

Liviru Abey

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Technical Skills

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|-----------------------|------------|------------------|---------------------------|
| • C,C++, Git | • FlexPDE | • MATLAB/Julia/R | • Granta EduPack |
| • Python (OOP) | • Multisim | • Lathe, Milling | • SolidWorks/Inventor/FEA |
| • HTML/CSS/Javascript | • Maple | • 3D-Printing | • Circuitry Analysis |

Education

BEng. Mechatronics Engineering and Management (Co-op)

Sep. 2021 - Present

Faculty of Engineering, McMaster University, Hamilton, Ontario.

- GPA – **3.7** on a 4.0 scale | A **Mechanical Member** of the **McMaster Mars Rover team** and **RoboMasters**

Experience

Mechanical Engineering Team Member

Jan. 2022 - Present

McMaster Mars Rover Team, Hamilton, Ontario

- Designed and analyzed rover wheel side plates using **SolidWorks**, gaining expertise in **3D modeling** and **FEA**.
- Produced rover components with **tolerances up to 0.0001 in.** using advanced precision machinery, showcasing expertise in **lathe, milling, cutting, and drilling**.
- Analyzed the auger of the rover using force analysis with **Maple** and **FlexPDE** with a **safety factor above 2**.
- **Co-led** a team of 3 and won **1st place** in creating "The Faraday Rover V1.5" science module for the **Canadian International Rover Competition 2023**, showcasing strong **teamwork and technical skills**.

Private Tutor/ Teaching Assistant

Jan. 2019 – Jun. 2019

Peel District School Board, Mississauga, ON

- Assisted students who were academically struggling with **mathematical** courses using software such **MATLAB** in order to **increase their grade up by 40%** from their original grade.

Projects

Pacemaker DCM (GUI)

3K04 Course - McMaster University

- Developed a user-friendly **API** which would receive data from pacemaker users and emit appropriate electrogram data using **Python's Tkinter** with the incorporation of the **PySerial** module for **serial communication** between the DCM and a **FRDM K64** board (pacemaker and heart).
- Practiced **modularization and hardware/information hiding** for better maintainability and implemented a robust **JSON** database reducing data **retrieval time by 40%** and increased overall system **performance by 25%**.

Intersection Design

2PX3 Course - McMaster University

- Stimulated an intersection using **Python OOP** in order to optimize an intersection containing vehicles and pedestrians with safer interactions compared to usual intersections using **V2X** communication.
- Factors such as **crashes with a probability of 10%** as well as **CO2 emission calculations** were included within the simulation using thorough research about present intersections in order to simulate a more realistic model.

Digital Student Number Display

2E03 Course - McMaster University

- Designed a **digital circuit** displaying my student number on a **7SD** at a desired frequency using **Multisim software**.
- Gained knowledge about **sequential logic** and **J-K flip flops'** role in creating desired sequences using truth tables and **K-mapping** and built the final product using **5 J-K flip flops, 4 IC chips (10 AND gates, 4 OR gates)** in total.
- Gained rigorous experience in using various components including **breadboards, 7SD decoders, logic analyzers, oscilloscopes, and AC/DC power supplies**.

Robotic Arm

1P13 Course - McMaster University

- Using a **Raspberry Pi**, generated a **Python**-based robotic arm control system, demonstrating expertise in **OOP** while utilizing sensor inputs of the user's body for task automation improving multi-task operations.
- Utilized **Quanser interactive labs** to stimulate the software while managing system uncertainties, enhancing the understanding of real-world operational challenges.