Erfan Miahi — ML Research Engineer

Canada – Toronto

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HIGHLIGHT OF SKILLS & QUALIFICATIONS

- **9 years in AI research**: Published **6 top-tier papers** with **150+ citations**, including **AIJ**, **MLJ**, **TMLR**.
- **5 years in MLE/SWE**: Built scalable Reinforcement Learning (RL) pipelines for impactful real-world applications.
- **Collaborations with top ML labs**: M.Sc. at **Richard Sutton**'s RLAI Lab; collaborated with **Google DeepMind**.
- **End-to-end understanding of training models**: Built GPU kernels in *Triton* and distributed ML training systems.
- **Exceptional communication skills**: Excel at mentoring diverse individuals across technical and business domains.

KEY TECHNICAL SKILLS

Languages	**Python** (Advanced), C++, **Triton**, SQL, JavaScript, TypeScript, Java
ML Frameworks	**PyTorch**, TensorFlow, Jax, **TRL**, Transformers, PEFT (LoRA), vLLM, Unsloth (Kernels)
Distributed Training / HPC	DDP, **FSDP**, DeepSpeed, Megatron-LM, Accelerate, **trlX**, Ray (RLlib, Train)
Infrastructure	**Kubernetes**, Docker, Slurm, Kubeflow, Ray Cluster, Terraform, PostgreSQL, Redis, S3
Experimentation & MLOps	**W&B**, GitHub Actions, Hydra, Pytest, Optuna, MLflow
Cloud	GCP (GKE, CE), AWS (EKS, ECS, EC2), Azure, Compute Canada HPC, Nebius
Foundations	**ML/RL/DL**, **LLMs/VLMs**, **RLHF/RLVR**, RAG, Math, Algorithms & Data Structures
Methodologies	Agile, MLOps, CI/CD, TDD, OOP, Design Patterns

RELEVANT EXPERIENCES

Technical Co-Founder   **Aug 2023 – Present (1 yr 6 mo)**
Fronix (Website) — formerly IntractAI   *Toronto, Canada*

Co-founded startup pivoting from coding assistants to RL fine-tuning specialized reasoning models for enterprises.

- **Led reasoning R&D** on Graph-RAG and fine-tuning techniques, improving code pass@1 by 20 pp.
- **Built scalable distributed stack** on 16×GPUs/2 nodes, cutting fine-tuning wall-time 2.1x.
- **Post-trained 3–70 B LLMs** with GRPO & PPO for reasoning; +12 pp accuracy on internal evals.
- **Cut token latency 4x** via QLoRA quantization, vLLM, FlashAttention-2, fused KV-cache.
- Accepted to Antler & NextAI (<3-5% admit); interviewed by Y Combinator (<7% admit).

Machine Learning Research Engineer   **Nov 2022 – Oct 2024 (2 yrs)**
DeepR Analytics (Proprietary Trading Firm)   *Remote, Canada & US*

Founding ML research engineer conducted research and built large-scale auto-trading pipeline and research tooling.

- **Built PyTorch pipeline that trained >1 M policy & value nets**, adding $35+ daily PnL/asset/share.
- **Implemented SOTA papers & devised RL algorithms** in 10+ research projects; added $20+ daily PnL/asset/share.
- **Migrated training/backtest stack to AWS ECS & Fargate**, enabling on-demand scaling across 100+ assets.
- **Optimized data pipeline, simulated environments, eval pipeline**, async I/O; cut epoch time 9x and EC2 cost 4x.
- Raised test coverage to 85% with Pytest; slashed prod bugs 45% across ECS, CI, and C++ engine.

Research Associate   **Sep 2022 - Dec 2022 (4 months)**
University of Alberta (RLAI Lab)   *Edmonton, Canada*

- **Redesigned ML codebase** for sensory data prediction, accelerating experimentation and analysis by **50%** (Publication).
- **Developed and deployed optimized offline RL and control algorithms**, improving system performance by **21%**.

Assistant AI Consultant   **Nov 2021 - Mar 2023 (1 year 5 months)**
Alberta Machine Intelligence Institute (Amii)   *Edmonton, Canada*

- Provided continuous technical coaching to 5 enterprise teams, aligning projects with their business needs.
- Consulted an energy firm on problem formulation and ML design, **potentially saving $10-15M annually** (Blog).

AI Mentor (For More Info)   **Jan 2017 - present (7+ years)**
*Self-employed (**Leadership**)*   *Remote/Edmonton, Canada*

- Mentoring **10+ students** (past and present) in AI research and engineering for **7+ years**.
- Mentored a University of Guilan (rank 1422) student to secure a PhD at **Michigan State** University (rank 116).

Software Developer   **Nov 2015 – Nov 2017 (2+ years)**
Nilasoft   *Rasht, Iran*

- **Built and optimized** a Spring/Angular e-commerce platform for **1K+ users** with **99.9% uptime**.

EDUCATION

M.Sc. in Computing Science **Jan 2021 - Aug 2022**
University of Alberta *Edmonton, Canada*
- **Supervisors**: *Martha White* & *Marlos C. Machado*
- **Thesis**: Feature Generalization in Deep RL: An Investigation into Representation Properties
- **Committee:** *Martha White* (**UoA**) & *Marlos C. Machado* (**Ex DeepMind**) & *Matthew E. Taylor* (**Ex BorealisAI**)

B.Sc in Computer Engineering **Sep 2015 - Aug 2019**
University of Guilan *Rasht, Iran*
- **Ranked 1st in class**

RELEVANT PROJECTS (*60+ GitHub Projects*)

A Composable Reinforcement Learning Pipeline for Post-training LLMs for Reasoning Repo
AI-first Software Development Copilot for Specialized Industries (e.g., Optics) Backend
Distributed RL Framework: A3C/PPO/IMPALA Implementations Repo
Open-Source RL Framework for Fast Experimentation on Real-World Problems (Sole Contributor) Repo
Circuit Sketch to VR: Meta Quest 3 Circuit Analyzer (Meta Hackathon 1st Place) Backend / Frontend
Mixed-Precision Library for LLM Training with Torch JIT and Bitwise Manipulation (FP8 and BF16)
Distributed LLM Training Infrastructure using Kubernetes and Terraform (DDP/FSDP in PyTorch)
Solutions to Assignments of Deep RL Course by UoC, Berkeley (100+ Stars on GitHub) TensorFlow/PyTorch

SELECTED PUBLICATIONS (*150+ Citations on Google Scholar*)

Calibrating LLM Confidence by Probing Perturbed Representation Stability
  Reza Khanmohammadi, Erfan Miahi, et al.
Under review at ACL Conference

Investigating the Properties of Neural Network Representations in Reinforcement Learning
  Han Wang, Erfan Miahi, Martha White, Marlos C. Machado, et al. (**DeepMind Collaboration**) Paper
Published in Artificial Intelligence Journal (AIJ)

GVFs in the Real World: Making Predictions Online for Water Treatment
  Muhammad K. Janjua, Haseeb Shah, Martha White, Erfan Miahi, et al. Paper
Published in Machine Learning Journal (MLJ)

Scalable Transfer Evolutionary Optimization: Coping with Big Task Instances
  Mojtaba Shakeri, Erfan Miahi, Abhishek Gupta, Yew-Soon Ong (**NTU & A*STAR Collaboration**) Paper/Code
Published in IEEE Transactions on Cybernetics Journal

Resmax: An Alternative Soft-Greedy Operator for Reinforcement Learning
  Erfan Miahi, Revan MacQueen, Alex Ayoub, Abbas Masoumzadeh, Martha White Paper
Published in Transactions in Machine Learning Journal (TMLR)

Genetic Neural Architecture Search for Automatic Assessment of Human Sperm Images
  Erfan Miahi, Seyed Abolghasem Mirroshandel, and Alexis Nasr Paper
Published in Expert Systems and Applications

AWARDS & ACHIEVEMENTS

- **1st Place at Llama Meta Hackathon Toronto 2024 (45 teams and 150 attendees) - Won $25K, Unitree Robot, and 4 Ray-Bans**
- **Reached Y Combinator Summer 2024 interview stage (top 7% applicant)**
- **Placed among the top 10% of reviewers in ICML 2022**
- **Ranked 6th in World Robot Challenge 2018 (received travel grant to Japan)**
- Abrishamchian Reward (Awarded for graduating with the highest distinction among all students of the University)
- Top Researcher in Computer Engineering Group
- Honorable Mention in ACM/ICPC 2016

LANGUAGES

English - Fluent   **Persian** - Native