

# RYAN TSE

## Electrical Engineering and Math Student

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📍 College Park, MD

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*Electrical engineering and math student interested in novel applications of “pure” math to engineering problems, particularly in control theory, machine learning, and digital signal processing. Planning to complete a combined B.S./M.S. by Spring 2023 and to pursue a PhD. Previously worked on radar digital signal processing at Nuro, a self-driving delivery vehicle startup. Currently inventing a robust, geometry-inspired reinforcement learning alternative tailored to multi-agent control problems.*

## WORK EXPERIENCE

### Nuro

#### Intern (Radar)

📅 June 2020 – August 2021 📍 Mountain View, CA

Developed, simulated, and implemented digital signal processing algorithms for radars on self-driving delivery vehicles.

### Intelligent Automation Incorporated

#### Intern (Communications, Localization)

📅 June 2019 – August 2019 📍 Rockville, MD

Assisted in the hardware implementation of a bursty space-time continuous phase modulation receiver by analyzing quantization error. Assisted in developing indoor positioning system technology by modifying tracking filters to include IMU data.

### Naval Research Laboratory

#### Intern (Communications)

📅 May 2018 – August 2018 📍 Washington, DC

Developed an efficient bursty satellite ranging protocol in GNURadio. Applied control loops to correct for channel impairments and implemented packet protocols.

### Naval Research Laboratory

#### Intern (Localization)

📅 June 2017 – August 2017 📍 Washington, DC

Applied deep learning to vehicle trilateration.

## TOOLS

### Experienced:

Python C Matlab Java Git  $\text{\LaTeX}$  Linux

### Familiar:

C++ Verilog Rust GNURadio PyTorch  
Tensorflow Keras OpenCV OpenAI Gym

### Novice:

Simulink KiCAD Cadence JAX ROS  
AWS+GCP JS/HTML/CSS MIPS ASM

## EDUCATION

### University of Maryland

B.S. + M.S. in Electrical Engineering, B.S. in Mathematics

📅 Aug 2019 – Present

#### Select Completed Courses

(star indicates graduate level course)

- Linear Algebra
- Multivariable Calculus
- Differential Equations
- Probability Theory
- Advanced Calculus
- Partial Differential Equations
- Differential Forms
- Analog and Digital Electronics

- Digital Logic Design
- Computer Organization
- Systems Theory \*
- Communications Systems
- Optimization for Control \*
- Computational Methods

#### Select Current Courses:

- Optimal Control \*
- Controls Lab
- Wave Propagation
- Capstone Design: Accelerator Physics

## PROJECTS

### Computationally Approximated Manifold Control

#### Independent Research

📅 March 2021 - Present 📍 College Park, MD

Inventing a robust, geometry-inspired reinforcement learning alternative tailored to multi-agent control problems. Details and paper coming soon.

### Cyclotron Autotuner

#### Class Project

📅 January 2022 - Present 📍 College Park, MD

Designing a feedback law to control the frequency of the Maryland 5 MeV cyclotron and implementing it on a PCB.

### blair3sat

#### Team Founder, President, and RF Instrument Engineer

📅 2017 – 2019 📍 Rockville, MD

Developed a CubeSat to measure 3D ionospheric charge density profiles by receiving ground-based ionospheric sounders from space. Designed DSP algorithms for the instrument and lead the team in spacecraft engineering and fund seeking in an executive capacity. Secured \$6,000 of funding and two corporate partnerships in 6 months. Co-wrote conference presentation for SmallSat 2019.