Ozgur Guldogan

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Research Interests

Fairness in machine learning, uncertainty quantification, conformal prediction, LLM inference, generative AI

Education

University of California, Santa Barbara — Santa Barbara, CA, USA
Ph.D. Electrical and Computer Engineering — *Sept. 2021 – Present*
M.Sc. Electrical and Computer Engineering — *Sept. 2021 – Dec. 2024*

- **Advisor:** Ramtin Pedarsani, Ph.D.
- **Concentration:** *Signal Processing & Communications*
- **Relevant Coursework:** Machine learning: a signal processing perspective, Theoretical ML, Ethics of ML, Geometric ML, Optimization, Game Theory
- **GPA:** 4.0/4.0

Bogazici University — Istanbul, TR
B.Sc. Electrical and Electronics Engineering — *Sept. 2015 – June 2021*
B.Sc. Mathematics — *Sept. 2017 – June 2021*

- **Specialization:** *Signal Processing & Communications*
- **GPA:** 3.96/4.0
- **Relevant Coursework:** Machine Learning, Real Analysis, Statistical Signal Analysis, Probability

Purdue University — West Lafayette, IN, US
Electrical and Computer Engineering, Exchange Program — *Jan. 2019 – May 2019*

- **GPA:** 4.0/4.0 | Exchange Student

Publications

[1] **O. Guldogan**, N. Sarna, Y. Li, M. Berger. "Counterfactually Fair Conformal Prediction", *Accepted to:* 29th International Conference on Artificial Intelligence and Statistics (AISTATS-2026) doi:arXiv:2510.08724

[2] **O. Guldogan**, J. Kunde, K. Lee, R. Pedarsani. "Multi-Bin Batching for Increasing LLM Inference Throughput", *Under Review*; doi:arXiv:2412.04504

[3] B. Puranik*, **O. Guldogan***, U. Madhow, R. Pedarsani. "Long-Term Fairness in Sequential Multi-Agent Selection with Positive Reinforcement", special issue on Information-Theoretic Methods for Trustworthy and Reliable ML, IEEE JSAIT; doi:10.1109/JSAIT.2024.3416078

[4] **O. Guldogan***, Y. Zeng*, J. Sohn, R. Pedarsani, K. Lee. "Equal Improvability: A New Fairness Notion Considering the Long-term Impact", 11th International Conference on Learning Representations (ICLR-2023) May 2023; doi:arXiv:2210.06732

Research Experience

Ramtin Pedarsani's Research Group, UC Santa Barbara — Santa Barbara, CA, USA
Graduate Student Researcher — *Sept. 2021 – Present*

Fairness in machine learning

- Developed a new fairness metric called Equal Improvability (EI), designed to promote long-term fairness in dynamic decision-making processes, such as college admissions and credit lending.
- Researched decision-making strategies in multi-agent systems, developing policies that ensure fairness and optimal performance in processes like admissions and hiring, while addressing long-term equity challenges.
- Skills: theoretical analysis, code development in Python with a focus on fairness and trustworthy AI.

LLM inference optimization

- Developed and evaluated a method to optimize LLM inference, improving throughput provably by grouping requests with similar execution times via queueing theory tools.

- Skills: queueing theoretical analysis, code development for LLM inference.

Conformal Prediction

- Exploring unsupervised calibration techniques for conformal prediction to enable valid coverage without labeled calibration data.
- Skills: statistical guarantees, calibration under covariate shift, algorithm design and implementation.

Work Experience

Munich Re CA, USA
Research Scientist Intern *June 2025 – Sept. 2025*
- Researched on fair uncertainty quantification methods, proposed a new method to achieve counterfactual fairness of conformal prediction sets.

Eatron Istanbul, Turkey
ADAS Software Engineer *Sept. 2020 – July 2021*
- Contributed to several projects for autonomous driving systems.

AugeLab Aug. 2020 – Sept. 2020
Computer Vision Intern *Istanbul, Turkey*
- Worked on object tracking in real time videos by using OpenCV tools and image processing algorithms.

Telemed MR Solutions July 2019 – Nov. 2019
Image Processing Intern *Istanbul, Turkey*
- Developed a 3D MR image linear registration tool with using Insight Toolkit.

Projects

Deep Learning for Ch. Est. and Signal Det. in OFDM Oct. 2020 – June 2021
Senior Thesis Project
Supervisor: Hakan Deliç, Ph.D.
- Designed a deep neural network for estimating channel coefficients and detecting signals in orthogonal frequency division multiplexing (OFDM) systems, demonstrating improved performance compared to traditional demodulation methods.

Teaching Experience

University of California, Santa Barbara Santa Barbara, CA, USA
Teaching Assistant *2023–Present*
- **ECE 130A Signal Analysis and Processing (Fall 2023, 2024, 2025)**
- **ECE 130B Signal Analysis and Processing (Spring 2023, 2024)**
  Holding office hours and sections, grading homeworks, and exams.

Honors and Services

- UC Regents Fellowship in Electrical and Computer Engineering *Sept. 2021*
- Reviewer for NeurIPS 2025 *Aug. 2025*
- Reviewer for ICLR 2025, 2026 *Oct. 2024*
- Reviewer for FAccT'24 *Jan. 2024*
- Reviewer for IEEE Transactions on Networking (ToN) *Aug. 2023*
- UCSB Outstanding ECE TA Award June 2023
- Turkish Governmental Excellence Scholarship *Sept. 2015 – June 2020*
- Ranked Top 0.01% among 2 million students in the national university entrance exam *June 2015*

Technical Skills

Technical Languages: Python, C/C++, Matlab, LaTeX, Git
Libraries: `pytorch, tensorflow, JAX, pandas, numpy, scikit-learn, hugging face`