Alexander Apostolu

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Education

University of Toronto

Honours in Bachelors of Science, Computer Science and Mathematics + PEY Co-op *Sep. 2022 – June 2027*

Courses: Software Design (Java), Systems Programming (**C**, **Bash**, and **Linux**), Data Structures and Analysis, Computer Organization (Assembly), Theory of Computation

Technical Skills

Languages: C/C++, Python
Hardware: Arduino, STM32
Developer Tools: Make, CMake, GoogleTest, Git, Github, VS Code, Visual Studio, Docker

Experience

Firmware Engineer May 2024 – Present

U of T Space Systems Design Team

- Created and verified project requirements for the house keeping functionality for our upcoming CubeSat, developed on the **STM32 Microcontroller** in **C**.
- Created a comprehensive test plan with my team using test-driven development methodology. Wrote detailed test conditions and expected outcomes in plain English for every function as the initial step.
- Implementing connection handlers from the payload and power systems to the onboard computer.

Technical Developer Oct. 2023 – May 2024

Robotics Club

- Collaboratively developed **Arduino tutorials** for the IEEE branch at U of T, showcasing various sensors and their usage including a temperature and distance sensor.
- Led the development of a visually appealing website employing React and utilizing **Git** for version control.
- Demonstrated proactive initiative by delivering the website **ahead of schedule**, integrating an email feature to accommodate user inquiries, garnering positive feedback during club review and **publicly deployed** for our 200+ general members.

Projects

Programming Language | Github

- Created a bytecode interpreted programming language using **C++**, **CMake**, and **Visual Studio**, leveraging **Git** and Github for version control.
- Overcame significant hurdles in mastering data structures, **C++** programming paradigms, and language design intricacies during the development process. Through persistent effort, collaboration, and self-education, delivered a stable version with streamlined installation procedures.
- Designed and developed a front end website to effectively showcase the language's capabilities and features to potential users.

Fluid Simulation | Github

- Developed a 2D fluid simulation from scratch using **C++**, OpenGL, and CUDA within a challenging 36-hour hackathon time frame. Used the Navier-Stokes mathematical equations to model the fluid, and allowed customization of various parameters, allowing users to change the viscosity or force of the fluid.
- Contributed collaboratively within a team of four, leveraging and expanding my proficiency in **C++**, integrating concepts learned from academic papers, and proficiently utilizing **Git** for seamless version control and teamwork coordination. Successfully delivered a functional simulation well within the project deadline.

Text to Braille Glove | Linkedin Post

- Developed a haptic glove prototype leveraging AI text recognition and **Arduino components** to translate text into braille for visually impaired individuals, enhancing accessibility in noisy environments.
- Used OpenCV and EasyOCR in **Python** for text recognition via webcam, and programmed an **Arduino Uno** to control six servo motors mimicking Braille characters' vibrations, resulting in a haptic glove.
- Facilitated project coordination, contributed to software development, and meticulously assembled hardware components, showcasing a **multidisciplinary approach** to achieving a tangible solution for **societal impact**.