

JULIA M. ARNOLD

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Portfolio: [julia-arnold.github.io](https://github.com/julia-arnold)

EDUCATION

Master of Engineering in Electrical Engineering

anticipated May 2022

Massachusetts Institute of Technology (MIT)

GPA: 5.0/5.0

Thesis: Ground Station Mixed-Signal PCB and SFP Ethernet-to-Optical Connector for the DORA CubeSat

Bachelor of Science in Electrical Engineering (Minor in Public Policy)

anticipated May 2022

Massachusetts Institute of Technology (MIT)

GPA: 4.9/5.0

Activities: WMBR Cambridge Radio Station General Manager & OTA Engineer, MIT Prison Education Initiative Co-President, Eta Kappa Nu (EECS Honor Society) Tutoring, Air Force ROTC

EXPERIENCE

Engineering Graduate Student

February 2021 - present

NASA Jet Propulsion Laboratory, Pasadena, California

- Building system onboard an FPGA with Microblaze soft processor core running Linux to transfer data at 10 Gbps between a transceiver and a router via SFP+ module to enable local wireless access
- Developing mixed-signal PCB interface between an optical ground terminal FPGA and control components
- Engineering team member of the Deployable Optical Receiver Aperture (DORA) project that aims to demonstrate 1 Gbps data rate for crosslink optical communication between multiple small spacecraft and a ground station

Satellite Communications Intern

May 2020 - September 2020

The MITRE Corporation, Dayton, Ohio

- Designed digital system to capture data packets and play back free-to-air (FTA) signals using Wireshark
- Wrote software to blindly scan and process RF satellite signals and differentiate between digital standards
- Utilized digital signal processing (DSP) to visualize Fourier representation with specific signal types and magnitudes

RF Systems Group Intern

June 2019 - December 2019

MIT Lincoln Laboratory, Lexington, Massachusetts

- Developed and tested analog PCBs for a CubeSat that will collect data on the radio emissions in Earth's ionosphere
- Designed and laid out passive filters to fit specifications that modeled more complex circuits' behavior
- Collected and analyzed S-parameter measurements to characterize antenna and board designs

Autonomy Technology Research (ATR) Center Intern

May 2017 - August 2018

Air Force Research Laboratory, Dayton, Ohio

- Analyzed Synthetic Aperture Radar (SAR) data to automatically classify targets according to type of vehicle
- Developed computer vision methods using convolutional neural networks and transfer learning to blend synthetically generated and measured data using MATLAB and Python; presented results at 2018 SPIE Defense+Security Symposium

SKILLS

Hardware: PCB design, FPGA development, prototyping & bench-testing (soldering, VNA, spectrum analyzer, etc.)

Software: Altium, MentorGraphics, SystemVerilog, PSPICE, Python, C/C++, MATLAB, Cadence, Keysight ADS, GNU Radio, Sentaurus TCAD, PSoC Creator, Arduino, Linux, MacOS, Windows

PUBLICATIONS

A. Talamante, et al. (incl. J. Arnold), "Deployable Optical Receiver Array CubeSat", Proc. Small Satellite Conference, Mission Operations and Autonomy, 263 (2021). <https://digitalcommons.usu.edu/smallsat/2021/all2021/263/>.

J. Arnold, L. Moore, and E. Zelnio, "Blending Synthetic and Measured Data using Transfer Learning for Synthetic Aperture Radar (SAR) Target Classification" in *Algorithms for Synthetic Aperture Radar Imagery*, Proc. SPIE Defense+Security (2018). <https://doi.org/10.1117/12.2304568>.