William J. Tomlinson, Jr.

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OBJECTIVE

To obtain research oriented work experience with an emphasis in developing hardware and software systems for wireless communication, with a special interest in: Intra-Body Communication/Networks, Wearable Devices, Structural Health Monitoring and the Internet of Things.

EDUCATION

- *Ph.D., Computer Engineering,* Cumulative GPA 3.70, Expected May 2018, Northeastern University, Boston, MA
- *M.S., Electrical Engineering*, Cumulative GPA 3.71, Michigan State University, East Lansing, MI
- *B.S., Electrical Engineering*, Cumulative GPA 3.83, Summa Cum Laude**,** North Carolina A&T State University, Greensboro, NC

RESEARCH EXPERIENCE

GEM-Draper Lab Fellow *Northeastern University* *Boston, MA* *Aug 13 –Present*

- Evaluating the feasibility of using weak electrical current for communication among networked medically implantable devices
- Conducting the design and development of low power, physical layer, intra-body communication systems using weak electrical current for data transmission
- Developing a wearable prototype for intra-body communication applications in the area of mobile/personal device authentication

Graduate Research Assistant *Michigan State University* *East Lansing, MI* *Aug 12 –August 13*

- Assisted in the development of a pulse based ultrasonic communication systems to perform multi-hop networking and other necessary MAC-Routing operations for application in the area of low-information networking and energy-constrained event monitoring
- Developed a Serial to Bluetooth interface to allow a Cricket node to enable communication with an Android smartphone, for the purpose of improving a distributed monitoring system, with the functionality of measuring human social interaction

WORK EXPERIENCE

Research Engineer Intern *Samsung Research America* *Mountain View, CA* *May 17 – Aug 17*

- Member of the Think Tank Team, within Samsung Research America
- Designed and developed a prototype Transmitter and Receiver for application in Intra-Body Communication by means of an embedded system with supporting analog front end hardware
- Designed and developed a printed circuit board to support a wearable implementation of the Intra-Body Communication Transmitter and Receiver architecture
- Researched potential design modifications to an existing Samsung product to enable Intra-Body Communication

Wireless Communications Research Intern *Intel Corporation* *Santa Clara, CA* *May 16 – Sep 16*

- Member of the Emerging Connectivity Solutions Team, under Wireless Communications Research within Intel Labs
- Contributed to the development and design of a Low Power Wake-Up Receiver (LP-WUR) by researching solutions and developing simulation code to study and evaluate areas of possible performance improvement
- Researched the design and development of next generation of Wi-Fi and other connectivity solutions

PUBLICATIONS

- ***W.J. Tomlinson***, K. R. Chowdhury, and C. Yu, G*alvanic Coupling Intra-Body Communication Link for Real-Time Channel Assessment*, In Proceedings of IEEE INFOCOM Posters and Demos, San Francisco, CA. April. 2016.
- ***W.J. Tomlinson***, K. R. Chowdhury, and C. Yu, G*alvanic Coupling Intra-Body Communication Link for Real-Time Channel Assessment*, In Proceedings of IEEE INFOCOM Posters and Demos, San Francisco, CA. April. 2016.
- ***W. J. Tomlinson***, F. Arbaca, K. R. Chowdhury, M. Stojanovic and C. Yu, *Experimental Assessment of Human-Body-Like Tissue as a Communication Channel using Galvanic Coupling*, In Proceedings of 12th International Conference on Wearable and Implantable Body Sensor Networks, Cambridge, MA. June. 2015.
- ***W. J. Tomlinson***, K. R. Chowdhury and C. Yu, *A Multi-Cast Communication Scheme Using Weak Electrical Current for Intra-Body Networks*, In Proceedings of 9th International Conference on Body Area Networks, London UK, Sept. 2014.
- ***W. J. Tomlinson***, B. Dong, S. Lorenz, and S. Biswas, *Node Localization via Analyzing Multi-path Signals in Ultrasound Sensor Networks*, In Proceedings of SPIE Defense, Security, and Sensing Symposium (Sensing, Localization, and Processing IX), Baltimore, MD, May 2014.

PROJECTS

MS Thesis: Node Localization via Analyzing Multi-path Signals in Ultrasonic Sensor Networks

- Developed a theoretical and run-time system capable of achieving source node localization on an aluminum medium, using ultrasonic waves as the method of communication. In contrast to traditional localization techniques (e.g., triangulation and trilateration), this thesis was implemented with a single source node and reference node. Using the multipath reflected signals in conjunction with pattern classification techniques, cell based localization is performed with achievable accuracy greater than 95%. Applications of such a system exist in the realm of structural health monitoring, where the location of structural faults and defects need to be determined.

SKILLS/ABILITIES

C++	MATLAB	C	Assembly	LabVIEW	System Design
PSpice	CORE	PCB Design	MAC Protocol Design	R	System Integration