

Hamza Dugmag *Electrical and Computer Engineering Student*

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SKILLS

Electrical

Soldering, Oscilloscope, Power Supply, Logic Analyzer, RPi, Arduino, ModelSim, Verilog, Quartus Prime, LTspice, KiCad

Programming

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

Mechanical

SolidWorks, Fusion 360, 3D Printing, Power Tools, Laser Cutting, Woodworking

PROFESSIONAL EXPERIENCE

Robot Navigation Research Intern, UTIAS Autonomous Space Robotics Laboratory

May 2022 – Aug 2022
Mississauga, ON, Canada

- Generated water masks of Canadian lakes using geographic information systems and implemented a greedy search baseline in *Python* to evaluate our navigation algorithm.
- Developed a graphical user interface using *ROS* and *React JS* 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.

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

Aug 2021 – Apr 2022
Toronto, ON, Canada

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

Machine Learning Research Intern, U of T Forcolab Group

May 2021 – Aug 2021
Toronto, ON, Canada

- 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 *Pandas* and *Docker*, increasing precision by 11.1%.

EXTRACURRICULARS

University of Toronto Aerospace Team — Rocketry Division

Liquid Rocket Chief Engineer

Jun 2022 – present
Toronto, ON, Canada

- Led the design, analysis, fabrication, and testing of a liquid bipropellant rocket set to break the Canadian Amateur Rocketry Altitude Record.
- Created the design requirements, concept of operations, project timeline, and financial, power, and mass budgets.

Avionics Subsystem Lead

Jun 2021 – May 2022
Toronto, ON, Canada

- Debugged a strain gauge amplifier board using an oscilloscope (I2C trigger), *Arduino*, power supply, and digital multimeter.
- Developed data acquisition methods to calibrate load cells and pressure transducers with 95% accuracy.
- Designed surge-protected relay circuits to control DC motors with a *Raspberry Pi*, increasing power rating by a factor of 20.
- Integrated radio and GPS modules, buck and boost converters, LiPo batteries, servo motors, solenoid valves, local networks, and a custom C++ graphical user interface.

RESEARCH

Yizhou Huang, **Hamza Dugmag**, Timothy D. Barfoot, and Florian Shkurti, "Stochastic Planning for ASV Navigation Using Satellite Images", Submitted to *IEEE International Conference on Robotics and Automation (ICRA 2023)* [preprint] [📄](#) [video] [📺](#)

Aug 2022

Hamza Dugmag, Arjun Sridharkumar, Iftekhhar Ahmed, and Shurui Zhou, "Analyzing Stack Overflow Community Posts to Automate Knowledge Organization", Presented at *University of Toronto Undergraduate Engineering Days 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)**

- cGPA: 3.94/4.00 (90% average), Dean's Honours List in all semesters.
- Relevant courses: Electronics, Computer Organization, Electromagnetism, Signal Analysis, Data Structures and Algorithms, Engineering Ethics and Design I/II/III.

Sep 2020 – Apr 2025
Toronto, ON, Canada

PROJECTS

Adjustable Power Supply

Jul 2022 – Sep 2022

- Designed an adjustable power supply based on the LM317 using *KiCad* and soldering.
- Created a voltage indicator circuit using LEDs, an LM339 with a Schmitt trigger, and a voltage divider.
- Implemented safety features including fuses, inrush current limiters, Schottky diodes, heatsinks, standoffs, and a 3D printed enclosure.
- Documented the design requirements, schematics, and bill of materials.

Various Digital Circuits, Engineering Science — ECE253 Digital and Computer Systems

Sep 2021 – Nov 2021

- Designed a 4-bit restoring divider, rate divider, and other digital circuits using *Verilog*, FPGAs, and 7400-series integrated circuits.
- Debugged and validated circuits using a TTL logic probe and *ModelSim* simulations.

AWARDS

(C\$2676) Peter Sands Award in Engineering Science,
U of T Faculty of Applied Science and Engineering

Aug 2022

(C\$9000) NSERC Undergraduate Student Research Award,
Natural Sciences and Engineering Research Council

Mar 2022

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

Sep 2021

Selected among nominees from every Ontario university on the basis of academic merit and extracurricular involvement.

(C\$5000) Dean's Summer Undergraduate Research Pivot Award,
U of T Faculty of Applied Science and Engineering
Participated in the *Undergraduate Summer Research Program*.

Sep 2021

Amateur Radio Operator Certificate (Basic with Honours),
Innovation, Science, and Economic Development Canada
VA3UFT call sign, 100% exam score.

Jul 2021

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

Jun 2020

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

Jun 2020

(C\$7000) Faculty of Applied Science and Engineering Awards,
U of T Faculty of Applied Science and Engineering

May 2020