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**: HTML, React, Latex, Git, Unity, SolidWorks, Docker, Bash, Linux
- **Other Skills**: Soldering, 3D Modeling, Circuit Design, Breadboarding, Engineering Schematic Creation

Projects

- **UW Orbital**: Implemented doppler effect correction algorithms for sattelite communications. Ground station back-end using python and FastAPI, as well as programming satellite firmware, learning RTOS software design and HIL concepts
- **FATChess**: Chess engine and AI created entirely without external 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
- **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 frontend, Flask for backend. 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 webhooks
- **PathMaxer**: Tour guide robot which takes a schedule uploaded from an bluetooth integrated smartphone app and autonomously lead 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 webserver. Using ESP32 and 3D printed self assembled Mecanum wheels. Interacts dynamically with onboard LED display. Developed at Microbots Hackathon 2024

Relevant Experience

- **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 using SolidWorks and Fritzing for CAD and schematic design to produce physical components and circuits to deploy code on
  - Working independently and managing multiple projects simultaneously to meet delivery deadlines.
- **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 multi-thousand dollar grant allocation decisions, reviewed grants to ensure proper allocation of funding, organised meetings of members, 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