

ERFAN MIRZAEI

ELLIS Ph.D. Student in Machine Learning

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EDUCATION

Ph.D. in Applied Mathematics

Istituto Italiano di Tecnologia & École Polytechnique & Università di Genova Nov 2023 – Present

Genoa, Italy / Paris, France

- The overarching goal is to explain why and how modern machine learning algorithms generalize by leveraging concentration inequalities, PAC-Bayes framework, and information theory.
- Advisors: [Massimiliano Pontil](#), [Karim Lounici](#).

M.Sc. in Artificial Intelligence and Robotics

University of Tehran Nov 2020 – June 2023

Tehran, Iran

- GPA: 19.49/20 (4.0/4.0). Ranked 2nd in cohort. Courses: ML, RL, DL, Information Theory, Neuroscience Fundamentals, Distributed Optimization, Game Theory.

B.Sc. in Mechanical Engineering

University of Tehran Sep 2016 – Sep 2020

Tehran, Iran

- GPA: 17.34/20 (3.66/4.0). Top 15% of undergraduate students.
- Thesis: Controlling Temperature Using RL in Smart Environments.

PUBLICATIONS & PRE-PRINTS

Symbols: † denotes equal contribution.

1. A. Maurer, **E. Mirzaei**, M. Pontil. *Generalization of Gibbs and Langevin Monte Carlo Algorithms in the Interpolation Regime*. Under Review, 2025. [[arXiv](#)]
2. G. Turri, G. Pacreau, G. Meanti, T. Devergne, D. Ordonez, **E. Mirzaei**, et al. *kooplearn: A Scikit-Learn Compatible Library of Algorithms for Evolution Operator Learning*. Under Review, 2025. [[arXiv](#)] [[Code](#)]
3. **E. Mirzaei**, A. Maurer, V. Kostic, M. Pontil. *An Empirical Bernstein Inequality for Dependent Data in Hilbert Spaces and Applications*. AISTATS, 2025. [[arXiv](#)] [[Code](#)]
4. **E. Mirzaei**, A. Tavakoli, S.P. Shariatpanahi, R. Hosseini, M.N. Ahmadabadi. *Exploiting Expertise of Non-Expert and Diverse Agents in Social Bandit Learning: A Free Energy Approach*. IEEE Transactions on Cognitive and Developmental Systems (TCDS), 2025. [[PDF](#)]
5. H. Ghaemi†, **E. Mirzaei**†, M. Nouri†, S.R. Kheradpisheh. *BioLCNet: Reward-modulated Locally Connected Spiking Neural Networks*. ACAIN, 2022. [[arXiv](#)] [[Code](#)]

AWARDS, RECOGNITIONS & MEMBERSHIPS

EMS Membership

European Mathematical Society (EMS) Feb 2026 – Present

Europe

- Active member supporting the advancement of mathematics and related research across Europe.

INdAM Membership (Real Analysis, Measure Theory & Probability)

Istituto Nazionale di Alta Matematica (INdAM) Jan 2026

Italy

- National network of mathematical excellence supporting research projects and scientific mobility.

3rd Place, National Brain-Computer Interface Competition

National Brain Mapping Laboratory (NBML) June 2022

Tehran, Iran

- Ranked 3rd out of 20 teams in the 5th national competition focusing on auditory attention.

Winner of Supporter Foundation of the University of Tehran Scholarship (2×)
University of Tehran

Oct 2016/17
Tehran, Iran

- Recognized for outstanding academic performance

EXPERIENCE

Teaching Assistant (Comp. Neuroscience & NeuroAI)
Neuromatch Academy

Part-time contract - Jul 2022 & 2025
Remote

- Instructed and mentored students through course material and final projects.

Teaching Assistant
University of Tehran

2021 – 2022
Tehran, Iran

- Courses: Information Theory, Reinforcement Learning, Distributed Optimization.

Python Instructor (Volunteer)
KaarYar

Oct 2022-2025
Remote

- A social start-up providing education to underprivileged communities.

Undergraduate Research Assistant
School of Mechanical Engineering, University of Tehran

Jul 2020 - Sep 2020
Tehran, Iran

EVENTS

Mathematical Aspects of Data Science Summer School, EPFL
Presented [3]

Sep 2025
Lausanne, Switzerland

Learning and Optimization in High Dimensions Workshop, Bocconi University
Presented [3]

Jul 2025
Milan, Italy

Theoretical Foundations of Machine Learning
MaLGa Lab, University of Genoa

Jun 2025
Genoa, Italy

New Trends in Statistical Learning
Edition V

Jun 2025
Porquerolles, France

Artificial Intelligence and Statistics (AISTATS) Conference
Presented [3]

May 2025
Phuket, Thailand

ELLIS Doctoral Symposium (EDS2024)
ELLIS Society

Aug 2024
Paris, France

Data-driven Dynamical Systems Summer School
University of Bremen

Jul 2024
Bremen, Germany

International Conference on Statistics and Related Fields
in honor of Vladimir Koltchinskii

Jun 2024
Bertinoro, Italy

SKILLS

Languages

English (C1), Italian (A2), Farsi/Persian (Native)

Programming

Python (PyTorch, Tensorflow, Scikit-Learn), MATLAB, R

Miscellaneous

LaTeX, Git, Slurm (HPC)