Emir Ceyani

PhD Candidate in Electrical & Computer Engineering, University of Southern California
323-975-0657 ceyani@usc.edu linkedin.com/in/emir-ceyani ceyani.io

Research Interests

- **Federated Graph Learning:** Fundamentals of training graph ML models in federated settings
- **Uncertainty Quantification(UQ) for Graphs:** Rigorous UQ methods for graph-structured data.
- **AI For Science:** Drug discovery and spatiotemporal forecasting.
- **Federated Statistical Inference:** Extending statistical inference methods for federated and non-IID data.
- **Federated Large Language Models:** Efficient and private training of LLMs in federated settings.

Education

University of Southern California, PhD in Electrical & Computer Engineering — **Jan 2021 – Dec 2025**
Thesis: Federated Learning and Inference over graphs. Advisor: Salman Avestimehr — *California, United States*

Bilkent University, MSc in Electrical Engineering — **Jun 2018 – Dec 2020**
Thesis: Spatiotemporal Forecasting over Graphs with Deep Learning — *Ankara, Turkiye*

Bilkent University, BSc in Electrical Engineering — **Sep 2013 – Jun 2018**
Thesis: Autonomous Vehicle Applications, Advisor: Sinan Gezici — *Ankara, Turkiye*

Research & Professional Experience

University of Southern California, Graduate Research Assistant — **Jan 2021 – Present**

- Formulating causal inference, Bayesian inference,and conformal prediction in federated settings.
- Developing personalized federated learning method for graph neural networks by adapting users' graph data.
- Helped in developing personalized federated MRI synthesis and reconstruction for the first time in the literature.
- Developed a serverless federated training of graph neural networks.
- Proposed training of graph neural networks in federated settings.

FedML Inc., Research Scientist Intern — **May 2022 – Aug 2022**

- Developed a black-box and learnable aggregation mechanism for federated learning that is optimal for given set of users.
- Developed a secure & private data sharing and federated platform for graph neural networks tailored for recommendation systems and drug discovert. aggregation mechanism for federated learning that is optimal for given set of users.

Turkcell Technologies, Research & Development Engineer — **Oct 2018 - Dec 2020**

- Developed and deployed a spatio-temporal forecasting algorithm with convolutional LSTM models.

Selected Publications (Google Scholar)

- Dalmaz et al., Personalized, Federated, And Unified MRI Contrast Synthesis, IEEE ISBI 2023
- Elmas et al., Federated Learning of Generative Image Priors for MRI Reconstruction, in IEEE TMI, July 2023.
- He et al. SpreadGNN: Decentralized multi-task federated learning for graph neural networks on molecular data. AAAI 2022.
- He, et al. "FedGraphNN: A federated learning system and benchmark for graph neural networks. arXiv preprint, co-1st (2021).

Professional Service

- **Reviewer:** Federated Learning with Graph Data (FedGraph2022-2023), CrossFL-MLSYS'22, ICLR'24, NeurIPS'22-'23 (Main & Dataset and Benchmark Tracks), IEEE Transactions of Neural Networks and Learning Systems, IEEE Transactions of Big Data
- **Organizer & Technical Committee Member:** 1st & 2nd International Workshops on Federated Learning with Graph Data, Techincal Program Committee Member at the CrossFL Workshop, MLSYS2022
- **Summer Schools Attended**: LOGML'22 Summer School, ProbAI 2021 Summer School, PAISS Summer School'19, Deep—Bayes'19 Summer School
- **Teaching Assistant**: ProbAI 2021 Summer School

Technical Skills

Programming Languages: Python, Matlab, Java, C++, Julia
Developer Tools: LaTeX, VS Code, Jupyter, Inkscape
Technologies/Frameworks: Linux, PyTorch, PyTorch Geometric, TensorFlow, NumPy, Matplotlib, Pandas, Github

Hobbies

Playing bass guitar, Music production, Trading card games, Martial arts, Motorcycling