



EHSAN LARI, PH.D.

Trondheim, Norway

☎ +47 92566819 ✉ ehsanl@alumni.ntnu.no  www.linkedin.com/in/ehsanlari/  ehsan-lari.github.io

Professional Experience

PhD Researcher

January 2020 – May 2025

Norwegian University of Science and Technology (NTNU)

Trondheim, Norway

- Developed robust algorithms using Python and MATLAB for federated learning, distributed NMF, and consensus algorithms, enhancing resilience to noise and privacy in large-scale signal processing and machine learning systems.
- Authored 7 peer-reviewed publications in top-tier venues (IEEE TSIPN, Elsevier SP, ICASSP, SSP, APSIPA, EUSIPCO) on distributed optimization and privacy-preserving data systems, advancing efficient and secure technology solutions.
- Served as a teaching assistant for three years, providing valuable support in the courses of Digital Signal Processing (3x), Estimation, Detection and Classification, and Design of Integrated Circuits (3x).
- Mentored students in research projects, leveraging Python and MATLAB to bridge data science and engineering through distributed system integration and algorithm development.

Assistant Professor in Electronic Systems

August 2022 – December 2022

Norwegian University of Science and Technology (NTNU)

Trondheim, Norway

- Delivered lectures on electronic system design, supporting over 200 master's students toward their final project.

Education

Norwegian University of Science and Technology (NTNU)

January 2020 – March 2024

Doctor of Philosophy (PhD) — Signal Processing and Statistical Learning

Trondheim, Norway

Amirkabir University of Technology (Tehran Polytechnic)

September 2016 – December 2018

Master of Science (MSc) — Electrical Engineering

Tehran, Iran

Amirkabir University of Technology (Tehran Polytechnic)

September 2012 – September 2016

Bachelor of Science (BSc) — Electrical Engineering (Double-Major)

Tehran, Iran

Major Achievements

- **NTNU, Norway:** Offered an assistant professor position mid-PhD, recognizing exceptional research and teaching integrity in machine learning and signal processing.
- **McGill University, Canada:** PhD offer + McGill Engineering International Tuition Award (MEITA)

Skills

- **Programming Languages:** Python (Scikit-Learn, PyTorch, NumPy, Pandas), MATLAB, SQL
- **Software & Tools:** Cloud Platforms (Microsoft Azure), Git
- **Technologies:** Machine Learning, Anomaly Detection, Time-Series Forecasting, Data Analytics
- **Soft Skills:** Problem-Solving, Communication, Cross-Functional Collaboration, Teamwork, Adaptability

Projects and Outputs

Uncertainty Quantification in Federated Machine Learning

May 2025 – Present

- Developed methods for uncertainty quantification in federated online learning, resulting in more robust and trustworthy learning algorithms.
- Plan to submit findings to IEEE TSP (Q1 journal).

Resilience in Online Machine Learning

April 2022 – August 2024

- Developed the PSO-Fed algorithm for online federated learning, enabling privacy-preserving model training on distributed streaming data with reduced communication overhead.
- Optimized PSO-Fed's robustness by identifying a non-trivial stepsize, outperforming state-of-the-art federated learning algorithms in resilience to malicious client attacks.
- Published findings in IEEE TSIPN (Q1 journal) and presented at IEEE ICASSP, a leading signal processing conference, demonstrating PSO-Fed's superior performance via extensive simulations.

Noise-Robust and Resource-Efficient Machine Learning

April 2023 – February 2025

- Developed a novel federated learning algorithm to enhance robustness to communication noise while minimizing client-server communication load.
- Enhanced performance by eliminating dual variables and enabling continuous local model updates, improving resilience to noisy links.
- Published in Elsevier Signal Processing (Q1 journal) and presented at IEEE SSP and IEEE APSIPA, showcasing significant robustness and efficiency gains.

Privacy-Preserving Nonnegative Matrix Factorization

January 2024 – September 2024

- Developed a privacy-preserving algorithm for fully-distributed nonnegative matrix factorization (NMF) to decompose large data matrices over ad-hoc networks.
- Implemented a decentralized approach to prevent raw data sharing among agents, ensuring robust privacy in distributed signal processing applications.
- Presented findings at EUSIPCO, a leading signal processing conference, showcasing the algorithm's applicability to privacy-sensitive machine learning tasks.

Distributed Maximum Consensus

February 2024 – September 2024

- Developed the RD-MC algorithm for distributed maximum consensus, enabling robust estimation of maximum values in multi-agent networks over noisy communication links.
- Enhanced robustness and efficiency by utilizing a single set of noise-corrupted estimates and applying moving averaging to local estimates.
- Presented results at EUSIPCO, a leading signal processing conference, showcasing the algorithm's effectiveness in noisy distributed environments.

Languages

- **Norwegian, Bokmål:** B1 Proficiency, **English:** Fluent, **Persian (Farsi):** Native