# Hamza Dugmag *Electrical and Computer Engineering Student*

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## SKILLS

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

**Electrical**
*Raspberry Pi, Arduino, Quartus Prime, LTspice, Altium Designer, Soldering*

**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 GUI using *ROS* and *React JS* to track a *Clearpath Heron* unmanned surface vehicle (USV) and visualize its navigation policy.
- 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 guided engineering academic review sessions (GEARS) every week 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 BERT models using *PyTorch* to detect type-III code clones.
- 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*" at the 2021 *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),**
*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.
- Minor in Robotics and Mechatronics and Certificate in Engineering Business.
- Relevant courses: Electric Circuits, Digital and Computer Systems, Electromagnetism, Data Structures and Algorithms, Engineering Design I/II/III, Engineering Ethics.

## 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 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 for DC motors controlled by a *Raspberry Pi*, increasing power rating by 54%.
- Integrated radio and GPS modules, power electronics, servo motors, solenoid valves, local networks, and a custom 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, and financial budget.
- Prototyped a thermochemically-cooled box using *Fusion 360* and 3D printing.
- Programmed a temperature controller with a *Raspberry Pi* using *Python*.

**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 Winner,** *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*

**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.