

Geo Lee

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INTERESTS

Real-Time Interactive and Generative AI • Machine Learning for Multimedia • Mathematical Foundations of AI

EXPERIENCE

Undergraduate Research Assistant, UBC Pacific Laboratory of Artificial Intelligence (PLAI) | 2024 - 2025

- Designed and implemented a shared memory buffer for real-time inference, enabling direct low-latency synchronization between Minecraft (visual frames, keyboard and mouse inputs) and model-generated actions at 20Hz to match game tick rate, ensuring deterministic real-time behaviour.
- Profiled and finetuned PyTorch inference latency bottlenecks affecting real-time agent interaction, identifying performance constraints across the model execution stack.
- Designed and implemented solutions for real-time synchronization and timing inconsistencies within the Minecraft rendering engine/mod interface, addressing frame-state and input latency constraints.
- Engineered and optimized a low-latency streaming Whisper (ASR) pipeline on AWS EC2 GPU instances, designing multi-stream audio processing for synchronized real-time inputs
- Evaluated and compared multiple embodied AI Minecraft agents in a live interactive environment, analyzing architectural and behavioural performance differences.
- Contributed to the production deployment of a large-scale multimodal data collection platform, supporting thousands of hours of live user interaction data capturing gameplay data.
- Automated distributed multimodal data collection pipelines using AWS (EC2, S3, DynamoDB, Lambda).

Undergraduate Teaching Assistant, University of British Columbia | 2025

- CPSC 221: Data Structures and Algorithms

TECHNICAL SKILLS

- **Programming:** Python • C++ • C • Java • TypeScript • JavaScript • Bash • SQL • MATLAB • Julia
- **Machine Learning:** Data Collection • Model Training • Model Deployment • Inference Optimization
- **Systems & Performance:** Real-Time Systems • GNOME / KDE Porting • PipeWire / Linux Audio Stack
- **Cloud & Infrastructure:** AWS (EC2, S3, DynamoDB, Lambda, Custom AMIs) • Linux Systems

EDUCATION

The University of British Columbia | 2022 - Present

Bachelor of Science (B.Sc.) Combined Honours in Computer Science and Mathematics

RESEARCH MANUSCRIPTS (First Author)

- Comparative Analysis of Embodied AI Agents in Minecraft ([PDF](#)) | 2025
- A Software Simulation of the Proof of Roth's Theorem on Arithmetic Progressions ([PDF](#)) | 2022
- A Deep Neural Network-Based Music Key Detection System ([PDF](#)) | 2022

AWARDS

AML-TN Award (2025) • SURE Award (2025) • NSERC USRA (2023) • Governor General's Award (2022)

PERSONAL INTERESTS

Electronic Music Production • Soccer