

# JULIA M. ARNOLD

jul@mit.edu ◇ 937.360.1030

110 2nd St, Apt 103  
Cambridge, MA 02141

## EDUCATION

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### Master of Engineering in Electrical Engineering

Massachusetts Institute of Technology (MIT)

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

*anticipated May 2022*

GPA: 5.0/5.0

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

Massachusetts Institute of Technology (MIT)

*Activities:* WMBR Cambridge Radio General Manager & OTA Engineer, MIT Prison Education Initiative Co-President

*anticipated May 2022*

GPA: 4.9/5.0

## TEACHING EXPERIENCE

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### 6.002 Circuits and Electronics HKN Tutoring

*September 2020 - May 2021*

- Worked with students to review and reinforce concepts from Circuits and Electronics course once a week

### Air Force ROTC

*September 2018 - May 2021*

- Designed and led a hands-on class each semester where 30 upperclassmen teach 65 underclassmen
- Trained cadets in key Air Force competencies, leadership and teamwork skills in class for two hours each week
- Delivered lessons and demonstrations on skills, while facilitating practice and giving feedback

## EXPERIENCE

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### 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

## RELEVANT CLASSES

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Analog Electronics, Digital Systems, Power Electronics Lab, CMOS Analog and Mixed-Signal Circuit Design, High Speed Communications Circuits, Solid State Circuits, Electromagnetics, Nanoelectronics & Computing Systems, Computation Structures, Signal Processing, Feedback System Design, and Intro to EECS via Embedded Systems

## PUBLICATIONS

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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>.