Fatemeh Doudi

Ph.D. Student in Electrical Engineering
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LinkedIn GitHub Google Scholar Personal Website

Education

Ph.D. in Computer Engineering
Texas A&M University Jan 2023 – Present
Advisor: Prof. Dileep Kalathil
GPA: 4.0/4.0

M.Sc. in Electrical Engineering
Sharif University of Technology Oct 2020 – Dec 2022
Advisors: Prof. F. Ashtiani, Prof. M. A. Maddah-Ali
GPA: 17.78/20

B.Sc. in Electrical Engineering
Sharif University of Technology Sep 2015 – Dec 2019
GPA: 16.77/20

Research Interest

- **Generative AI:** Diffusion Models, Transformer Models, State-space models
- **Machine learning:** Deep Learning, Reinforcement Learning

Projects and Publications

Inference-Time Multi-Preference Alignment for Diffusion Models
Texas A&M University Dec. 2024 – May 2025
Supervisors: Prof. Dileep Kalathil, Prof. P. R. Kumar
Submitted to ICLR 2026

- Developed Diffusion Blend, an inference-time alignment framework that blends multiple reward preferences while controlling KL divergence.
- Achieved fine-tuned-level performance without retraining, reducing alignment compute cost by ∼40%.
- **Gained experience** in diffusion model theory, RL-based fine-tuning of diffusion models, and implementing baseline inference search and gradient guidance methods for diffusion models.

Time Series Prediction in Electric Power Systems using Deep State Space Model
Texas A&M University July. 2024 – Dec. 2024
Supervisors: Prof. Dileep Kalathil, Prof. Le Xie
Submitted to IEEE Transactions on Power Systems

- Proposed PowerMamba, a deep state space model for time series prediction in electric grids.
- Demonstrated 7% improvement in accuracy with 43% fewer parameters vs. baselines.
- **Gained experience** in state space models, applying Mamba for time series forecasting, network architecture design, and implementing transformer-based baseline models.

Exploring Large Language Models in the Electric Energy Sector
Texas A&M University Jan 2024 – Mar 2024
Supervisors: Prof. Dileep Kalathil, Prof. Le Xie
Published in Joule

- Investigated the integration of LLMs for data analysis and decision support in power grid operations.
- **Gained experience** in retrieval-augmented generation (RAG) and applying multimodal LLMs for fault detection and condition analysis in electric grids.

Skills

- **Programming:** Python, MATLAB, C/C++
- **Methodologies:** Machine Learning, Deep Learning, Generative Models, Queueing Theory

Relevent Courses

- Machine Learning, Deep Learning, Reinforcement Learning, Bandit Algorithm, Computer Vision
- Convex Optimization, Advanced Optimization, Analysis of Algorithm
- Stochastic Systems, Game Theory, Queuing Theory

Achievements and Awards

- ECEN Merit Fellowship, Texas A&M University
- Ranked 4th in M.Sc. National Entrance Exam (20,000 participants)
- Ranked 57th in B.Sc. National Entrance Exam (180,000 participants)