Sirius Hou

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Education

University of Waterloo - Candidate for Bachelor of **Computer Science**, **AI Specialization** *2021 ~ 2026*

Cumulative GPA: **87%** & **Term Distinction Honour** x 6

Skills

Programming languages: C++, C#, C, Python, Kotlin, TypeScript, JavaScript (Node & React), HTML, CSS, Java, Markdown, MIPS

Tools: Unreal Engine, Unity, MATLAB, Android Studio, Git, Jira, Google Test, Figma, LaTeX, Linux, Windows, ChatGPT, MS Office Suite

Experience

Christie Digital Systems Innovations ULC - *Application Software Developer (C++)* *Sep 2024 ~ Present*

- Developed a **black level correction algorithm** with **MATLAB** to address brightness and color inconsistencies in laser projectors; Integrated into Hawkeye calibration software using **C++** and **Qt framework**, improving the color accuracy by over **50%**.
- Enhanced Hawkeye's **web UI** using **JavaScript** to add dynamic control sliders for real-time RGB adjustments, streamlined the calibration process and significantly improved user experience. (client commented "intuitive and convenient to use")

Ford Company of Canada Limited - *Software Developer (Data Collection Platform)* *Jan 2024 ~ Apr 2024*

- Maintained codebase for **FNV4 Data Collection Platform** using **C++**, improved integration with real-time signal processing systems.
- Developed a **multi-threaded** data ingestion service that optimized data flow from vehicle sensors, reduced processing latency by **23%**.
- Built a robust testing framework using **Google Test** and **Google Mock**, covering over **90%** of the platform's core modules and ensuring stability during the transition from FNV3 to FNV4 architectures.

Behaviour Interactive Inc. - *Software Engineer (Unreal Engine Tool Dev)* *May 2023 ~ Aug 2023*

- Developed **Unreal Engine** components using **C++** for real-time, in-editor actor **collision detection** with customizable visual indicators, allowing designers to visualize collisions without launching the game, streamlined level design and boosted team productivity by **~40%**.
- Optimized a custom **Unreal Engine plugin (Tile Editor)** to automate the conversion of over **700** game scene tiles from blueprints to levels, supporting advanced foliage editing, saving over **100** hours of manual work and boosting design team efficiency by **~30%**.

University of Waterloo - *Instructional Support Assistant* *Aug 2022 ~ Dec 2022*

- Performed **UI** and **API quality assurance tests** for the Android SES application, identifying and reporting bugs for timely resolution.
- Constructed **C++** configuration scripts for the auto-grading system (**Lint R**) to automated assignment assessments and feedback.
- Conducted weekly office hours, tutorials, and pre-exam review sessions. (Praised by students as "**encouraging** and **supportive**.")

Projects

UW – Research Assistant (HCI – Around Ear Gestures for VR Locomotion) *Present*

- Collaborated with Prof. **Jian Zhao** to design and implement a **VR** game in **Unity** with mazes and interactable objects to test **around-ear bare-hand gestures** for VR locomotion, improving accessibility for seated and lower-limb disabled users.
- Programmed game mechanics and interaction logic in **C#**, enabling seamless simultaneous locomotion and object manipulation, leading to a ~**30%** increase in task completion efficiency compared to traditional controller-based methods.

Collaborative Whiteboard Android App (YADA) *2023*

- Used **Kotlin** and **Jetpack Compose** in **Android Studio** to design and build a responsive **Android whiteboard App** in a team of 4, supporting **real-time**, **low-latency** collaboration, allowing multiple users to draw and interact on the whiteboard simultaneously.
- Implemented dynamic drawing features including pen, eraser, and shape tools with **undo/redo** functionality and **real-time rendering**.

The Game of ChamberCrawler3000+ (CC3K+) *2023*

- Built the game in **C++** with **OOP**, leveraged **smart pointers** and **STL** for efficient memory management and dynamic gameplay logic.
- Enhanced gameplay interaction by implementing **Observer** and **Decorator Design Patterns**, adding key features such as NPC combat, potion usage, merchant trading, and prop equipping.
- Elevated the gaming and visual experience by implementing a series of "cheat codes" via **C++ macros** and a **colored text display UI**.

UW Course Scheduler (UWCS) *2022*

- Developed a smart scheduling agent for UW students using **Python**, leveraging **Selenium** and **Requests** to extract real-time class data and **BeautifulSoup** for analysis; Adopted by **20+** users with **50+** successfully generated schedules.
- Combined a conflict-free scheduling algorithm with **OpenAI GPT-3.5 API** integration for personalized schedule generation, supporting **real-time editing** and **GUI calendar display**, which significantly improved user experience and simplified course selection process.

WLP4 (Simplified C Language) Compiler Project *2022*

- Programmed a full-featured compiler for WLP4 using **C++** and a **simplified Maximal Munch algorithm** for **lexical analysis**.
- Implemented advanced features such as nested procedures and closures while conducting **context-sensitive semantic analysis**.
- Enhanced runtime performance via **in-line procedure substitution** and **constant folder** and **propagation** optimizations.

Awards

- University of Waterloo Computer Science International Student Upper-Year Scholarship, 2023
- University of Waterloo President's Scholarship, 2021
- Canadian Computer Competition (*CCC*): ***TOP 25%***, senior division, 2020 & ***TOP 25%***, junior division, 2019
- *Design Award & Amaze Award & Create Award,* 2019 & 2020 VEX EDR Robotics Championships