

# Hamza Dugmag *Electrical and Computer Engineering Student*

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## SKILLS

### Hardware

Soldering, Oscilloscope, LTspice, KiCad, ModelSim, Raspberry Pi, Arduino, Vector Network Analyzer, Fusion 360, 3D Printing

### Software

Python (NumPy, Pandas, PyPlot, SciPy, PyTorch), C/C++, ROS, SystemVerilog, MATLAB, Assembly, Git, Docker, Unreal Engine

## PROFESSIONAL EXPERIENCE

### RTL Design Engineer — PEY Intern, Intel Corporation

- Engaged in design creation, verification, and performance optimization of Nios V, Intel's next-generation RISC-V embedded processor family for FPGAs.

May 2023 – present  
San Jose, CA, United States

### Robot Navigation Research Intern, UTIAS Autonomous Space Robotics Laboratory

- Generated water masks of Canadian lakes using GISs to create a Python-based simulation platform for evaluating different navigation algorithms.
- Developed a graphical user interface using ROS and ReactJS to track a Clearpath Heron autonomous surface vehicle and visualize its navigation policy.
- Conducted field tests in various lakes to validate mapping, localization, and navigation.

May 2022 – Aug 2022  
Mississauga, ON, Canada

### Engineering Academic Review Mentor, U of T Faculty of Applied Science and Engineering

- Hosted academic review sessions to support first-year Engineering Science students with their academic, professional, and personal goals.

Aug 2021 – Apr 2022  
Toronto, ON, Canada

### Machine Learning Research Intern, U of T Forcolab Group

- Investigated code clone detection models to compare Stack Overflow code snippets to programming language documentation.
- Optimized parameters for hierarchical density-based clustering of Stack Overflow posts using Python, increasing precision by 11.1%.

May 2021 – Aug 2021  
Toronto, ON, Canada

## RESEARCH

Yizhou Huang, **Hamza Dugmag**, Timothy D. Barfoot, and Florian Shkurti, "Stochastic Planning for ASV Navigation Using Satellite Images", 2023 IEEE International Conference on Robotics and Automation (ICRA 2023) [paper] [website]

Jul 2023

**Hamza Dugmag**, Arjun Sridharkumar, Iftekhar Ahmed, and Shurui Zhou, "Analyzing Stack Overflow Community Posts to Automate Knowledge Organization", 2021 University of Toronto Undergraduate Engineering Day Conference (UnERD 2021)

Aug 2021

## EDUCATION

### BASc in Engineering Science (Major in Electrical and Computer Engineering),

Certificate in Engineering Business, University of Toronto (St. George)

Sep 2020 – Jun 2025  
Toronto, ON, Canada

- 3.96/4.00 cGPA, 92% average, Dean's Honours List in all semesters.
- Courses: Electronic Circuits, Semiconductor Physics, Electromagnetic Waves, Computer Organization, Systems Software, Systems Control, Energy Systems, Design and Ethics.

## PROJECTS

### University of Toronto Aerospace Team — Rocketry Division

#### Liquid Rocket Chief Engineer

- Led the design, analysis, fabrication, and testing of a liquid bipropellant rocket.
- Created the design requirements, concept of operations, and mass budget.

Jun 2022 – May 2023

#### Avionics Subsystem Lead

- Designed surge-protected relay circuits to control DC motors with a Raspberry Pi, increasing power rating by a factor of 20.
- Developed data acquisition methods to calibrate load cells and pressure transducers from a custom GUI with 95% accuracy.

Jun 2021 – May 2022

## Electric Guitar Pedals

Dec 2022 – Jan 2023

- Designed a guitar distortion pedal based on a common-emitter NPN Darlington pair.
- Built a guitar tremolo pedal with true bypass switching using a phase shift oscillator.
- Soldered the electronics and packaged the boards in custom 3D-printed enclosures.

## Multicycle Processor SIMD Extension, *ECE352 Computer Organization*

Nov 2022 – Dec 2022

- Designed the SIMD microarchitecture for a multicycle processor implemented in *Verilog*.
- Verified the data and control paths using *Quartus Prime* Netlist Viewers and *ModelSim*.

## AWARDS

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### (C\$4984) Christina and Logan Martin Scholarship in Engineering,

Aug 2023

*U of T Faculty of Applied Science and Engineering*

Awarded on the basis of academic merit.

### (C\$8942) Kenneth Carless Smith Award in Engineering Science,

Aug 2023

*U of T Faculty of Applied Science and Engineering*

Awarded by the chair on the basis of interest and aptitude in the area of electronics.

### (C\$2676) Peter Sands Award in Engineering Science,

Aug 2022

*U of T Faculty of Applied Science and Engineering*

Awarded by the chair on the basis of academic merit, qualities of character, leadership, and commitment to the engineering profession.

### (C\$6000) Undergraduate Student Research Award,

Mar 2022

*Natural Sciences and Engineering Research Council of Canada*

Awarded on the basis of academic merit and research potential.

### (C\$27000) Fessenden-Trott Scholarship, *Universities Canada*

Sep 2021

Selected among nominees across Ontario universities on the basis of academic merit, leadership, extracurricular involvement, and reference letters.

### (C\$5000) Dean's Summer Undergraduate Research Pivot Award,

Sep 2021

*U of T Faculty of Applied Science and Engineering*

Participated in the *Undergraduate Summer Research Program*.

### Amateur Radio Operator Certificate (Basic with Honours),

Jul 2021

*Innovation, Science, and Economic Development Canada*

VA3UFT call sign, 100% exam score.

### (C\$2000) May Court Education Award, *May Court Club of Oakville*

Jun 2020

### (C\$2000) Rotary Education Award, *Rotary Club of Oakville*

Jun 2020

Awarded on the basis of academic merit and community service.

### (C\$2000) Faculty of Applied Science and Engineering Award,

May 2020

*U of T Faculty of Applied Science and Engineering*

Awarded on the basis of academic merit.

### (C\$5000) Faculty of Applied Science and Engineering Admission Scholarship,

May 2020

*U of T Faculty of Applied Science and Engineering*

Awarded on the basis of academic merit and extracurricular involvement.