Hamza Dugmag *Electrical and Computer Engineering Student*

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SKILLS

Programming
MATLAB, Python (NumPy, Pandas, SciPy, PyTorch), C/C++, Git, Docker, ROS

Electrical
RPi, Arduino, Verilog, Quartus Prime, Assembly, LTspice, Soldering, KiCad

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

Other
LaTeX, Unreal Engine, Photography, Adobe Illustrator, MS Excel

PROFESSIONAL EXPERIENCE

Robot Navigation Research Intern, *U of T 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 and *Earth Engine* to evaluate the policy planner.
- Conducted field tests in lakes to validate USV mapping, localization, and navigation.
- Co-supervised by Prof. Tim Barfoot (*UTIAS*) and Prof. Florian Shkurti (*CS*).

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

- Replicated 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%.
- Presented "*Analyzing Stack Overflow Community Posts to Automate Knowledge Organization*" at the 2021 *U of T UnERD Conference*.
- Co-supervised by Prof. Shurui Zhou (*ECE*) and Prof. Iftekhar Ahmed (*UCI*).

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.

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

- 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, servo motors, solenoid valves, local networks, and a custom graphical user interface.
- Represented the Rocketry Division in an interview for *UTAT*'s recruitment and sponsorships video.

PROJECTS

Maintaining Vaccine Temperatures, *Engineering Science — Praxis III* — Jan 2022 – Apr 2022

- Co-authored a design proposal, project management plan, verification plan, financial budget, and bill of materials.
- Prototyped a thermochemically cooled container using *Fusion 360*, 3D printing, and a *Raspberry Pi*.

Modelling a Vibrating Building, *MathWorks MATLAB Summer Hackathon* — Jul 2021

- Implemented systems of differential equations in *Simulink* to simulate free vibrations.
- Calculated resonant frequencies in *Microsoft Excel*.
- Received the "*Best Use of Simulink*" award.

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*.

Second Degree Black Belt, *World Taekwondo — Kukkiwon* — Aug 2021
International athlete and coach with 7 years of experience.

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

First Degree Black Belt, *World Taekwondo — Kukkiwon* — Dec 2019

Humanitarian Service Project Silver Medal, *Muslim Interscholastic Tournament* — Mar 2019
Executed a fundraiser campaign with *Islamic Relief USA* for East Africa's water and sanitation crisis.