Amirhossein Bagheri

2001 | amirhossein.bagheri.001@gmail.com | https://ahbagheri01.github.io/ | ahbagheri01 | Milan, Italy

Education

Politecnico di Milano — *Milano-Italy*

M.Sc in **Computer Science & Engineering** — Sept. 2025 - Present

Sharif University of Technology — *Tehran-Iran*

B.Sc in **Computer Engineering** — Sept. 2019 - July. 2024

GPA: $19.58/20 - 3.98/4$, GPA Major: $19.82/20 - 4/4$

Thesis: Enhancing lesion detection (segmentation) in breast mammograms through semi-supervised learning

Qoddusi High School — *Qom-Iran*

Diploma in **Mathematics and Physics** — Sept. 2016 - Jun. 2019

GPA: $19.71/20$

Research Interests

- Machine Learning Theory
- High Dimensional Statistical Learning
- Optimization
- Reinforcement Learning

Publications

- Seyed Alireza Javid, Amirhossein Bagheri, and Nuria Gonzalez-Prelcic. Enhancing Diffusion Model Guidance through Calibration and Regularization. NeurIPS 2025 Workshop on Structured Probabilistic Inference & Generative Modeling, 2025
- Amirhossein Bagheri, Radmehr Karimian, and Gholamali Aminian. f-SCRUB: Unbounded machine unlearning via f-divergences. In ICLR 2025 Workshop on Navigating and Addressing Data Problems for Foundation Models, 2025
- Gholamali Aminian, Amirhossien Bagheri, Mahyar JafariNodeh, Radmehr Karimian, and Mohammad-Hossein Yassaee. Robust semi-supervised learning via f-divergence and α-rényi divergence. In 2024 IEEE International Symposium on Information Theory (ISIT), 2024
- Gholamali Aminian, Amirhossein Bagheri, Radmehr Karimian, Mahyar JafariNodeh, and Mohammad Hossein Yassaee. Semi-supervised learning under self-training via f-divergence. In The Second Tiny Papers Track at ICLR 2024, 2024

Achievements

Sept. 2025	**Ministry of Foreign Affairs of the Italian government**: MAECI Scholarship
Sept. 2024	**University**: Ranked 5^{th} out of 190 undergraduate students
June. 2019	**Nationwide Universities Entrance Exam (Konkur)**: Ranked 31^{st} out of $160,000$ participants
June. 2016	**Contest**: Affiliated with the National Organization for the Development of Exceptional Talents (NODET)

Research Experiences

F-SCRUB

The Alan Turing Institute — Nov. 2024 - Feb. 2025

- Introduced a novel framework based on f-divergences with the SCRUB framework for machine unlearning.
- Conducted comprehensive experiments investigating different combinations of f-divergences in F-SCRUB.
- Under the supervision of Dr. Gholamali Aminian.

Federated Unlearning

The Alan Turing Institute — Feb. 2025 - Present

- Working on unlearning in a federated setup, both from a theoretical perspective and practically in different scenarios.
- Under the supervision of Dr. Gholamali Aminian.

Robust Semi-Supervised Learning via f-Divergence

Sharif University of Technology & The Alan Turing Institute — Sept. 2023 - May 2024

- Proposed novel risk functions inspired by different divergences, including f-divergences and α-Rényi divergence.
- Provided an upper bound on ideal performance for metric distance.
- Proposed novel regularization terms inspired by f-divergences and α-Rényi divergence.
- Provided an empirical analysis of our empirical risk functions and regularizers under different scenarios and datasets to show their performance under noisy pseudo-labels.
- Under the supervision of Dr. Gholamali Aminian and Prof. Mohammad Hossein Yassaee.

Enhancing Lesion Detection (Segmentation) in Breast Mammograms Through Semi-Supervised Learning (B.Sc. Thesis)

Sharif University of Technology — Jan. 2023 - May 2024 (Defence: June 2024)

- Developed a weakly supervised labeling pipeline to generate masks for this massive amount of unlabeled data.
- Introduced a novel pipeline for labeling mammograms for lesion detection. This study is a thorough attempt to assess the effectiveness of different solutions for utilizing unlabeled data in lesion detection in mammograms.
- Under the supervision of Prof. Hamid R. Rabiee and PhD student Rassa Ghavami.

Highlight Courses (Graduate courses are indicated by †)

◇ Machine Learning †	19.3/20	◇ Design Algorithm	20/20
◇ High Dimensional Probability †	18.6/20	◇ Linear Algebra	20/20
◇ ITSL[1] †	18.4/20	◇ Advanced Information Retrieval	20/20
◇ Artificial Intelligence	20/20	◇ Discrete Structure (math)	19.6/20
◇ Engineering Probability and Statistics	20/20	◇ Stochastic Process †	19/20
◇ Introduction to Bio-Informatics	20/20	◇ Deep Learning †	Audited

Work Experience

Machine Learning Engineer

Qom

RSO Company — Oct. 2024 - Oct. 2025

- Deploy large language models (LLMs) in scalable production environments, optimizing for performance and reliability across distributed systems.
- Conduct in-depth data analysis for machine learning projects, focusing on processing and extracting insights from large-scale graph datasets.
- Develop and maintain MLOps pipelines, automating model training, deployment, and monitoring to enhance operational efficiency.
- Collaborate with cross-functional teams to integrate machine learning solutions into existing infrastructures and products, ensuring seamless scalability.

Lung X-ray Segmentation (Research Intern)

CommaMed Startup (Science and Technology Park, Sharif University of Technology) — June 2022 - Sept. 2022

- Employed deep neural networks for lung segmentation in X-ray images based on ResUNet as part of the image (X-ray) processing pipeline to generate a mask for unlabeled data.
- Adapted and evaluated multiple semi-supervised segmentation models and methods to make the model more robust to distribution shift (pictures from other devices) using massive amounts of unlabeled data.

Teaching Experiences (Graduate courses are indicated by †)

[1] Information-Theoretic Methods in Learning and Statistics

Sharif University of Technology [2]

- ◇ Differential Privacy † — Fall 2023
  Project Supervisor
- ◇ Probability and Statistics — Fall 2022, Fall 2023
  Design and Grade assignments
- ◇ Artificial Intelligence — Fall 2022, Spring 2022
  Design and Grade assignments, Hold TA sessions
- ◇ Signals and Systems — Fall 2022, Fall 2023
  Head TA
- ◇ Linear Algebra — Fall 2023, Spring 2022
  Project Supervisor, Design and Grade assignments
- ◇ Design Algorithm — Fall 2022
  Design and Grade assignments, Hold TA sessions

Technical Skills

Programming	Python, C++, C, Matlab, PostgreSQL, LaTeX, R, Java , Verilog
Frameworks	Langchain, TGI, VLLM, LLamaCPP, SQL Alchemy, Neo4j, Git, Wireshark, Quartus, Simulink, ModelSim
Devops and Operational Systems	Linux, Docker
Machine Learning Libraries	Numpy, Pandas, Scikit-Learn, Matplotlib, MLflow, Seaborn
Deep Learning Libraries	PyTorch, Keras, TensorFlow
Languages	Persian (Native), English (Proficient): Toefl score 104 (R28, L28, S25, W23)

Related Course Projects (Graduate courses are indicated by †)

High Dimensional Analysis †
Theoretical analysis of Adversarial Learning (Survey) — Spring 2023

Information Theory, Statistics, Learning †
Application of Tilted Losses (Alpha-Reini Divergence) in Robust Learning — Fall 2022

Machine Learning †
Dimension Reduction + SVMs + Transfer Learning + Recommendation Systems Model — Fall 2021

Artificial Intelligence
Variety subjects: A*, Genetic, CSP, Mini-MAx, Bayesian inference and Gibbs sampling, Regression, Perceptron, DNN, DCN, Decision tree, HMM, RL — Spring 2021

Advanced Information Retrieval
Classification + Clustering + Ranking + Advance Search of 2k Articles with BERT — Spring 2022

Introduction to Bio-Informatics
Micro array data analysis — Fall 2022

Data and Network Security
Implementation of a simplified version of Signal Messenger — Spring 2023

Compiler Design
C-minus Compiler — Fall 2021

Computer Network
Implementation of a Streaming Application using socket programming — Spring 2022

Operational Systems
Implementation of Semaphore, Scheduler, File system of Pintos — Spring 2022

[2] All teaching assistance were voluntary work