Jacob A. Bills

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Bio

Jacob is an undergraduate researcher in the School of Computing at the University of Utah; his research has focused on the impacts and mitigation of interference on wireless communication with software-defined radios, programmability within the radio access network, and vehicle-to-everything communications.

Objective

Complete an undergraduate thesis that is related to my current research into wireless interference and V2X communication technologies.

Education

University of Utah Salt Lake City, Utah
B.S. Computer Engineering GPA 3.76
Expected Graduation Dec 2021

Work Experience

School of Computing

Undergraduate Research Assistant May 2020 – Present

- Explored wireless signal parameters in a controlled RF matrix on the PhantomNet testbed
- Instantiated end-to-end LTE network using SDRs and COTS UE on the POWDER wireless testbed
- Evaluated performance impacts of co-channel interference and signal jamming on established LTE connection
- Investigated the impacts of programmability in the RAN for the establishment of a NRDZ
- Observed impact of WiFi and u-LTE on V2X networks in response to an FCC rule change

Department of Electrical and Computer Engineering

Teaching Assistant | ECE 2240 Jan 2020 – May 2020

- Instructed a weekly lab session for Intro to Electric Circuits
- Aided students with RLC circuit design for both labs and assignments
- Provided students with in-person and remote homework help during the week
- Assisted in the development of modified coursework during the transition to online learning for COVID-19

Pathology IT Department

Office Assistant Feb 2019 – Jan 2020

- Assisted with administrative duties within the department
- Processed documents and entered them into the knowledge base
- Prepared computers for retirement and surplus sales
- Ensured compliance with HIPPA standards for a secure chain of data destruction

Coding Languages

Preferred: C/C++
Proficient: Python, Java, C#, MATLAB, x86, Verilog HDL, LaTeX, Docker

Projects

Secure Network Messaging | Python

- Built a client server setup for secure messaging across a network
- Used RSA key pairs for message security and authentication
- Used SHA1 and 3DES for securing communication and ensuring CIA

Dynamic Memory Allocator | C

- Designed a custom implementation of Malloc
- Maximized speed and latency performance
- Outpaced average performance by 10%

Flight Optimizer | Java

- Built a tool that found optimal routes based on cost
- Handled multiple cost parameters like dollars or time
- Searched an imported list of weekly flights

Space Wars | C#

- Developed a networked game using both a client and server
- Ensured smooth operation with over a dozen concurrent clients
- Streamlined network performance to reduce latency in a multiplayer environment
- Produced a GUI for user interaction with game and integrated menus