

Education

<i>Doctor of Philosophy - Electrical and Computer Engineering</i>	2024-Present
Purdue University - The Elmore Family School of Electrical and Computer Engineering	Indiana, US
Advisor: Prof. Abolfazl Hashemi	
<i>Master of Science - Electrical and Electronics Engineering</i>	2021-2024
Bilkent University - Faculty of Engineering	Ankara, Turkey
Advisor: Prof. Süleyman Serdar Kozat	
<i>Bachelor of Science - Electrical and Electronics Engineering</i>	2017-2021
Middle East Technical University - Faculty of Engineering	Ankara, Turkey

Research Background & Interests

- **Optimization Theory:** Convergence analysis, variance-reduction methods, multi-objective optimization
- **LLM Training:** Pretraining optimization, adaptive training schedules
- **Trustworthy Deep Learning:** Robustness, fairness, memorization

Professional Experiences

Purdue University , <i>Research Assistant (Advisor: Prof. Abolfazl Hashemi)</i>	West Lafayette, IN
• <i>Stochastic Optimization</i>	Aug 2025 - Present
- Developed PASTA and SAUCE, two stochastic optimization frameworks for nonconvex learning under realistic noise assumptions, covering the unbounded variance under the Blum-Gladyshev noise. Established theoretical convergence guarantees and demonstrated their relevance to modern deep learning settings where classical bounded-variance assumptions fail. - Currently investigating the optimization and generalization behavior of deep neural networks, with a focus on sharpness-aware training dynamics and adaptive scheduling.	
• <i>Trustworthy Deep Learning</i>	Aug 2024 - Present
- Proposed a two-stage coreset selection algorithm with the dual purpose of eliminating spurious correlations and reducing dataset size. Deployed product achieved up to 27% improvement over standard ERM utilizing only 10% of the training data on benchmark datasets such as Waterbirds, CMNIST, MetaShift and UrbanCars, while also outperforming state-of-the-art invariant learning methods. - Currently studying the training dynamics of deep learning models, with a focus on how loss landscape sharpness interacts with common training interventions and influences memorization and generalization, particularly in out-of-distribution settings.	
Databoss Security & Analytics Inc. , <i>Data Scientist</i>	Ankara, Turkey
• <i>Hourly Wind Energy Prediction</i>	Jun 2023 - May 2024
- Predicted the hourly energy data of multiple wind turbines in Turkey and Europe, showing chaotic and nonstationary behavior in multiple regions. - Developed a large-scale ML framework consisting of various adaptive feature construction and selection methods with models such as deep-learning (NN, ConvLSTM), machine learning (LightGBM, RandomForest), statistical (SARIMAX) models and state-of-the-art ensembling techniques. The deployed product increased the short-term forecasting accuracy by an average of 21% and long-term forecasting accuracy by an average of 8%.	

- *Natural Gas Demand Prediction*

Aug 2021 - May 2023

- Predicted the daily data of international natural gas demand in Turkey, consisting of nonstationary multivariate time series from multiple sources.
- Developed a large-scale ML framework specifically tailored towards a certain customer profile, where the predictions are obtained for the given data based on key indicators that are automatically extracted from the data itself and/or the user-given side information data. The constructed framework was deployed to various natural gas production companies.

METU Center for Image Analysis (OGAM), Machine Learning Engineer

Ankara, Turkey

- *UAV Small Object Detection and Tracking*

Jun 2020 - Jul 2021

- Developed a [Python application](#) for real-time small target tracking by leveraging temporal data derived from the output of object detectors, with a superior performance over the widely-known YOLOv3 algorithm by **6%**.
- Constructed a novel multi-hypothesis tracking algorithm with an annotation tool for the semi-automatic correction of mislabeled UAV data. The deployed product decreased the total mislabeled data in various datasets by an average of **13%**.

Publications

Preprints

- [1] **A. Fazla**, E. Kaya, A. Upadhyay, A. Hashemi, “Lower Bounds and Proximally Anchored SGD for Non-Convex Minimization Under Unbounded Variance”, Under Review at NeurIPS 2026. 
- [2] A. Upadhyay, **A. Fazla**, A. Hashemi, “Beyond Bounded Variance: Variance-Reduced Normalized Methods for Nonconvex Optimization under Blum-Gladyshev Noise”, Under Review at NeurIPS 2026. 

Published

- [3] **A. Fazla**, A. Hashemi, “Mitigating Spurious Correlations with Memorization-Guided Dataset De-Biasing”, Uncertainty in Artificial Intelligence (UAI), 2026. 
- [4] S. F. Tekin, **A. Fazla**, S. S. Kozat, “Numerical Weather Forecasting using Convolutional-LSTM with Attention and Context Matcher Mechanisms”, IEEE Transactions on Geoscience and Remote Sensing, 2024.  
- [5] **A. Fazla**, M. E. Aydin, S. S. Kozat, “Time-Aware and Context-Sensitive Ensemble Learning for Sequential Data”, IEEE Transactions on Artificial Intelligence, 2023.  
- [6] M. E. Aydin, **A. Fazla**, S. S. Kozat, “Hybrid State Space-based Learning for Sequential Data Prediction with Joint Optimization”, arXiv:2309.10553, 2023.  
- [7] **A. Fazla**, M. E. Aydin, S. S. Kozat, “Joint Optimization of Linear and Nonlinear Models for Sequential Regression”, Digital Signal Processing, Elsevier, 2022.  
- [8] K. G. Ince, A. Köksal, **A. Fazla**, A. A. Alatan, “Semi-Automatic Annotation for Object Detection”, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, 2021, pp. 1233-1239. 

Academic Awards

Elmore Family School of Electrical and Computer Engineering, Purdue University 2024-2029

- Awarded the highly competitive and prestigious Elmore Fellowship Award for my graduate studies, given only to the most outstanding applicants.

Turk Telekom & Information and Communication Technologies Authority

2023-2024

- Awarded 5G and Beyond Joint Graduate Support Programme, a merit-based fellowship of monthly stipend during M.Sc.

- Awarded Directorate of Science Fellowships and Grant Programme, a merit-based monthly stipend and accommodation support during M.Sc.
- Received the **373rd** rank among 2M high school graduates in the University Entrance Examination.
- Received the **11th** rank among 0.2M university graduates in ALES (National GRE).

Academic Duties

Reviewer Duties

- **Conferences:** ICLR '25-'26, NIPS '26, AISTATS '26, AAAI '25
- **Journals:** IEEE TAI '25, IEEE IOT '24-25

Teaching Assistantship at Bilkent University, Electrical and Electronics Engineering

2021-2024

- EEE321 Signals and Systems, EEE202 Circuit Theory, MATH255 Probability and Statistics

Software Skills

- **Python:** Professional research and industrial experience based on machine learning. High knowledge and experience in libraries such as *PyTorch*, *Tensorflow*, *Pandas*, *Numpy* and *Scikit-Learn*. I have experience with Docker and Git via industrial projects.
- **MATLAB:** Professional research experience in signal processing and computer vision. Used for projects during courses, research and internships.
- **R:** Intermediate level experience, employed during research based on time-series forecasting using statistical models.
- **C/C++:** Intermediate experience in various course projects.

Languages

Turkish: Native

English: Conversationally Fluent [TOEFL IBT 108/120 (October 19, 2022)]