Evan **Loughlin**

Software Engineer - Machine Learning

About Me

Experienced Software Engineer with a strong Machine Learning background. I love working on cool, challenging problems and continuously expanding my mind.

Canada
Australia
Remote

Areas of Specialization

Machine Learning • Artificial Intelligence • Software Engineering • Data Analytics

Interests

Scientific Computing • AI Ethics • Algorithms • History • Rock Climbing • Outdoors

Portfolio
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Short Resumé

2022–2024 — **Software Engineer / Data Analytics**
Highlight · New York, NY / Remote
Full stack software engineering and Machine Learning for Marketing Tech Startup. Developed Live Dashboard for marketing and analytics, supporting 50,000 users. Lead efforts in Data Analytics team, developed ML models (Random Forest), and a unique Genetic Algorithm solution. **Typescript** **C#** **React** **Go** **Microservices** **Terraform** **AWS** **Machine Learning** **Python** **SKLearn** **PyTorch** **PostgreSQL**

2021–2022 — **Modeling and Simulation Engineer (R&D)**
Cerio · Ottawa, ON / Remote
R&D - High Performance Computing Networks. Developed tools for data analytics, conducted experiments, simulations, and visualizations. **Python** **Machine Learning** **Anaconda** **Data Visualization** **Python** **SKLearn** **Go**

2019–2020 — **Software Engineer**
Circle Cardiovascular Imaging · Calgary, AB
Developed software for CVI42 (MRI Cardiovascular Imaging) - using SIMD Vectorization libraries for CPU Optimization. Used Convolutional Neural Networks for detecting cardiovascular irregularities and delineating anatomical regions. **C++** **CPU Optimization** **Computer Vision** **Machine Learning** **Medical Imaging** **Go**

2018-2019 — **Software Engineer**
Lockheed Martin · Calgary, AB
Developed mission-critical systems for UAVs (military drones) using C++, Qt, and Python. Practiced TDD and clean architecture techniques. **C++** **Qt** **Python** **Robotics** **SQL** **Test Driven Development**

Education

2019–2024 — **MSc Computer Science - Machine Learning / AI**
Georgia Institute of Technology · GPA: 3.6 / 4.0

2016–2018 — **BSc Computer Science**
University of Calgary · GPA: 3.4 / 4.0

2007–2012 — **BSc Civil Engineering**
University of Calgary · GPA: 3.4 / 4.0

2011 — **International Exchange**
Universität Stuttgart · Computational Mechanics of Materials (COMMAS)

Skills

- **Python / Anaconda**
- **Go, C#, C/C++**
- **ML Algorithms**
- **Javascript / Typescript**
- **AWS**

Designations

2021 Professional Engineer (APEGA)

Languages

English	C2	Native
German	B1	● ● ○ ○

Programming Languages

Python **C** **C++** **C#** **Go** **Javascript** **Typescript** **Java** **LaTeX** **Nix** **Bash** **Arduino**

Frameworks & Tools

SKLearn **PyTorch** **React** **Docker** **Kubernetes** **Node** **Qt** **Go** **GraphQL** **Google Test** **CMake** **Jenkins** **Docker** **PostgreSQL** **Hasura** **Github Actions** **Neovim** **Unity**

Work Experience (Detailed)

- **Highlight** — New York, NY / Remote
  Software Engineer - Data Analytics — *Aug 2022 - Aug 2024 (2 Years)*
  - **Overview**: Software engineer for start-up web client built in Go, C#, React (Typescript), PostgreSQL, utilizing AWS with a micro-services architecture. Responsible for all aspects of engineering including design, architecture, coding, database design, infrastructure, testing, quality, process improvements, security, reliability, leadership, and mentoring.

Software Engineering	• Implemented an event-driven E-mail and Slack notification system using AWS SQS. • Implemented an authentication system using AWS Cognito. • Implemented a phone-verification system for user authentication using Brevo. • Developed a React dashboard with C# back-end for Data Analytics and real-time visualization. • Implemented SRE's and development environment improvements such as DataDog, ephemeral environments in AWS / Terraform, ConfigCat (feature flags) • Mentored and onboarded junior team members. Worked with Product Managers to devise solutions and optimize value creation
Machine Learning / AI	• Designed and implemented a Genetic Algorithm for distribution & shipping optimization. • Researched and implemented LLMs for Qualitative Data analytics. • Built a ML model (XGBoost / Random Forest) predicting trends & correlations in demographic and marketing data.

- **Cerio (formerly Rockport Networks)** — Ottawa, ON / Remote
  Modeling and Simulation Engineer (R&D) — *Mar 2021 - Aug 2022 (1.5 years)*
  - **Responsibilities**: R&D for Rockport's switchless HPC network solutions; Myriad responsibilities including tool development (Go, Python / Anaconda, Docker) for data analytics, conducting experiments, simulation, and visualization to inform decision making and prioritization.

Software Engineering	• Owned, wrote, and maintained a CLI Tool in Go (RPCLI) for Network Analytics, Debugging, Data Extraction, Node State Modification used by both Field Engineers and R&D • Built a tool for processing DUMPI Network Trace File data - MPI (Parallel Computing) standard - to optimize and study distributed computing network behaviour
Machine Learning / AI	• Utilized unsupervised and time-series ML approaches to analyze, predict, and learn network optimizations .

- **Circle Cardiovascular Imaging** — Calgary, AB
  Software Engineer — *July 2019 - Dec 2020 (1.5 years)*
  - **Responsibilities**: Software development for CVI42 (Cardiovascular MRI Imaging Suite), and CPU Vectorization (SIMD) libraries, on Windows and Linux (GE Platform). Skills: C++, Qt5 Development, Bash Scripting, QML, Go, Python, GDB Debugging, Google Test, Git, CMake. Exposure to OpenGL, and multi-threading.

Software Engineering	• Independently designed and implemented a number of projects including a Crash Reporter, C++ Clean Architecture Code Generators, a SIMD Vectorization templated code generator, and a Server Test Harness
Machine Learning / AI	• Worked with ML Engineering Team to devise and optimize Convolutional Neural Networks (CNNs) for Medical Imaging Analysis and Segmentation • Optimized Computer Vision algorithms using Vectorization and SIMD libraries for improved performance on GPU-less MRI machines.

- **Lockheed Martin** — Calgary, AB
  Software Engineer — *Aug 2018 - July 2019 (1 year)*
  - **Responsibilities**: Software development on mission critical systems for Unmanned Aerial Vehicles (UAVs), utilizing C++, Qt4/5, and Python development (Linux and Windows) within a Scrum (Agile) environment. Extensive practice of TDD, and clean architecture techniques (SOLID). Experience in OpenGL, GUI development with Qt, software design (UML), acceptance testing, formal qualification testing, and development tools including use of schroots (linux), VMWare, Git, Jenkins, Jira, Confluence, and Crucible.
  - **Products**: **VCSi** - Vehicle Control Station for controlling and monitoring Unmanned Aerial Vehicles. (Linux / Windows)
    VCS4586 - Flagship Legacy product for controlling and monitoring unmanned aerial vehicles. (Linux)
    Hydra Fusion Tools - A real-time Geospatial Information System for 3D map development (photogrammetry).

Civil Engineering

2012–2016

Various Roles - Civil / Structural Engineering
Herold Engineering, Terra HDD, Jacobs Engineering ·

Structural, Civil, Geotechnical and Project Engineer on a variety of projects including oil & gas facilities, bridges, buildings, pipeline crossings, marine structures and more. Involved in engineering, project management, inspections, and data analysis.

Steel **Wood** **Concrete** **Foundations** **Finite Element Analysis** **Earthquake Design** **Geotechnical Engineering** **Project Engineering**

Coursework

Deep Learning	**Deep Learning Specialization**: Andrew Ng: Coursera Specialization in Deep Learning, Hyper-parameter Tuning, Convolutional Neural Networks, Logistic Regression, etc.
Research Paper	**University of Calgary**: A Multi-Agent Simulation Framework for Studying Autonomous Vehicle Behaviour and Intelligent Transportation Networks Developed a simulation framework using Unreal Engine 4 (UE4) to study transportation network behavior involving autonomous and human-driven vehicles. The framework includes behavior trees and various parameters (behavioral, perception, physical) to model agent behavior.
MSc: CS7641	**Machine Learning** Supervised, Unsupervised Learning, Reinforcement Learning
MSc: CS6475	**Computational Photography** Convolutions, image and signal processing, edge detection, pyramids, Fourier transforms. OpenCV, NumPy, Python, TensorFlow
MSc: CS6601	**Artificial Intelligence** A.I. course focused on AI: A Modern Approach (Peter Norvig). Modules include A.I. Game Playing (Minimax / Alpha-Beta Pruning), Search (A*, Bi/Tri-Directional), Simulated Annealing, Constraint Satisfaction, Probability, Bayes Nets, Pattern Recognition, and Machine Learning.
MSc: CS7638	**A.I. for Robotics** Kalman Filters, Particle Filters, A* Search, PID Controllers, and SLAM (Simultaneous Localization and Mapping)
MSc: CS7637	**Knowledge-Based Artificial Intelligence** Python (NumPy and PILLOW libraries) AI agent developed to solve Raven's Progressive Matrices (a type of problem within some IQ tests).
MSc: CS7646	**Machine Learning for Trading** Machine learning for financial trading, including Pandas, Bayes Theorem, Probabilistic Machine Learning, Hedge Funds, Market Indicators, Q-Learning, Reinforcement Learning
Computational Mechanics	**Stuttgart University (Germany)** Completed several master's courses during an international exchange at Stuttgart University's (Germany) COMMAS program; topics included numerical methods, computational mechanics of geomaterials and steel, thermodynamics, environmental particle dispersion, and vector calculus.

Personal & Open-Source Projects

acku.org	**All Canadian Karate Union - Website** Wordpress website I developed and maintain, on a volunteer, pro bono basis. I was a former instructor. Integrated Calendar and Google Maps API for all instructors to manage their own clubs.
C++ Code Generator	`https://github.com/e-loughlin/CppCodeGenerator` Template-based C++ Code Generator I wrote in Go, with Qt support. Open-source with over 20 Stars on GitHub. Estimated 50,000+ downloads. Helps enforce clean coding practices.
Image Organizer Tool	`https://github.com/e-loughlin/image_renamer` Python tool for re-naming large numbers of photos to consistent filenames based on their EXIF timestamp data. Includes options for resizing images.
Sudoku Solver	`https://github.com/e-loughlin/SudokuSolver` Bored on a long flight and without internet, I wrote a brute-force recursive algorithm solution to ruin the fun of any Sudoku puzzle, in C++.
Triple Triad Solver	`https://github.com/e-loughlin/FFVIII-CardGameAI` Revisited the classic card game from Final Fantasy VIII and developed a Minimax solver with controllable search depth to enhance decision-making and improve winning chances.