Mehrdad Momeni Zadeh

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Skills

Languages & Frameworks: Python, C/C++, Go, Java, MATLAB, R, SQL
Libraries: PyTorch, scikit-learn, TensorFlow, Wandb, Hydra, JAX, NLTK, OpenCV, CMake, Gin, Chi (Go)
Technologies: Docker, Git, Google Cloud Platform, Kubernetes, Linux (Ubuntu), CLI, RabbitMQ, MongoDB
Methodologies: Agile (Scrum), Functional Programming, OOP

Experience

DeLTA Lab — Simon Fraser University Burnaby, BC
Undergraduate Researcher — Scientific Machine Learning *Dec 2024 – May 2025*

- **Second author** on ***NeurIPS 2025*** paper *"Learning Data-Efficient & Generalizable Neural Operators via Fundamental Physics"*, co-led with Ph.D. student Siying Ma under **Prof. Wuyang Chen** and **Vijay Ganesh**.
- Redesigned the Transformer core, boosting accuracy by **12%** on **5** PDE benchmarks and cutting training cost **4×**.
- Added **rotary positional embeddings** for stability, enabling reliable **5-step** future forecasts without drift.
- Moved training to 8 × RTX 6000 GPUs and **Google Cloud TPU v4** pods; mixed-precision shrank each epoch from **3 h to 45 min** (**75%** faster).
- Built one-command experiment runners with **Hydra** + **Weights & Biases**, letting teammates launch tests in under 10 minutes.
- Containerised the full stack in Docker and wrote install docs so external labs can reproduce results in a single script.

Projects

RageVision – Twitch Emotion Classifier | *Python, PyTorch, MobileNetV2* | *GitHub* *Jan 2025 – Mar 2025*

- Collected and labelled **10,800** images from **120** Twitch clips to build a balanced "rage / non-rage" dataset; automated video-to-frame extraction with OpenCV.
- Fine-tuned a lightweight vision model (MobileNetV2) to **86%** accuracy with **90%** detection rate on rage events.
- Automated six hyper-parameter sweeps and prototyped an audio-video fusion variant that reached **79%** accuracy.

Neuro Driver | *Python, Pyglet, Genetic Algorithms* | *GitHub* *Oct 2024 – Dec 2024*

- Built a **2D car simulator** with a custom neural network, reducing collisions by **20%** over 50 training generations.
- Implemented a full **genetic algorithm** that lifted track-completion rates by **30%**.
- Streamlined parameter sweeps and visualisation with **Makefile** automation.

Micro Gopher | *Go, Docker, Kubernetes* | *GitHub* *Aug 2024 – Nov 2024*

- Converted a monolith into a distributed **Go micro-services** platform, improving scalability and fault isolation.
- Delivered core services: frontend, auth (**Postgres**), logging (**MongoDB**), **RabbitMQ** listener, and mailer, communicating via REST, RPC, gRPC and AMQP.
- Deployed with **Docker Swarm** and **Kubernetes**, supporting high-volume traffic and rolling updates with **<10 min** downtime per release.

Education

Simon Fraser University Burnaby, BC
B.Sc. Computer Science *GPA: **3.38 / 4.33***
Expected Graduation *Dec 2026*

- **Dean's Honour Roll** (2024).
- **Relevant coursework:** Data Structures, Machine Learning, Deep Learning, Affective Computing, Data Communication and Networking, Computer Vision