

# MAHAN FATHI

☎ +1 (514) 213-9373 ◊ ✉ mahan0fathi@google.com ◊ 🌐 MahanFathi ◊ 🌐 mahanfathi

## HIGHLIGHTS

- **3+ years** of academic and industrial expertise in developing large-scale **deep learning research infrastructure**, with a focus on areas such as *Large Language Modeling*, *Reinforcement Learning*, and *Computer Vision*.
- **3+ years** of work experience as **Software Engineer**, **Data Scientist**, and **Team Leader** – e.g., user-centric ML, high-throughput streaming microservices, gigantic image datasets.
- **Proud of switching gears** – pun intended: coming from a Mechanical Engineering background, I decided to not settle for anything less than following my true passion, robotics. RL just happened to be a recently popularized means to this end.

## SELECTED EXPERIENCES

**Google DeepMind** ♦ *Student Researcher (SR) – LLM* Montréal, QC ♦ Apr. 2023 – Present

- Focus: Large Language Modeling and State-Space Models
- Supervised by **Ross Goroshin**

**Google Brain** ♦ *Student Researcher (SR) – Deep RL* Montréal, QC ♦ Aug. 2022 – Feb. 2023

- Member of MonRL team, led by **Marc G. Bellemare**
- Supervised by **Ross Goroshin**
- Focus: The intersection of Sequence Modeling and offline/online Reinforcement Learning

**Mila: MTL. Inst. for Learning Algs.** ♦ *MSc Student* Montréal, QC ♦ Jan. 2021 – Present

- Advised by **Pierre-Luc Bacon** at Université de Montréal
- Research Areas: Sample-efficient Reinforcement Learning, Energy-based Policy/Imitation Networks, Continuous Sequence Models (HiPPO-inspired) in RL and Control

**Polytechnique Montréal** ♦ *Teaching Assistant* Montréal, QC ♦ Sep. 2021 – Jan. 2022

- Teaching Assistant for INF8953DE – Reinforcement Learning, by **Sarath Chandar**
- Responsible for designing the majority of the assignments

**Aalto University** ♦ *Research Assistant* Espoo, Finland ♦ Jun. – Sep. 2019

- Supervised by **Perttu Härmäläinen**
- Developed a framework that offered *MuJoCo* dynamics step functions as differentiable *PyTorch* operations
- Controlled systems as complicated as *Humanoid* using analytic policy gradients

**CafeBazaar** ♦ *Senior SWE/DS and TL* Tehran, Iran ♦ Oct. 2018 – Jan. 2021

- Worked at **Balad**, which is now the biggest domestic map and navigation application of Iran (joined at userbase of 100k and left when at ~6M)
- Technical Leadership and Product Management of Data Infrastructure, a team of 7 Data Scientists, and ETA&Traffic, a team of 4 Software Engineers and 3 Data Scientists
- Computer Vision Scientist, information extraction from street and aerial imagery
- Software Engineer, developed the first traffic logging&predicting service of Balad (solo)

**TAPSI** ♦ *Backend Developer* Tehran, Iran ♦ Feb. – Oct. 2018

- Among the biggest Iranian tech companies, TAPSI is a ride-hailing platform with millions of monthly active users.
- Improved finished rides rate by 3% in a self-directed project, and rewrote many legacy services including Location and Dispatch from scratch

## PUBLICATIONS

♦ **NeurIPS'23** **BLOCK-STATE TRANSFORMERS**

*Mahan Fathi\*, Jonathan Pilault\*, Orhan Firat, Christopher Pal, Pierre-Luc Bacon, Ross Goroshin*

♦ **ICLR'24 – pending** **COURSE CORRECTING KOOPMAN REPRESENTATIONS**

*Mahan Fathi, Clement Gehring, Jonathan Pilault, David Kanaa, Pierre-Luc Bacon, Ross Goroshin*

## EDUCATION

**M.Sc. in Computer Science** Jan'21 – Present

*Université de Montréal & Mila*

**B.Sc. in Mechanical Engineering** Sep'13 – Jul'17

*Sharif University of Technology*

**NODET: High School** Sep'09 – Jun'13

*National Organization for Development of Exceptional Talents, Mathematics and Physics*

## TECHNOLOGIES

### Frameworks and Codebases

- JAX, TensorFlow, PyTorch
- Flax, Haiku, Optax
- T5X
- Acme, BRAX, Dopamine, RLax
- XM, Google Infrastructure

### Everything Data

- Apache Spark, SparkSQL, Apache Kafka
- Apache Flink, Apache Beam
- HDFS, YARN
- Redis, MongoDB
- PostgreSQL, MySQL

### Main Programming Languages

• C/C++ • Python • JS • Java • Lua • SQL

### Miscellaneous

- 10+ years experience with Linux systems
- Emacs, Arch Linux
- 🇮🇷 English, Farsi

## HONORS & AWARDS

Bourse D'excellence DIRO & MSc Tuition Exemption Scholarship (Bourse C)

Fully Funded Admission to

**Mila/UdeM, ETH, UBC, McGill, Aalto**

Awarded membership to the *National Elites Foundation*

Silver Medalist at 25th National Physics Olympiad

## RESEARCH INTERESTS

- Unsupervised Learning
- Long-Range Sequence Modeling
- Large Language Modeling
- Sequential Decision Making & RL
- Really Large Scale AND Toy Experiments
- Inference-time Algorithms