATERIAL:
Your UTC Learn (Blackboard) account login information.

COURSE OUTLINE:
The course outline will be available at UTC Learn (Blackboard) and will be updated weekly.
It is the student responsibility to follow up with the course outline.

ATTENDANCE POLICY:
If you must miss a test, for any reason, it is your responsibility to notify the instructor BEFORE the test is given.

GRADING POLICIES:
Assignments and Labs:

- Almost every week there will be an assignment/lab. Exam and assignment questions will be extracted from the material covered from both the lectures and labs.

- All assignments/labs will be announced and posted on UTC Learn.
- Assignments/Labs must be turned in through UTC Learn and will not be accepted through emails. You will have at least 1 week to complete each assignment/lab.
- All assignments/Labs are to be turned on or before the ASSIGNED DUE DATE.
- Discussion of concepts and ideas with others is encouraged. However, ALL ASSIGNMENTS/LABS ARE NOT INTENDED AS A GROUP WORK UNLESS SPECIFIED BY THE ASSIGNMENT/LAB. Group or copied work would be construed as plagiarism.
- LATE SUBMISSIONS (Home or Lab Assignment) will be docked 50% during the next week after the due date. Assignment will not be accepted after one week from the due date.
- UTC Learn submissions are time-stamped.

Exams:

- Cheating on an exam or plagiarizing others' work will result in a ZERO grade, and possibly further disciplinary action (grade "F" for this course).
- If you cannot make an exam/test period for any reason, you must notify the instructor as far in advance as possible.
- If you dispute the grading of any material, you have TWO WEEKS from the date the grade is recorded to request a change in the grade. After this time, no alterations will be considered.

Make-Up Tests/Assignments/Labs:

- In general, there will be NO Makeup tests. This will be done on a case-by-case basis. Significant emergencies do not include "I forgot."
- If you are unable to take a test, the grade of your final exam will be submitted for that grade.
- Failure to take the FINAL EXAM will result in a ZERO.
- There will be no make-ups for assignments, quizzes or labs.

HONOR CODE:

Please uphold the academic honor code (http://www.utc.edu/Departments/fcouncil/FacultyHandbook/Ch5Handbook.pdf).

Violations will be reported to the office of Student Development for investigation and penalties.

UTC COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

ORAL COMMUNICATION RUBRIC FOR GRADUATE STUDENTS

Name of Student: _____ **Major:** _____ **Date:** _____

Instructions: Please mark your score in the last column for each category as described below, and put your total score in the last row.

	1	2	3	4	Score
Organization	Unclear focus, no background information, no outline	Clear focus but no background information, little or no outline	Development is clear with a well- defined outline, but transitions need refinement	Development is clear through use of specific and appropriate examples; transitions are clear and create a succinct and even flow	
Content	Topic is unclear, information appears randomly chosen, poor application of fundamentals	Topic is clear, but supporting information is disconnected and shows poor application of fundamentals	Topic is clear and contains many relevant points and appropriate application of fundamentals, but somewhat unstructured	Exceptional use of material that clearly relates to the focus; abundance of various supported materials	
Presentation Length	Greatly exceeding or falling short of allotted time	Exceeding or falling short of allotted time	Remained close to the allotted time	Presented within the allotted time	
Visual Aids	Poor selection and use of visual aids technology, and not readable images	Appropriate selection and use of visual aids, but use of poorly resolved images	Appropriate selection and use of visual aids, well-focused images	Very good selection and use of visual aids with clearly readable images that complimented talk	
Attention to Audience	No attempt to engage audience	Little attempt to engage audience	Engaged audience and held their attention most of the time	Engaged audience and held their attention throughout with creative articulation, enthusiasm, and clearly focused presentation	
Speaking Skills	Monotone; speaker seemed uninterested in material	Little eye contact; fast speaking rate, little expression, mumbled	Clear articulation of ideas, but some lack of confidence with material	Exceptional confidence with material displayed through poise, clear articulation, eye contact, and enthusiasm	
Comments:				**TOTAL SCORE**	

Name of Reviewer: _____ **Signature of Reviewer:** _____

WRITTEN COMMUNICATION RUBRIC FOR GRADUATE STUDENTS

Name of Student: _____ **Major:** _____ **Date:** _____

Instructions: Please mark your score in the last column for each category as described below, and put your total score in the last row.

	1	2	3	4	Score
Drafting	Requires excessive guidance and prompting from teacher. Is unable to write independently.	Requires occasional guidance and prompting from teacher to write independently. Written work is inconsistent.	An independent writer who requires little guidance or prompting from teacher to write. Written work is usually detailed and creative.	Requires no guidance or prompting from teacher to write independently. Written work is creative and detailed. Student enjoys writing.	
Editing	Student often ignores peer and teacher edits, turning in final products with grammatical and spelling errors. Student does not edit his or her own work at all.	Student accepts peer and teacher edits, but does not edit his or her own work.	Student accepts peer and teacher edits. Student usually edits his or her own work, catching accidental grammatical and spelling errors.	Student accepts peer and teacher edits. Student is also exceptionally meticulous about editing his or her own work, catching most grammatical and spelling errors.	
Revision	Student resists the revision process, making few or no changes from first to final draft.	Student makes minor revisions when necessary. Accepts some constructive criticism from teacher.	Student accepts constructive criticism well from peers and teachers and often comes up with creative and appropriate revision ideas of his or her own.	Student makes full use of the revision process, soliciting and accepting constructive criticism from peers and teachers and implementing his or her own ideas for revision.	
Final Draft	Final draft shows little evidence of editing and revision.	Final draft shows some evidence of editing and revision.	Final draft shows clear evidence of editing and revision.	Final draft shows clear evidence of thoughtful editing and revision.	
Attitude	Shows no enthusiasm for or commitment to the writing process.	Shows some enthusiasm for and commitment to the writing process.	Usually shows enthusiasm for and commitment to the writing process.	Shows exceptional enthusiasm for and commitment to the writing process.	
Timing	Student does not submit any written work on time.	Student submits the work on time with minimum changes.	Student submits the work on time with required changes.	Student submits the work on time with required changes and by providing additional writing materials.	
Comments:				**TOTAL**	

Name of Reviewer: _____ **Signature of Reviewer:** _____