

ERFAN MIRZAEI

ELLIS Ph.D. Student in Machine Learning

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EDUCATION

Ph.D. in Applied Mathematics

Nov 2023 – Present

Istituto Italiano di Tecnologia & École Polytechnique & Università di Genova 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

Nov 2020 – June 2023

University of Tehran

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

Sep 2016 – Sep 2020

University of Tehran

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. Paireau, 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

INdAM Membership (Real Analysis, Measure Theory & Probability)

Jan 2026

Istituto Nazionale di Alta Matematica (INdAM)

Italy

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

3rd Place, National Brain-Computer Interface Competition

June 2022

National Brain Mapping Laboratory (NBML)

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

National Graduate Entrance Exam Top Rank

National Organization of Educational Testing

Aug 2020

Iran

- Ranked 27th (Top 0.1%) nationwide in Computer Science.

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

L^AT_EX, Git, Slurm (HPC)