

# Emiliano Garcia

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## M.A.C. CANDIDATE | B.ENG. SOFTWARE ENGINEERING | EIT (ENGINEER-IN-TRAINING)

*Graduate researcher specializing in applied machine learning and deep learning, with hands-on experience designing and developing models, training pipelines, and AI-driven systems across academia and industry. My work spans multimodal learning (speech, text, and auxiliary features), end-to-end experimentation workflows, and practical implementation of neural architectures for classification and prediction tasks. At Autodesk Research, I contributed to ML-powered data processing and modeling for complex real-world environments, while my master's research focuses on designing and evaluating deep learning pipelines through systematic experimentation and benchmarking. Engineer-in-Training (EIT) motivated by challenging research problems, rigorous empirical analysis, and building methods that translate into impactful real-world applications.*

### TECHNICAL SKILLS

Programming: Python, SQL, JavaScript, C++

ML & AI: PyTorch, TensorFlow/Keras, scikit-learn, Transformers, multimodal ML, CNNs, deep learning

Training & Evaluation: Cross-validation, ablations, explainability, hyperparameter tuning, robustness testing

Distributed & Systems: Slurm/sbatch (HPC), multi-GPU (DataParallel), Docker, Git, CI/CD

Data & Pipelines: Pandas, NumPy, preprocessing pipelines, embeddings, spectrograms, audio processing

Backend & Cloud: FastAPI, Node.js, AWS (EC2, S3, IAM), GCP

### RELEVANT PROFESSIONAL EXPERIENCE

#### **Computer Science and Physics, Wilfrid Laurier University, Waterloo, ON**

September 2025 to Present

##### ***Graduate Research and Teaching Assistant***

- Developing deep learning pipelines for multi-modal cognitive health assessment (speech, text, and auxiliary features) as part of master's thesis research.
- Designing preprocessing workflows (feature extraction, spectrograms, embeddings) and evaluating multiple neural architectures for multi-class classification and regression.
- Running systematic experiments, ablation studies, and tuning to improve accuracy and robustness; preparing manuscripts with supervisor.
- Supporting course instruction through grading, feedback, student guidance, and clarification of complex ML, data, and software engineering concepts.

#### **Autodesk Research, Autodesk, Toronto, ON**

May 2023 to September 2023

##### ***Software Developer Intern***

- Led development of AI-driven optimization solutions for the Human-Centered Building Design (HCBD) initiative, integrating advanced data science methodologies with architectural analysis to enhance space utilization and occupant experience.
- Engineered robust data processing pipelines to transform raw architectural data into clean, analyzable datasets, implementing path-planning algorithms to model and visualize occupant movement patterns within building spaces.
- Developed a sophisticated machine learning tool that optimized architectural space allocation based on occupancy patterns, demonstrating strong proficiency in Python programming and scientific computing libraries.
- Applied geometry processing techniques and visualization tools to enhance data analysis workflows, enabling better understanding of spatial relationships in architectural designs.
- Effectively communicated project progress and findings through presentations to stakeholders, while maintaining detailed internal documentation to support knowledge sharing within the HCBD team.

**Engineering Department, Thompson Rivers University, Kamloops, BC**

May 2022 to January 2023

***Undergraduate Research Assistant***

- Collaborated with Department Chair Dr. Emad Mohammed on pioneering research investigating cognitive similarities between COVID-19 and Alzheimer's disease patients through advanced machine learning techniques and audio processing.
- Developed automated systems for transforming speech data into 2D frequency representations, enabling novel approaches to disease detection through computer vision techniques.
- Engineered and evaluated ensemble learning solutions combining multiple CNN architectures to optimize prediction accuracy for Alzheimer's disease detection from speech patterns.
- Designed and implemented machine learning models using clustering techniques to identify meaningful patterns in demographic and cognitive data.
- Contributed to research paper preparation through data analysis, methodology documentation, and visualization of key findings.

**Enterprise Systems, Thompson Rivers University, Kamloops, BC**

September 2023 to December 2023

***Software Analyst Intern***

- Developed automation solutions for the Enterprise Systems team, leveraging FormFusion and Argos tools to streamline data extraction and reporting processes from Oracle databases.
- Designed and implemented custom database queries and reporting workflows to meet complex institutional requirements, significantly improving efficiency of business operations.
- Optimized system integration between enterprise tools through automated data transformation pipelines, reducing manual processing time while ensuring data accuracy and compliance.

**SELECTED PROJECTS****RAG Benchmark Service*****Benchmark-driven retrieval-augmented generation system for scientific question answering***

- Designed and implemented an end-to-end RAG system with evaluation-first development, defining retrieval metrics (Recall, nDCG, MRR) before deployment.
- Built multiple retriever baselines (BM25 and dense embeddings with FAISS) behind a unified interface, enabling controlled comparisons and gated promotion.
- Implemented reproducible indexing, artifact versioning, and scheduled evaluation workflows with drift detection and regression safeguards.
- Deployed a FastAPI service with monitoring, request logging, and CI-driven retriever promotion logic to demonstrate production-oriented ML discipline.

**PocketGuide*****Domain-adapted LLM for structured travel guidance with evaluation-first design and offline inference***

- Developed a compact, domain-specialized language model optimized for structured JSON outputs, uncertainty signaling, and offline inference on consumer hardware.
- Implemented a teacher–student synthetic data generation pipeline with quality filtering to produce high-fidelity travel instruction data.
- Fine-tuned a 7B open-source LLM using parameter-efficient LoRA, with reproducible training configurations, checkpointing, and systematic evaluation.
- Designed evaluation benchmarks to assess factual consistency, instruction adherence, and robustness relative to the base model.
- Packaged the system for local inference with schema validation and failure analysis to support iterative model refinement.

## EDUCATION AND CERTIFICATIONS

### **Master of Applied Computing**

September 2025 to Present

#### *Wilfrid Laurier University, Waterloo, ON.*

- Recipient of the Laurier Graduate Scholarship, awarded for academic excellence.
- Appointed as Research Assistant under the supervision of Dr. Emad Mohammed, continuing prior research collaboration in machine learning and cognitive health.
- Appointed as Teaching Assistant, supporting undergraduate courses through grading and academic support.
- Fully funded master's program through Laurier Graduate Scholarship, Research Assistantship, and Teaching Assistantship, totaling \$52,000 in guaranteed funding.

### **Bachelor of Engineering in Software Engineering**

September 2020 to April 2025

#### *Thompson Rivers University, Kamloops, BC.*

- Contributing author to pioneering research in cognitive disease detection using machine learning, awarded the Undergraduate Research Apprenticeship Grant for innovative methodology.
- Recipient of the Jorge Campos Award for outstanding academic achievement in software engineering.
- Consistently recognized on Dean's List for academic excellence.
- Completed two successful co-op work terms, gaining valuable industry experience at Autodesk and in enterprise systems.

### **Bicultural High School**

August 2016 to May 2019

#### *ITESM, Colima, Mexico.*

- Led FIRST Robotics Competition team to multiple regional/world rankings and secured NASA sponsorship.
- Active in Student Government and Picosatellites Club; maintained 92/100 GPA on a 50% merit-based scholarship.

## HONOURS, GRANTS, AND AWARDS

Author of a research paper exploring cognitive connections between Alzheimer's disease and COVID-19 using machine learning (submitted for review) in collaboration with Thompson Rivers University. Recipient of multiple awards and scholarships totaling over \$30,000, recognizing both academic excellence and research innovation.

- Undergraduate Research Apprenticeship Grant

- Jorge Campos Scholarship recipient

- Academic Talent Scholarship

- Dean's list on multiple occasions

## OTHER PROFESSIONAL EXPERIENCE

### **Lululemon, Kamloops, BC**

October 2024 to April 2025

#### **Guest Experience Lead**

- Directed daily store operations and coached team members to achieve sales and efficiency targets.
- Implemented structured feedback and training practices to foster collaboration and high performance.

### **Lululemon, Kamloops, BC / Waterloo, ON**

April 2024 to Present

#### **Educator**

### **Walmart, Kamloops, BC**

March 2021 to May 2023

#### **Cashier / Customer Experience Salesfloor Associate**