Liam Mercier

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Education

Simon Fraser University   2025
Bachelor of Science in Computer Science, with distinction
Minor in Mathematics, Concentration in Artificial Intelligence

- Relevant courses: Deep Learning, Computer Vision, Intelligent Systems, Computational Data Science
- President's honor roll

Projects

Silent Tanks │ C++, Qt, Boost, PostgreSQL, OpenSSL, CMake   GitHub

- Developed an asynchronous, multithreaded game server capable of supporting concurrent matches
- Improved maintainability through modular design, separating server components for client connections, user management, matchmaking, database operations, and administrative actions
- Integrated PostgreSQL backed by a thread pool with per-user request serialization
- Implemented secure authentication using database salting and SSL encryption for data confidentiality
- Created a bucket based matchmaking system and custom extension of the elo rating system to balance match quality, queue times, and reduce rating inflation
- Designed a cross-platform GUI client in C++ and QML with a material design inspired dark interface
- Implemented a user managed server connection page, social features, and interactive replay viewer

Audio Deepfake Detection │ Python, PyTorch, scikit-learn   GitHub

- Designed an end-to-end data pipeline to preprocess audio, extract different features, and train models
- Compared in-context performance and transfer learning using domain specific criteria across models shown to be promising in external works and competitions
- Performed ablation studies to compare how model architectures and feature extraction techniques effect test performance and inference time

Corridor Generating Multi-Agent Pathfinding │ Python   GitHub

- Implemented a multi-agent pathfinding (MAPF) algorithm by interpreting a research paper into a working prototype with a domain specific evaluation methodology
- Benchmarked runtime and solution quality against standard MAPF choices to determine viable use cases and shortcomings in different environments
- Delivered a researched report in academic style to communicate findings and recommendations

Social Media Sentiment Analysis │ Python, scikit-learn, NLTK   GitHub

- Interfaced with external APIs to automate collection of 30,000 text samples from target communities
- Implemented a data processing pipeline using the natural language toolkit to tokenize and normalize text

Experience

Mathematics and Computing Tutor   2023 - Present

- Applied evidence-based learning strategies to improve mean z-scores by 0.30 and average percentile ranks by 10.8% for students in undergraduate level courses

Skills

Languages: C++, C, Python, QML, SQL

Libraries: Boost, Qt, scikit-learn, PyTorch, Pandas, NumPy