Joey Lu

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Technical Tools

Languages: Python, Java, C, C++, C#, HTML/CSS, JavaScript, SQL, Flutter/Dart, Functional Programming
Developer Tools: PyTest, AWS, VS Code, Xcode, Android Studio, Git, GitHub, Figma, PowerShell, NumPy
Libraries/Framework: React, FastAPI, Linux/Unix, Node.js, PyTorch

Experience

Waterloo Aerial Robotics   **November 2024 – Present**
Autonomy Software Developer   *Waterloo, ON*

- Developed **modular camera configuration classes** for **OpenCV** and **PiCamera** using Python, and updated base-camera settings enhancing flexibility and scalability in the camera factory's initialization process
- Expanded **test coverage**, using **PyTest**, with dedicated cases for camera creation, **OpenCV**, and **PiCamera** configurations, increasing reliability and stability and eliminating **100%** configuration-related issues
- Utilized Github version control for a large, multi-module codebase, integrating updates seamlessly with code reviews

SoarToWorld   **December 2023 – March 2024**
Web Developer Intern   *Richmond Hill, ON*

- Assisted in development of front-end websites using **React** and **CSS** adhering to customer demanded UI features
- Ensured the quality of **50+ screens** through extensive testing and debugging, leading to higher customer satisfaction
- Worked effectively within to **successfully deliver products on time**, increasing organizational efficiency

City of Vaughan   **March 2023 – June 2023**
Swim Instructor   *Vaughan, ON*

- Taught various levels with **positivity and active involvement**, achieving **100% positive feedback**
- Provided consistent, **clear verbal and written feedback** consistently to **~30 students**, leading to high skill mastery
- Followed class plans, ensuring all objectives were **met on time**, leading to consistent student progress

Projects

Visualise It | *Python, PyTorch, OpenCV, HuggingFace, NumPy*

- Developed a Python-based real-time design **visualization tool**, winning Best Mayor's Innovation Challenge at **QHacks**
- Implemented seamless object detection, segmentation, and motion tracking for dynamic and realistic **AR visualization**
- Built a **dynamic masking** system using pose landmarks, segmentation, and contour detection to isolate specific regions for overlay application, leveraging **homography** to ensure accurate alignment and natural blending in real-time.

ProteccAPI | *Node,js, React, CSS*

- Built an **NPM package and VSCode extension** to detect and manage sensitive API keys, automate .gitignore and .env creation, and deliver advanced security insights through code analysis, with over **100 downloads** for **UofTHacks.**
- Integrated **Git pre-commit hooks** with Husky to prevent **accidental commits** with sensitive API keys
- Thoroughly **analyzes Node modules and packages** to identify suspicious lifecycle scripts and typosquatting, perform npm audits, and uncover vulnerabilities, ensuring robust security

SoundVeil | *JavaScript, HTML, CSS*

- Developed an application that hides data in the **least significant bits of audio**, differences too subtle for the human ear, and enables **encryption and decryption** using the Vigenère cipher, created for **YRHACKS**
- Created a user-friendly interface with HTML/CSS and JavaScript for **functionality and data-hiding process**

Stubook | *Flutter, Dart*

- Designed a **cross-platform iOS/Android app** to simplify daily study routines, featuring a to-do list, calendar, and grades calculator/storage for efficient organization and tracking of tasks, with **~100 downloads and 5 stars rating**
- Built **clean and responsive layouts** that adapt to various devices, ensuring accessibility for all

Honours and Awards

Canadian Senior Mathematics Competition: Rank 129/12305 (Top 1%), Group IV Honour Roll
Canadian Computing Competition: Rank 352/3948 (Top 9%), Award of Distinction
Euclid Math Competition: Rank 1518/27650 (Top 6%), Award of Distinction

Education

University of Waterloo   **Sep. 2024 – Present**
Bachelor of Computer Science   *Waterloo, ON*

- **Awards:** Randall J. Howard & President's Distinction Scholarships ($10,000 Total)
- **Coursework:** Algorithm Design, Functional Programming, Software Dev Tools, Linear Algebra, Calculus, Algebra