

## Education

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Bachelor of Science in Computer Science, The University of Texas at Dallas  
Junior, Expected Graduation in May 2019

## Experience

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*\*As of August '17, I will intern at NASA Johnson Space Center in the Guidance, Navigation, and Control Systems Engineering Branch.*

### **Massachusetts Institute of Technology; Cambridge, MA**

*Research Affiliate — Haystack Observatory (June 2017 — August 2017)*

- Conducted a feasibility study of and developed a prototype avionics system for an air-dropped, data collecting, penetrator system to be used for autonomous antarctic research applications.
- The system I developed employed a master-slave configuration of an embedded system running Linux, and a priority-driven, data processing and recording subsystem using the real-time operating system, FreeRTOS.
- My completed prototype included C / C++ programs for remote communication and command via the Iridium satellite network, autonomous system health monitoring and process management, high-speed data collection, and power reduction optimizations.

### **NASA Johnson Space Center; Houston, TX**

*International Space Station On-Orbit Engineering (OB2) Intern (January 2017 — May 2017)*

- Developed a multiplatform (Android and iOS) mobile application in C# (using Xamarin) to have a read/write interface with the International Space Station Mission Evaluation Room (MER) Web System and various NASA / ISS resources.
- Created a user login and verification system, a SQLite database, and developed a tailored search functionality for the console log.

### **William B. Hanson Center for Space Sciences; Richardson, TX**

*Undergraduate Researcher (May 2016 — Present)*

- Developed a beacon satellite receiver to calculate total electron content (TEC) in the ionosphere. Investigated different methods of signal acquisition and built a nested Quadrifilar Helicoidal (QFH) antenna system.
- Wrote a signal recording and satellite tracking software in Python to automate the data acquisition process.

## Projects

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### **Visual Polygraph / Biometrics Device in OpenCV / Python — October 2017 (Independent Project)**

- Using the OpenCV Python library, I developed a rudimentary program to calculate heart rate visually (via a webcam). The project also utilized an Arduino to measure body temperature, perspiration, and speech patterns to calculate a user's stress.
- Based on a project by MIT CSAIL, the user's heart rate is calculated using changes in skin pigment as a subject's heart beats.

### **Enigma Machine in Verilog — November 2016 (Academic Project)**

- Developed a digitally encoded processing unit in Verilog to simulate a WWII Enigma Machine with 4 states - On, Reset, Encrypt/Decrypt, and Calibrate.
- The project used a testbench interface to encode and decode entire messages at a time.

### **iOS Road Conditions Detection and Reporting Application in Swift — September 2016 (Independent Project)**

- Created a mobile application to autonomously detect, verify, and report roads with rough pavement or potholes.
- The application utilizes the iPhone's GPS, gyroscope, and accelerometer to distinguish normal road conditions from ones unsafe.
- The city of Richardson received a \$25,000 grant from State Farm for continued development on the project.

### **Autonomous Satellite Tracking and Recording Software in Python — Summer 2016 (Research Project)**

- Forecasted satellite paths using Two Line Element (TLE) sets to automate the data retrieval process for our antenna.
- Programmed the satellite tracking code to work alongside the Software Defined Radio platform, GNURadio, to record specific satellite transmissions using an Ettus Research Universal Software Radio Peripheral (USRP).

## Programming Languages / Platforms

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C, C++, Python, SQLite, C#, Matlab, Arduino, Swift, Verilog, FreeRTOS, OpenCV, GNU Radio, and the UNIX Command Line

## Relevant Coursework

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Algorithm Analysis & Data Structures, Discrete Mathematics I & II, Linear Algebra, Computer Architecture, Digital Logic & Computer Design, Digital Systems Laboratory, Operating Systems Concepts, and Organization of Programming Languages

## Awards

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- 1st Place at MLH HackNAU 2017
- 1st Place at Richardson Community Hack Week 2016
- 1st Place for Best Microsoft Hack at TAMUHack 2015
- 1st Place for Best Drone Hack (State Farm) at TAMUHack 2015