Finn Cullen

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Education

- **University of Waterloo** — Waterloo, ON, Canada
  Bachelors of Software Engineering — *Sept. 2024 – Present*
- **Glenlyon Norfolk High School (International Baccalaureate Program)** — Victoria, BC, Canada
  100% average in STEM subjects - Final Grade: 38 IB — *Sept. 2020 – July. 2024*

Skills

- **Languages**: C#, Python, JS, CSS, C++, C, Assembly
- **Technologies/Frameworks**: React, Git, Unity, Docker, HTML, Latex, SolidWorks, Bash, Linux
- **Other Skills**: Circuit Design, 3D Modeling, Soldering, Breadboarding, Engineering Schematic Creation

Projects

- **Debug Debacle**: Multiplayer online competitive coding website, where users compete to correct bugs in code fastest. Built for MCHacks 2025, winning 3rd place. Uses React for front-end, Flask for back-end. My work focused on automatically generating unique problem sets and test cases for each game instance, as well as validating them, through generative AI workflows created using Gumloops API and Web-hooks
- **FATChess**: Chess engine and AI created without external chess libraries. Written in C# with Unity for UI. AI uses Min-Max search with alpha-beta pruning. Learned about game-dev, AI development, and front end design
- **PathMaxer**: Tour guide robot which takes a schedule uploaded from a Bluetooth integrated smartphone app and autonomously leads users between their classes on campus. Coded using Robot OS, Raspberry Pi, C/C++, React Native, Expo. Uses Dijkstra's algorithm for path finding and image processing for object avoidance
- **3D Graphics Engine**: Python based 3D graphics environment. Features OBJ file support and real-time quaternion-based camera movement. Graphics algorithms uses projection matrices with hidden face occlusion and dithered shading
- **6502 Breadboard Computer**: Programmed in x86 assembly language (and some in binary) for text input and numerical calculations,. Learned to write low-level machine code. Designed and wired on breadboards from base chips
- **Omni-Directional Rover**: Robot controllable wirelessly through a web server. Using ESP32 and 3D printed self assembled Mecanum wheels. Interacts dynamically with onboard LED display. Developed at Microbots Hackathon 2024

Relevant Experience

- **University of Waterloo Orbital** — Waterloo, ON, Canada
  Firmware Team Member — *Sept 2024 - Present*
  - Implemented Doppler effect correction algorithms for ground station to satellite communications
  - Back-end work using Python and FastAPI, and firmware programing, learning RTOS and HIL concepts
- **MiNa Labs - Engineering and Computer Science - University of Victoria** — Victoria, BC, Canada
  Research Assistant — *July 2023 - Sept 2023*
  - Microfluidics and nanotechnology engineering lab led by Dr. Mina Hoorfar, Dean of Engineering
  - Designed and deployed hardware and software systems to improve lab efficiency and safety
  - Gained experience in SolidWorks and Fritzing for CAD and producing physical components and circuits
- **Horner Foundation** — Victoria, BC, Canada
  Junior Grant Maker — *2020 - July 2024*
  - Leader of the Youth Grant Making Committee at the Horner Foundation, not-for-profit.
  - Made grant allocation decisions, reviewed grant applications to ensure proper allocation of funding, organized and led committee meetings, and formally presented results to the board

Other Achievements

- **Hackathons**: 2nd place at UTRA Hacks 2025 (150+ teams), 3rd place at MCHacks 2025 (200+ teams)
- **CanHack**: Team leader for CanHack CTF coding competition team. Led team in solves and mentored new students
- **Waterloo Math Competitions**: Certificates of distinction earned for all competitions since 2018