

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

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

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 development goals.

Aug 2021 – Apr 2022
Toronto, ON, Canada

Machine Learning Research Intern, U of T Forcolab Group

- Analyzed the potential of collaborative *Stack Overflow* posts to organize knowledge for improved search and learning experiences.
- Investigated code clone detection models to compare educational 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, PEY Co-op), 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

Jun 2022 – May 2023

- Coordinated the design, analysis, fabrication, and testing of a liquid bipropellant rocket.
- Created the design requirements, concept of operations, and mass budget.
- Organized a preliminary design review with advisors and communicated the project at onboarding sessions and team meetings.

Avionics Subsystem Lead <ul style="list-style-type: none"> Managed a team to integrate flight and ground systems for wireless communication, power, sensors, actuators, and user interfaces. Designed surge-protected relay circuits to control DC motors with a <i>Raspberry Pi</i>, increasing power rating by a factor of 20. Formalized data acquisition methods to calibrate load cells and pressure transducers from a custom GUI with 95% accuracy. 	Jun 2021 – May 2022
Electric Guitar Pedals <ul style="list-style-type: none"> 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. 	Dec 2022 – Jan 2023
Multicycle Processor SIMD Extension, ECE352 Computer Organization <ul style="list-style-type: none"> Designed the SIMD microarchitecture for a multicycle processor implemented in <i>Verilog</i>. Verified the data and control paths using <i>Quartus Prime</i> Netlist Viewers and <i>ModelSim</i>. 	Nov 2022 – Dec 2022
AWARDS	
(C\$4984) Christina and Logan Martin Scholarship in Engineering, <i>U of T Faculty of Applied Science and Engineering</i> Awarded on the basis of academic merit.	Aug 2023
(C\$8942) Kenneth Carless Smith Award in Engineering Science, <i>U of T Faculty of Applied Science and Engineering</i> Awarded by the chair on the basis of interest and aptitude in the area of electronics.	Aug 2023
(C\$2676) Peter Sands Award in Engineering Science, <i>U of T Faculty of Applied Science and Engineering</i> Awarded by the chair on the basis of academic merit, qualities of character, leadership, and commitment to the engineering profession.	Aug 2022
(C\$6000) Undergraduate Student Research Award, <i>Natural Sciences and Engineering Research Council of Canada</i> Awarded on the basis of academic merit and research potential.	Mar 2022
(C\$27000) Fessenden-Trott Scholarship, Universities Canada Selected among nominees across Ontario universities on the basis of academic merit, leadership, extracurricular involvement, and reference letters.	Sep 2021
(C\$5000) Dean's Summer Undergraduate Research Pivot Award, <i>U of T Faculty of Applied Science and Engineering</i> Participated in the <i>Undergraduate Summer Research Program</i> .	Sep 2021
Amateur Radio Operator Certificate (Basic with Honours), <i>Innovation, Science, and Economic Development Canada</i> VA3UFT call sign, 100% exam score.	Jul 2021
(C\$2000) May Court Education Award, May Court Club of Oakville	Jun 2020
(C\$2000) Rotary Education Award, Rotary Club of Oakville Awarded on the basis of academic merit and community service.	Jun 2020
(C\$2000) Faculty of Applied Science and Engineering Award, <i>U of T Faculty of Applied Science and Engineering</i> Awarded on the basis of academic merit.	May 2020
(C\$5000) Faculty of Applied Science and Engineering Admission Scholarship, <i>U of T Faculty of Applied Science and Engineering</i> Awarded on the basis of academic merit and extracurricular involvement.	May 2020