Zuha Mujib

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EDUCATION

University of Toronto **Toronto, ON**

Bachelor of Applied Science and Engineering -Electrical Engineering + PEY (+Business certificate) *Sept. 2022 - April 2027 (expected)*

SKILLS

Technical skills: Microsoft Office, Github, Circuits (KiCad, ModelSim, LtSpice), FPGA, Quartus, Linux, Soldering, Docker, VHDL

Programming Languages: C/C++, Verilog, Assembly (Nios II), Python, MATLAB, HTML, CSS

Core Competencies: Strong Communication, Collaboration, Problem Solving, Attention to detail, Time Management

RELEVANT EXPERIENCES

Autonomous Rover Team- Embedded Systems Member **Toronto, ON**

University of Toronto Robotics Association- University of Toronto *Sept. 2023 - Present*

- Created circuit schematics in **KiCad**, integrating the control, power, wheel motor controls and main laptop circuits by the use of different design components like **optocouplers, relay switches, transistors, diodes, buck converters** etc,.
- Assisted in **SSH-ing** into the raspberry-pi from the rover's main laptop, for the purpose of merging embedded system code with ROS and CV automation algorithms.
- Tested motor controllers using **Arduino** and **LED circuit**, testing the conversion from **0-130 pwm** input to wheel's **rotational velocity.**

Programming Director- UTEK 2025 **Toronto, ON**

University of Toronto Engineering Kompetition- University of Toronto *July. 2024 - Present*

- **Led five** brainstorming sessions with the co-director to design an algorithmic challenge for over **50 participants** for the upcoming competition and coordinated with the executive UTEK team in **decision-making** for the UTEK-2025 theme.
- Drafted Programming and Judges Packages, providing **clear guidelines**, **evaluation criteria**, and a **rubric** to ensure accurate assessment and selection of the **top team** for **OEC 2025**.

PROJECTS

BasketBlitz **Toronto, ON**

University of Toronto *Jan. 2024- April 2024*

- Developed a **two-player** basketball game in **C** for the **DE1-SoC board**, featuring a **timer**, **PS2 keyboard** input, and **VGA**.
- Achieved **40%** faster animations with **double buffering** and ensured **real-time** controls through PS2 keyboard **interrupts** and hardware timer synchronization.

Mapping GIS **Toronto, ON**

University of Toronto Jan. 2024 - April 2024

- Developed a **GIS** for city mapping with **StreetsDatabaseAPI and OSMDatabaseAPI**, featuring an interactive **C++** interface (**ezgl, GTK, Glade**) with customizable colors, **audio navigation** for people with **visual impairments**, and **<1s load times**.
- Implemented **Dijkstra's** for shortest paths and designed a **TSP solution** using multi-Dijkstra's, achieving **70%** similarity to the optimal path with a **1.2%** performance boost through **perturbations**. Successfully **debugged** the implemented algorithms.

QuizBlitz **Toronto, ON**

University of Toronto *Nov. 2024- Dec. 2024*

- Developed a math quiz game in **Verilog** on an **FPGA** with **keyboard** input and **VGA display** for an interactive experience.
- Applied principles of **Register Transfer Level (RTL)** and simulated and tested signal **timing** and **digital logic per clock cycle** in **ModelSim**, verified **real-time** keyboard input, and stored pixel backgrounds using memory **ROM** for VGA rendering.

ACHIEVEMENTS

Runners-Up Programming Competition -UTEK 2023 **Toronto, ON**

University of Toronto *Nov 11-12, 2023*

- Created **3 Python** algorithms in under **7 hours** during a competition; a recursive **solution** to find the shortest path between **graph** nodes, used a **dictionary** to account for cost and tuples to extend with time, ranked among the top-2 fastest algorithm.