Emiliano Garcia

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MACHINE LEARNING ENGINEER | APPLIED DEEP LEARNING | EIT (ENGINEER-IN-TRAINING)

Applied ML engineer and graduate researcher (M.A.C. candidate) building deep learning systems end-to-end; from data preprocessing and training pipelines to evaluation and deployment-ready services. Experience spanning multimodal modeling (speech, text, auxiliary features) and industry ML tooling at Autodesk Research, with a focus on rigorous experimentation, reproducibility, and real-world impact.

EDUCATION

Master of Applied Computing (M.A.C.)   Sep 2025 to Present
Wilfrid Laurier University, Waterloo, ON.
- Thesis stream; graduate research on multimodal ML (speech + text) under limited-data constraints.
- Graduate Research Assistant / Teaching Assistant.

Bachelor of Engineering in Software Engineering   Sep 2020 to Apr 2025
Thompson Rivers University, Kamloops, BC.
- Co-op; Undergraduate Research Assistant in machine learning for speech analytics.

TECHNICAL SKILLS

Languages: Python, SQL, JavaScript, C++
ML: PyTorch, TensorFlow/Keras, scikit-learn, Transformers; multimodal ML, CNNs, deep learning
Experimentation: ablations, cross-validation, hyperparameter tuning, robustness testing, explainability
Systems: Git, Docker, CI/CD; Slurm/sbatch (HPC), multi-GPU (DataParallel); FastAPI, Node.js; AWS (EC2/S3/IAM), GCP
Data: NumPy, Pandas; preprocessing pipelines, embeddings, spectrograms, audio processing

EXPERIENCE

Wilfrid Laurier University, Waterloo, ON   Sep 2025 to Present
Graduate Research and Teaching Assistant
- Developing deep learning pipelines for multimodal cognitive health assessment (speech, text, and auxiliary features).
- Built preprocessing workflows (feature extraction, spectrograms, embeddings) and evaluated frozen-encoder audio/text models for low-data cognitive assessment.
- Ran subject-independent 5-fold CV with ablations and robustness checks; late-fusion reached 0.856 ± 0.038 macro-F1 and 0.922 ± 0.030 AUC; documented results for manuscript preparation.
- Supporting course instruction through grading, feedback, and student guidance in ML, data, and software engineering.

Autodesk Research (Autodesk), Toronto, ON   May 2023 to Sep 2023
Software Developer Intern
- Built a schedule-optimization algorithm from scratch for HCBD; evaluated millions of candidate scenarios and achieved ~60% lower walking distance than manually constructed baselines.
- Prototyped an ML-based approach to learn occupancy patterns and guide layout/scheduling decisions; validated performance using objective walk-distance metrics across large-scale scenario sweeps.
- Engineered data processing pipelines to transform raw architectural geometry into analyzable datasets/graphs; implemented path modeling to simulate occupant movement and quantify walk-distance outcomes.
- Developed geometry processing and visualization utilities to communicate findings; presented results and documentation to researchers and cross-functional stakeholders.

Thompson Rivers University, Kamloops, BC   May 2022 to Jan 2023
Undergraduate Research Assistant
- Conducted ML research with Dr. Emad Mohammed on cognitive similarities between COVID-19 and Alzheimer's disease using audio processing and statistical learning.
- Built automated pipelines to transform speech into 2D frequency representations for computer-vision-based detection.
- Trained and evaluated ensemble CNN approaches for Alzheimer's detection from speech; performed clustering on demographic and cognitive features.
- Contributed to research paper preparation through analysis, methodology documentation, and result visualization.

Thompson Rivers University (Enterprise Systems), Kamloops, BC   Sep 2023 to Dec 2023
Software Analyst Intern
- Built reporting and data extraction automations using FormFusion/Argos over Oracle databases to streamline institutional workflows.
- Developed custom database queries and automated data transformation pipelines to reduce manual processing.

SELECTED PROJECTS

RAG Benchmark Service
Benchmark-driven retrieval-augmented generation system for scientific QA
- Built an evaluation-first retrieval system on SciFact (5,183 docs; 300 labeled queries), implementing Recall@K, nDCG@K, and MRR@K with timestamped comparison reports.
- Implemented BM25 and dense/FAISS retrievers behind one interface; benchmarked BM25 (R@10 0.776, nDCG@10 0.652) vs dense (R@10 0.783, nDCG@10 0.645) to quantify trade-offs.
- Deployed a FastAPI service with JSONL logging and /metrics; added PSI drift checks, weekly eval, gated promotion, and 239 tests.

PocketGuide
Domain-adapted LLM for structured travel guidance with offline inference
- Built an evaluation-first LLM adaptation workflow with a fixed 20-prompt benchmark suite (parse success, schema compliance, uncertainty markers) to measure improvements before deployment.
- Implemented a teacher–student synthetic instruction pipeline with multi-stage quality gating and provenance tracking (prompt hashes, config snapshots) to generate high-fidelity training data.
- Fine-tuned Llama-2-7B with LoRA across 5 iterations, improving parse success from 80% to 100%; quantized to GGUF (llama.cpp) for offline inference on consumer hardware.

RESEARCH & AWARDS

- Manuscripts (submitted/under review, 2): (1) compute- and data-efficient frozen-encoder speech + transcript modeling for cognitive assessment with lightweight trainable heads (5-fold CV; 0.856 ± 0.038 macro-F1, 0.922 ± 0.030 AUC); (2) speech-based ML analysis of cognitive similarities between COVID-19 and Alzheimer's disease. Contributions: experiments, evaluation, analysis.
- Laurier Graduate Scholarship; Undergraduate Research Apprenticeship Grant; Jorge Campos Award; Dean's List (multiple terms).

LEADERSHIP

Lululemon, Kamloops, BC / Waterloo, ON   Apr 2024 to Present
Guest Experience Lead / Educator
- Directed daily store operations and coached team members to meet sales, service, and efficiency targets.
- Implemented structured feedback and training routines to improve collaboration, consistency, and team performance.