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

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

PROFESSIONAL EXPERIENCE

Robot Navigation Research Intern, *UTIAS Autonomous Space Robotics Lab*
May 2022 – present
Mississauga, ON, Canada

- Developed a graphical user interface using *ROS* and *React JS* to track a *Clearpath Heron* unmanned surface vehicle (USV) and visualize its navigation policy.
- Generated water masks of numerous Canadian lakes using geographic information systems, *Python*, and *Earth Engine* to evaluate the policy planner against greedy baselines.
- Conducted field tests in lakes to validate USV 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 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%.
- Presented "*Analyzing Stack Overflow Community Posts to Automate Knowledge Organization*" at the 2021 *U of T UnERD Conference*.

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.

EDUCATION

BASc in Engineering Science (Major in Electrical and Computer Engineering), Certificate in Engineering Business, *University of Toronto (St. George)*
Sep 2020 – Apr 2025
Toronto, ON, Canada

- cGPA: 3.94/4.00 (90%), 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.

PROJECTS

Dual Channel Adjustable Power Supply Jul 2022 – present

- Designed an adjustable power supply based on the LM317 using KiCad and soldering.
- Created a voltage indicator circuit using LEDs, an LM339, and a voltage divider.
- Implemented safety features including fuses, inrush current limiters, 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$9000) NSERC Undergraduate Student Research Award, Mar 2022
Natural Sciences and Engineering Research Council

(C$9000) 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