Moein Khajehnejad

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About Me

Applied scientist and postdoctoral researcher specializing in AI, Deep Learning, Graph Neural Networks, and Foundation Models in Neuroscience. Experienced in scalable ML pipelines, reinforcement learning, multimodal AI, and large-scale fMRI analysis. Passionate about developing AI-driven solutions for complex data-driven challenges. Strong expertise in Transformers, PyTorch, Graph-based ML, and Large-Scale Data Processing with extensive experience in machine learning and AI research among prestigious teams in 6 different countries.

Work Experience

Cortical Labs   **Melbourne**
Applied Scientist   *2022 – Present*
- Developed **deep reinforcement learning** algorithms to analyze biological neurons vs AI.
- Studied the neural correlates of **consciousness and intelligence** in vitro.
- Built **scalable ML pipelines** for neural activity prediction and decision modeling.
- Applied **graph-based deep learning** to extract insights from multi-electrode array data.

Max Planck Institute for Software Systems (MPI-SWS)   **Germany**
Machine Learning Researcher   *Jan 2019 – May 2019*
- Mathematically solved problem of **optimal decision-making** under strategic behaviour using real credit card data.
- Designed optimal decision-making models using **probabilistic ML** and **causal inference**.
- Applied **game-theoretic approach** on **large-scale datasets** for **fairness analysis**.

statNLP @ SUTD-MIT   **Singapore**
Machine Learning Intern   *Jul 2016 – Oct 2016*
- Developed low-dimensional **network embedding** methods for large-scale social networks.
- Applied **NLP inspired algorithms** to improve representation learning in graphs.

LSIR @ EPFL   **Switzerland**
Information Systems Research Intern   *Jan 2016 – May 2016*
- Significantly modified the accuracy of several state-of-the-art deep learning algorithms in **word embedding**.

SyMLab @ HKUST   **Hong Kong**
Machine Learning Intern   *Jul 2015 – Oct 2015*
- Introduced a novel measure for mean first traverse distance on **complex networks**.

Technical Skills

Programming: Python, R, Matlab, Bash

Machine Learning: PyTorch, TensorFlow, Scikit-learn, Hugging Face

Deep Learning & AI: Spatio-temporal Transformers, Graph Transformers, ViT, Graph Neural Networks

Multimodal Representation Learning: Contrastive Learning (e.g. CLIP), Cross-Modal Attention, Perceiver Models, MoE (Mixture of Experts)

Visualization & Analysis: Matplotlib, Seaborn, Plotly, Tableau

Data Science & Statistics: Bayesian Inference, Causal Inference, Probabilistic ML, Graph Based ML, Network Science and Graph Theory, Feature Engineering, Time Series Analysis

Selected Publications (For a full list see Google Scholar)

Preprint 2024: *TAVRNN: Temporal Attention-enhanced Variational Graph RNN Captures Neural Dynamics And Behavior* [link]

NeurIPS 2023: InfoCog, GenBio, RealML, & NeurReps (Oral): *On Complex Network Dynamics of an In-Vitro Neuronal System during Rest and Gameplay* [link]

NeurIPS 2022: DeepRL, MemARI, & LMRL: *Biological Neurons vs Deep Reinforcement Learning: Sample efficiency in a simulated game-world* [link]

ICML 2022 (Spotlight): *Neural Network Poisson Models for Behavioural and Neural Spike Train Data* [link]

AAAI 2022: *CrossWalk: Fairness-enhanced Node Representation Learning* [link]

IJCAI 2020: *Adversarial Graph Embeddings for Fair Influence Maximization over Social Networks* [link]

NeurIPS 2019: Human-Centric ML: *Optimal Decision Making Under Strategic Behavior* [link]

Education

Monash University - Monash Data Future Institute   **Melbourne**
Postdoctoral Research Fellow   *2023 - Present*

Monash University - Department of Data Science and AI   **Melbourne**
Ph.D. in Computer Science   *2019 - 2023*

Sharif University of Technology   **Tehran**
B.Sc. in Computer Science and Electrical Engineering   *2011 - 2016*

Honors & Awards

○ Selected for **CIFAR Neuroscience of Consciousness Winter School, 2024** - 42 selected globally

○ Best Reviewer Award – **Learning on Graphs (LoG) Conference 2022**

○ Travel Award – **NeurIPS 2019, ICML 2022, NetSciX 2022, CNS* 2024**

○ Accepted to **Machine Learning Summer School (MLSS 2020)** - acceptance rate of 13.8%

○ Accepted to **NETHIKE Summer School by ETHZürich, 2022** - 17 accepted globally

○ Summer Internship Grant:
  Max Planck Institute for Software Systems **(MPI-SWS)**, 2019
  Singapore University of Technology and Design **(SUTD-MIT)**, 2018
  Swiss Federal Institute of Technology Lausanne **(EPFL)**, 2016
  Hong Kong University of Science and Technology **(HKUST)**, 2015

○ Full attendance scholarship, **National University of Singapore (NUS) Workshop** on Contemporary Research in Computer Science and Information Systems, 2016.

Professional Experience

○ **Organizer:** NeuroAI Workshop @ NeurIPS 2024 (1,400+ attendees)

○ **Conference Reviewer:** ICML 2022-2025, NeurIPS 2023-2024, ACM FAccT 2022, ICLR 2021, IJCAI 2020

○ **Journal Reviewer:** IEEE Transactions on Neural Networks and Learning Systems 2023 (IEEE TNNLS), Journal of Future Generation Computer Systems 2020 (FGCS)

○ **Mentorship:** Impact Scholars Program @ NeuroMatch Academy