Evan Loughlin

Software Engineer • AI / ML

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Portfolio: https://e-loughlin.github.io

Work Authorization: Canada: Citizen • Australia: Full Work Rights - 485 Visa (Exp. Nov 2027)

Summary

I am a Software Engineer with over 6 years of professional experience, including expertise in Machine Learning and modern AI applications across several industries: Robotics (Unmanned Aerial Vehicles), Medical Imaging (Convolutional Neural Networks), High Performance Computing (distributed computing, graph algorithms, supervised / unsupervised learning), and Marketing Tech (supervised learning, optimization algorithms, LLMs). Former career in Civil Engineering (buildings, bridges, marine, geo, oil & gas). I love building cool things and working with smart people on challenging, interesting projects that make people's lives better.

Education

- **Georgia Institute of Technology** — Atlanta, Georgia
  MSc Computer Science - Machine Learning / A.I.; GPA: 3.6 / 4.0 — *Jan. 2019 – Apr. 2024 (part-time)*

University of Calgary — Calgary, AB

- *Bachelor of Science in Computer Science; GPA: 3.4 / 4.0* — *Sept. 2016 – Jul. 2018*
- *Bachelor of Science in Civil Engineering; GPA: 3.4 / 4.0* — *Sept. 2007 – May. 2012*

- **Universität Stuttgart** — Stuttgart, Germany
  International Exchange: Computational Mechanics of Materials Program (COMMAS) — *Jan. 2011 – Aug. 2011*

Skills

- **Languages**: Python, Go, C/C++, C#, Typescript, Javascript, Bash
- **Libraries**: PyTorch, SKLearn, Pandas, Numpy, OpenCV
- **Cloud / Infra**: AWS, GCP, Terraform, Github Actions
- **Web Frameworks**: React, Django, HTML5/CSS
- **Databases**: PostgreSQL, GraphQL, CouchDB, Redis
- **ML/AL**: Deep Learning, CNN, LLMs, KNN, Boosting, Decision Trees / Random Forest, SVMs, SLAM, Randomized Optimization, Reinforcement Learning (Q-Learning), Computer Vision, Computational Photography, Search Algos

Software Engineering Experience

- **Highlight** — New York, NY / Remote
  Software Engineer - Data Analytics — *Aug 2022 - Aug 2024 (2 Years)*
  - **Overview**: Full stack software engineering and Machine Learning for Marketing Tech Startup. Developed Live Dashboard for marketing and analytics, supporting 50,000 users. Lead several efforts in Data Analytics team. Responsible for all aspects of engineering including design, architecture, coding, database design, infrastructure, testing, quality, process improvements, security, reliability, leadership, and mentoring.
  - **Skills**: C#, Go, AWS, Python, React, Typescript, GraphQL, PostgreSQL, Terraform, SKLearn, PyTorch

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 Live Dashboard (React front-end, 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. Collaborated 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 for network studies / data analytics, conducting experiments, simulation, and visualization to inform decision making and prioritization.
  - **Skills**: Go, C++, Python, SKLearn, Docker, Kubernetes

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	• Investigated the use of unsupervised and time-series ML approaches to analyze, predict, and learn network optimizations .

- **Circle Cardiovascular Imaging** — Calgary, AB
  Software Engineer - Medical Imaging — *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). Implemented Convolutional Neural Networks for medical imaging.
  - **Skills**: C++, SIMD Vectorization, Computer Vision, CNN, 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**: Developed mission-critical systems for Unmanned Aerial Vehicles (UAVs) in a Scrum (Agile) environment, with a focus on TDD and clean architecture (SOLID). Worked on the following products: **VCSi** - A ground control system for real-time UAV command and monitoring; **VCS4586** - A legacy UAV control station based on NATO standards; and **Hydra Fusion Tools** - A real-time 3D mapping and photogrammetry tool for geospatial data visualization.
  - **Skills**: C++, Computer Vision, Photogrammetry, Qt4/5, Python, OpenGL, Test Driven Development, Linux, Git, Jenkins, Crucible.

Civil Engineering Experience

- **Civil / Structural Engineer (Various Roles)** — Herold Engineering, Terra HDD, Jacobs Engineering
  Nanaimo, BC / Calgary, AB — *2012 - 2016 (4 years*

  - **Responsibilities**: Worked on a wide range of projects, including industrial facilities, marine structures, bridges, and pipeline crossings. Involved in structural and geotechnical design, inspections, project management, and construction reviews for public buildings, oil and gas facilities, and complex geographies.
  - **Projects**: SAGD Oil & Gas Facilities (CNRL Kirby South, Suncor Firebag), BC Ferries Marine Facilities, pipeline crossings under lakes and rivers, bridges, wharfs, and hydroelectric power plants.
  - **Skills**: Structural analysis (S-Frame), Geotechnical design, AutoCAD, Revit, Dynamic (earthquake) analysis, offshore pile-driving, concrete, steel, timber design, project management, construction monitoring, safety training, soil classification, borehole analysis.

Coursework - Machine Learning / AI

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 renaming 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.

Accreditations

- **APEGA** — Alberta, Canada
  Professional Engineer (P.Eng) — *Feb 2021 - Current*

Languages

- **English**
  Native Tongue
- **German**
  Intermediate (B1 Level)