Peter Zhang
Software Engineer

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Work Experience

QNX
Software Developer in Test

JAN 2025 – APR 2025
Ottawa, ON

- Performed **release testing** for Raspberry Pi 4; ran **37 manual tests** and performed data collection and summarization.
- Designed and implemented an Image Codec automation job (*in Jenkins*) consisting of **143 integration & unit tests** using **Shellscript** and **Python** (*pytest*) on all 4 QNX operating system versions – automated **572** total tests in 2 weeks in **Linux**.
- Demonstrated using python and **pytest** for *ssh'ing* into physics/local targets to 7 fellow test team members.
- Wrote **Dockerfile** specification to replicate test environment conditions for consistent integration and unit test results.
- Developed an internal test results parsing automation in python and **flask** for simple test result visualization.
- Currently working on **automating 30%** of **smoke, regression,** and **unit** tests using *pytest* in Python and bash**.**

Blackberry
Software Developer

MAY 2024 – AUG 2024
Waterloo, ON

- Collaborated in daily **scrum** standups and **sprint retrospectives** and wrote docs for development environment setup.
- Performed *manual development tasks* by merging SVN commits from a legacy framework to a modernized UI framework by **debugging**, **refactoring**, and **conducting lab-based tests** and verification of feature functionality of the application.
- Developed a "Batch Request" in **Typescript** and **Java** following an **MVC** design pattern to dynamically cache frontend interactions (cryptographic key generation, system logs, etc.) into a **PostgreSQL** database — leveraging cryptographic design principles acquired through an internal course.

Projects

Daily Vibez – cuHacking Submission
react, nextjs, python, FastAPI, Raspberry Pi, QNX, Gemini API

MAR 2025

- Designed and built an **AI assisted automated video capture system** and **video search engine** in under **36 hours**.
- Used a Raspberry Pi 4B, camera and microphone to capture video and audio + Gemini API to generate context
- Built a **custom video context caching system** to increase video search engine speed by **300%** and a custom backend server hosted on the RPI4 using **fastapi**.
- cuHacking submission for the 2nd Carleton hosted hackathon. Generates a daily vlog – a representation of the daily vibe.

StateMachine Developer Assistant
react, nextjs, python, flask, firebase, ReactFlow, MonacoEditor

MAR 2025

- Engineered a dynamic web application using **React and Next.js**, developing a **node-based** state machine editor canvas with **custom node data structures** using ReactFlow, and a built-in **code editor** for easy code editing with *Monaco Editor*.
- Integrated **Python AST** parsing in **Flask** backend to automate *node code generation*, cutting manual coding time by **70%**.
- Implemented **Firebase Authentication** and **Cloud Firestore** to secure user logins and enable real-time project storage.

SoraGL – Python Game Development Framework
python, moderngl, pygame, numpy, OpenGL, pybox2d

JAN 2025 – CURRENT

- Built a fully functional **Python** Game Dev Framework with rendering backed by **OpenGL** and **pygame,** fully customized **rendering pipeline;** following the **Entity Component** design pattern.
- Improved base engine performance by **20%** by using dynamic caching techniques (*200 entities, 60fps, M2 mac*)
- Used **pybox2d** to make a fully functional physics engine to simulate entity-to-entity interaction at 60fps.
- Currently implementing **Bounding Volume Hierarchy (BVH)** to increase performance cap in new **Raytracing** mode.

Education

The University of Waterloo

BASc in Computer Engineering

SEPT 2023 – Present
Waterloo, ON

Keywords

C/C++, Python, Java, Javascript, Typescript, C#, SQL, HTML, CSS, Bash, Ruby, RiscV
ReactJS, Next.JS, Flask, REST APIs, Django, Docker, Kubernetes, ThreeJS, NodeJS, Spring Boot, JPA, Numpy, Spring Boot
Postman, Google OAuth2, LangChain, pytest, Jira, Subversion, Github, Vercel, AWS, Ollama, Firebase, Figma, Canva, Cursor