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/Libraries: C/C++, Python, ROS

Developer Tools: Make, CMake, GoogleTest, Git, GitHub, VS Code, Visual Studio, Docker, Arduino, Linux

Experience

Driverless Developer April 2024 – Present

U of T Formula Racing (FSAE) Design Team

- Implemented key functionalities of the **FastSLAM algorithm** in **C++**, for car localization. Implemented point initialization and weight assignment by mastering the existing **C++** and **ROS** code base and using **Docker** for streamlined builds.
- Collaborated with teammates through code reviews and used **Git** for seamless version control. Proficient in **continuous integration** practices using **GitHub Actions** for integrating my contributions and adeptly crafted unit tests using **GoogleTest**.

Technical Developer Oct. 2023 – Present

University of Toronto 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, HTML, and CSS, 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++** and **CMake**, 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 implemented a website utilizing JavaScript, HTML, and CSS to effectively showcase the language's capabilities and features to potential users.

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 in a team of 3, contributed to software development, and meticulously assembled hardware components, showcasing a **multidisciplinary approach** to achieving a tangible solution for **societal impact**.

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 4, 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.