MARK GOLDWATER

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EDUCATION

OLIN COLLEGE OF ENGINEERING **MAY 2021**

BACHELOR OF SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING

Recipient of four-year half-tuition merit scholarship valued at $100,800

GPA: 3.98/4.00

Relevant Coursework (through Spring 2020): Computer Architecture, Analog and Digital Communications, Controls, Microelectronic Circuits, Data Structures and Algorithms, Quantitative Engineering Analysis (Multivariable Calculus, Linear Algebra, Signals and Systems, Mechanics), Software Design, Software Systems, Discrete Mathematics, Bayesian Statistics.

SKILLS

- Python, Java, C++, MATLAB, C, Verilog, JavaScript, Ruby on Rails, Git.
- Basic CAD, 3D printer, basic machine shop tools.

EXPERIENCE

WOODS HOLE OCEANOGRAPHIC INSTITUTION **SUMMER STUDENT FELLOW** **JUNE – AUG 2020**

- Architected a convolutional neural network (CNN) using Python and Tensorflow to detect spectrograms of multi-modal dispersive calls from Southern right whales in large audio data.
- Achieved high accuracy and precision on multiple test data sets.
- Currently writing an extended letter for the Journal of the Acoustical Society of America.

RADIO-FREQUENCY/VISIBLE LIGHT COMMUNICATION **RESEARCH ASSISTANT** **SEPT 2019 - PRESENT**

- Selected infrared communication boards to transmit an acknowledgement on the uplink of a hybrid RF/visible light communication system to transmit.
- Enabled system to coexist on the same network with other 802.11 devices.
- Designed and implemented a digital circuit to process the acknowledgement signal.
- First author on paper accepted to IEEE International Symposium on Personal, Indoor and Mobile Radio Communication.

MIT LINCOLN LABORATORY **SUMMER RESEARCH PROGRAM INTERN** **MAY – AUG 2019**

- Developed a physical system to calibrate an infrared camera over multiple settings for use in a communication system testbed.
- Converted from pixel values of the camera's focal plane array to the power of an incident infrared beam.
- Used C/C++ and multi-threading libraries to write control code for the hardware used in the system, Python for creating hardware emulators for testing, and MATLAB for image processing.
- Developed signal processing algorithm in MATLAB to detect non-functioning camera pixels.

TRACK INFORMATION, INC. **SOFTWARE ENGINEER INTERN** **JUN – AUG 2018**

- Designed and prototyped RESTful API for a mobile app to track a user's health statistics using React Native in JavaScript as well as Ruby on Rails.
- Engineered the app's back-end dataflow to easily interface with third party APIs.
- App was used as a display of the product to investors.

PROJECTS

SCHROEDER REVERB IN C MARCH 2020

Implemented the DSP Schroeder reverberation algorithm in C to add a reverb effect to a mono-channel .wav file. Created custom buffer data structures, a .wav file parser, and digital comb and all pass filters.

AMERICAN SIGN LANGUAGE/ENGLISH TRANSLATION SYSTEM JULY 2019 – JANUARY 2020

Team received 1st place and funding from a competition at MIT Lincoln Laboratory to take a user-oriented approach to the creation of an ASL language model to facilitate translation from ASL to English and vice versa.

DIGITAL HARDWARE MORSE CODE DECODER DECEMBER 2019

Designed and simulated a digital hardware system which took Morse code input from a button and outputted the ASCII code for inputted letters on LEDs. The system was also successfully run on an FPGA. Our hardware decoded dots and dashes and used a finite state machine to determine which letters to output.

BRAILLE SHEET MUSIC PRINTER OCTOBER - DECEMBER 2018

Designed and built device that can convert digitized music into braille sheet music and print it. Personally, I focused on the design of the electrical system and the integration of the software, hardware, and electrical subsystem