Hamza Dugmag *Electrical and Computer Engineering Student*

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SKILLS

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

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

Mechanical
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%.

PROJECTS

University of Toronto Aerospace Team — Rocketry Division

Liquid Rocket Chief Engineer — Jun 2022 – present
- Led the design, analysis, fabrication, and testing of a liquid bipropellant rocket.
- Created the design requirements, concept of operations, and mass budget.

Avionics Subsystem Lead — Jun 2021 – May 2022
- 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.

Electric Guitar Fuzz Pedal — Dec 2022
- Designed a guitar distortion pedal based on a common-emitter NPN Darlington pair.
- Soldered the electronics and packaged the board in a custom 3D-printed enclosure.

Multicycle Processor SIMD Extension, *ECE352 Computer Organization* — Nov 2022 – Dec 2022
- Designed a vector extension for a multicycle processor implemented in *Verilog*.
- Verified the data and control paths using *Quartus Prime* Netlist Viewers and *ModelSim*.

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, Iftekhar 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), Sep 2020 – Apr 2025
Certificate in Engineering Business, *University of Toronto (St. George)* Toronto, ON, Canada

- cGPA: 3.95/4.00 (91% average), Dean's Honours List in all semesters.
- Relevant courses: Electronics, Computer Organization, Electromagnetism, Signal Analysis and Communication, Control Theory, Energy Systems, Engineering Design and Ethics.

AWARDS

(C$2676) Peter Sands Award in Engineering Science, Aug 2022
U of T Faculty of Applied Science and Engineering

(C$9000) NSERC Undergraduate Student Research Award, Mar 2022
Natural Sciences and Engineering Research Council

(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, 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) 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, May 2020
U of T Faculty of Applied Science and Engineering