Reza Jahani

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Education

2025 - Present Ph.D. - Electrical Engineering — **NC State University** (GPA: 4.0/4.0)
2019 - 2024 B.Sc. - Electrical Engineering — **University of Tehran** (GPA: 3.92/4.0)

Work Experience

NC State University — Graduate Research Assistant Jan 2025 - Present

- Designing Decentralized Federated Learning (DFL) frameworks for mobile networks; 2 papers published in IEEE ICASSP and IEEE TCCN.
- Analyzed the impact of mobility on DFL convergence, performed theoretical analysis, and conducted large-scale simulations on Unix servers using Python and PyTorch.

Telecommunication Innovation Lab — Research Assistant July 2022 - Jan 2023

- Designed a CNN and Attention-based deep learning framework for direction of arrival estimation from RF signals, outperforming conventional methods (MUSIC, Beamforming) in accuracy and robustness. 1 paper published in Elsevier.

Projects

Deep Learning & Computer Vision

- Built Vision Transformer (ViT) from scratch on CIFAR-10 with positional embedding ablation and MetaFormer variant experiments.
- Implemented SimCLR and Barlow Twins for self-supervised representation learning on STL-10 with label-efficiency evaluation.
- Developed and compared MLPs and ConvNets on CIFAR-10 with regularization, data augmentation, and label-noise robustness studies.
- Built deep learning frameworks for surface detection, facial emotion recognition (FER2013), and real-time object detection (YOLOv3).

Advanced Signal Processing

- Solved advanced signal processing and blind source separation problems.
- Implemented Independent Component Analysis, Dictionary Learning, Sparse Recovery, CSP filters.
- Audio Processing, EEG Signal Processing, etc. using MATLAB and signal processing toolbox.

Wireless Communications & Optimization

- LTE/5G physical layer simulations: fading channels, MIMO diversity, CQI/RI feedback, OFDM, channel estimation, and 5G NR waveform generation.
- UAV trajectory optimization for data collection in LTE/5G networks using MILP-based scheduling (AERPAW AADM Challenge).
- Implementation of optimization algorithms (Gradient Descent, Quasi-Newton, Genetic Algorithm) and digital modulation schemes.

Skills

Programming	Python, MATLAB, C, C++.
Knowledge/ Tools	Linux, Anaconda, Optimization, ML/ Deep Learning, Signal Processing.
Libraries	PyTorch, Keras, Numpy, Pandas, Scikit-learn, sklearn.