

# Jacob A. Bills

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## Bio

Jacob Bills is in his final year studying Computer Engineering at the University of Utah and plans to attend graduate school in Computer Science post-graduation. He has a strong interest in computer networking and his coursework has focused on computer systems. 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 and programmability within the radio access network. His most recent work focuses on observing and quantifying interference from unregulated transmissions on 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

B.S. Computer Engineering

Salt Lake City, Utah

GPA 3.73

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 NR-DZ
- 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 HIPAA 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 DES3 for hashing and encrypting messages

### 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