Matthews Ma

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Education

University of Waterloo   Waterloo, Ontario
Software Engineering, Honours, Co-op (BSE 2021-2026)
- Mathematics Endowment Fund: Fall 2022 Executive Director & Fall 2023 Secretary
- Animusic Ensembles: Fall 2023 & Winter 2024 Conductor

Work Experience

Huron Digital Pathology ⎘   2023/09 – 2023/12 | St. Jacobs, ON
Software Engineering Intern
- Spearheaded development of a C++ library to detect preparation errors and scanning defects of biopsy slides.
- Integrated this library into the image management software as a docker container, saving 30min/day of manual quality checking per lab technician.
- Implemented extended focus imaging algorithm for slide scanners by combining features from different focal planes, resulting in clear images across all parts of thick tissue samples.
- Integrated image focus validation into the scanner software using OpenCV and Qt.
- Configured an in-house vcpkg registry and wrote ports and CMakeLists for several packages.

Ford Motor Company ⎘   2023/01 – 2023/04 | Oakville, ON
Software Engineering Intern
- Developed the Ford Pro features ⎘ and gallery ⎘ page templates used by 30+ vehicle models with React.
- Created shared mobile responsive components in TypeScript, achieving 100% test coverage using Jest.
- Configured Tekton to forward jobs to Jenkins in order to preserve pipeline runs and logs.

Trend Micro ⎘   2022/05 – 2022/08 | Ottawa, ON
Infrastructure Co-op
- Programmed a Slack bot handling 200+ requests per month to the infrastructure team using AWS Lambda and DynamoDB which eliminated 100% of missed and delayed responses.
- Created deployment pipelines with Serverless Framework and Jenkins.

Projects

Lofi Music Generator ⎘
A Java program that procedurally generates and plays lofi jazz music with custom synths with digital mixer.
- Developed melody generation algorithm for continuous original music based on jazz music theory.
- Created digital mixer GUI that allows customization of pan, volume, chords to make a mix 'yours'.
- Used OOP patterns to create instruments, notes, patterns, and intefaces.

Balls & Walls ⎘
A physics game where the player draws a limited amount of walls for a ball to bounce on to go in a basket.
- Wrote custom physics engine simulating movement and collisions between objects in Python, Tkinter.
- Implemented a level editor that can place objects, adjust initial force of the ball and number of walls.

Tuesday Night Tempo ⎘
A fun interactive rhythm game that uses a acoustic drum set as a controller.
- Configured Arduino Leonardo and microphones to detect acoustic input and act as an HID controller.
- Developed audio processing system in C++ to detect and distinguish between drum and cymbal sounds.
- Winner at Hack the North 2021 (top 17/447 projects).

Skills

Languages: C++, C, Python, TypeScript, Java
Technologies: OpenCV, Qt, Flask, React, Express, Node, Firebase, AWS, Docker, Jenkins