Mohammad Hossein Amani

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INTERESTS
- Symbolic representation learning
- Reinforcement learning
- Unsupervised learning of reasoning and planning

EDUCATION

Ph.D. Computer Science — Sep 2022 – Present
École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

B.Sc. Electrical Engineering and Physics (double major) — Sep 2017 – Jun 2022
Sharif University of Technology, Tehran, Iran

PUBLICATIONS

- Symbolic Autoencoding with Straight-through Gradient Estimators
MHA, Nicolas Mario Baldwin, Amin Mansouri, Martin Josifoski, Maxime Peyrard, and Robert West
Preprint Arxiv'24

- Sharp Asymptotics on the Compression of Two-layer Neural Networks
MHA, Simone Bombari, Marco Mondelli, Rattana Pukdee, and Stefano Rini
Proc. IEEE Information Theory Workshop (ITW'22)

- Memorization and Optimization in Deep Neural Networks with Minimum Over-parameterization
Simone Bombari, **MHA**, Marco Mondelli
Proc. of the Conference on Neural Information Processing Systems (NeurIPS'22)

AWARDS & SCHOLARSHIPS

- **EPFL doctoral school Ph.D. fellowship** — 2022
- **Ranked 7th among 176 Electrical Engineering students** — 2021
- **Silver medal in national Physics Olympiad** — 2016
  Exams included classical mechanics, electrodynamics, statistical physics, and basic solid state physics.
- **Ranked 370 in national university entrance exam** — 2017
  Ranked 370 out of 140000 students in national university entrance exam, Physics and Mathematics Discipline.

RESEARCH EXPERIENCES

- **Self-supervised symbolic representation learning with discrete autoencoders** — Sep 2022 – Present
  Supervisor: Professor Robert West
  Ecole polytechnique fédérale de Lausanne (EPFL)

- **Maximum distance-two independent-set on random graphs** — Feb 2022 – Jun 2022
  Supervisor: Professor Lenka Zdeborova
  Ecole polytechnique fédérale de Lausanne (EPFL)

- **Minimal overparameterization guarantees in the neural tangent kernel** — Apr 2021 – Feb 2022
  Supervisor: Professor Marco Mondelli
  Institute of science and technology, IST Austria

- **Foundational limits of neural network compression** — Feb 2021 – Feb 2022
  Supervisor: Professor Marco Mondelli
  Institute of science and technology, IST Austria

- **Representation limits of classical and quantum graphical models** — Jul 2019 – Sep 2019
  Supervisor: Professor Pascal Olivier Vontobel
  The Chinese university of Hong Kong (CUHK)

TEACHING

Teaching assistant at EPFL for the following courses:

- Probability and Statistics   Spring 2023
- Applied Data Analysis   Fall 2023

Teaching assistant at Sharif University of Technology for the following courses:

- High-dimensional probabilistic analysis   Spring 2021
- Signals and systems   Spring 2020
- Probability and statistics   Fall 2019
- Introduction to programming (C and C++)   Spring 2018

Teacher at Allame Helli High School   Jun 2017 – Jun 2020

- I taught electromagnetism, statistical mechanics, calculus, and thermodynamics to students preparing for Physics Olympiad.

SKILLS

- TensorFlow, Pytorch
- Python, Scikit-learn
- MATLAB
- C++
- LaTeX