Berkay Guler

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Professional Summary

I'm a Machine Learning researcher who believes in creating positive impact through simple, elegant solutions to complex problems. Right now I focus on ML/AI for communications and networks, though I previously worked in computer vision and natural language processing. I'm driven by the idea that the best breakthroughs come from interdisciplinary collaboration. I try to approach challenges with stoic resilience while building inclusive environments where meaningful innovation can actually happen.

Experience

Graduate Student Researcher *(Part-time)* June 2024 – Present
UC Irvine, Center of Pervasive Communications and Computing (CPCC) Irvine CA, USA
- Developing foundation models for wireless channel representation using self-supervised learning approaches
- Created ContraWiMAE framework combining contrastive and masked autoencoder learning objectives
- Achieved **6 dB MSE reduction** in OFDM channel estimation compared to state-of-the-art models
- Research on data-driven wireless **channel representation**, **beamforming**, **CSI feedback**, **channel estimation** and **channel prediction**

Machine Learning Engineer *(Full-time)* Feb. – Sep. 2023
DataBoss Security & Analytics Ankara, Turkey
- Conducted research on **text summarization** and **text normalization** with **BERT**
- Developed **APIs** to host inference endpoints of text normalization and text summarization models
- Developed and deployed an **document-AI** pipeline for automatic information extraction from documents

Senior Year Project Engineer Sep. 2022 – May 2023
TUBITAK (Scientific and Technological Research Council of Turkey) Ankara, Turkey
- Worked on **catastrophic forgetting prevention strategies** for **continual learning** from live video streams
- Implemented **object tracking** and **object detection** algorithms on NVIDIA **edge AI** devices

Undergraduate Student Researcher Mar. 2022 – June 2023
ICON Lab, Bilkent University Ankara, Turkey
- Research on improving image classifier robustness with synthetic data from **diffusion probabilistic models**
- Worked on mitigating site class imbalance issues in MRI synthesis with **federated learning**

Machine Learning Research/Engineer Intern Aug. 2022 – Feb. 2023
Huawei R&D Center Istanbul, Turkey
- Decreased labeling costs of Address Parsing Module in Huawei Petal Maps by improving sample complexity with **active learning** on **Transformers**
- Developed a **Python** framework to mine brand names from the web for use in Huawei Petal Maps

Embedded AI Intern June 2021 – Sep. 2021
Baykar Technology Istanbul, Turkey
- Embedded **C/C++** programming for **ARM** microprocessors, focusing on reliable **CAN communication** in UAV systems

Technical Skills

Programming Languages: Python, MATLAB, C/C++, Java
Tools & Frameworks: Sionna, PyTorch, PyTorch Lightning, Hugging Face, JAX/Flax, Weights Biases,

TensorFlow, Scikit-learn, Ray, Optuna, Git, Docker, Linux, Bash, SQL, Pandas, NumPy, CuPy, LaTeX, OpenCV, FastAPI
Machine Learning & AI: Foundation Models, Self-Supervised Learning, Transformers, Vision Transformers (ViTs), CNNs, Generative Models (Diffusion, GANs, VAEs, Flow Models), Sequential Models (RNNs, LSTMs, GRUs), Contrastive Learning, Masked Autoencoders, Multi-Task Learning, Deep Reinforcement Learning, Classical ML
Wireless Communications: 5G/6G, OFDM, Massive MIMO, mmWave Communications, Multi-antenna Systems, Channel Estimation, CSI Feedback, Beamforming, Neural Networks for PHY
Languages: English (Fluent), Turkish (Native)

Education

University of California, Irvine Sept. 2023 – Dec 2027 (expected)
Ph.D. Student in Networked Systems Program, Computer Science Department Irvine, California
- Henry Samueli Endowed Fellow, research on Machine Learning for Wireless Communication Networks
- Advised by Prof. Hamid Jafarkhani

University of California, Irvine Sept. 2023 – June 2025
M.S. in Networked Systems Program, Computer Science Department, (GPA: 3.82/4.0) Irvine, California
- Research on Machine Learning for Wireless Communication Networks
- Advised by Prof. Hamid Jafarkhani

École Polytechnique Fédérale de Lausanne (EPFL) Feb. – Aug. 2022
Exchange Student in School of Computer and Communication Sciences Lausanne, Switzerland
- Advised by Prof. Touradj Ebrahimi on evaluation of deep learning-based deep fake detection methods

Bilkent University Sept. 2018 – June 2023
B.S. in Electrical Engineering, Summa Cum Laude (GPA: 3.82/4.0) Ankara, Turkey
- Full tuition waiver and stipend during the program

Awards & Honors

Henry Samueli Endowed Fellowship, UC Irvine 2023 – Present
Summa Cum Laude, Bilkent University 2023
Full Tuition Waiver and Stipend, Bilkent University 2018 – 2023

Publications

- B. Guler, G. Geraci, H. Jafarkhani, "A Multi-Task Foundation Model for Wireless Channel Representation Using Contrastive and Masked Autoencoder Learning," *IEEE Journal on Selected Areas in Communications (JSAC): Large AI Models for Future Wireless Communication Systems*, (under review) arXiv:2505.09160
- B. Guler, G. Geraci, H. Jafarkhani, "WiMAE: Wireless Channel Representation with Masked Autoencoder-based Foundation Model," *2025 Global Communications Conference (GlobeCom)*, Taipei, Taiwan (under review)
- B. Guler, H. Jafarkhani, "AdaFortiTran: An Adaptive Transformer Model for Robust OFDM Channel Estimation," *2025 International Conference on Communications (ICC)*, Montreal, Canada arXiv:2505.09076
- B. Guler, B. Aygun, A. Gerek and A. S. Gurel, "Deep Active Learning for Address Parsing Tasks with BERT," *2023 31st Signal Processing and Communications Applications Conference (SIU)*, Istanbul, Turkey

Selected Coursework

Advanced coursework in: Machine Learning (Deep Generative Models, Introduction to Machine Learning, Image Analysis), Communications (Digital Communications I II, Error Correcting Codes, Digital

Signal Processing, Signal Processing for Communications), Theory (Optimization, Random Processes, Statistics, Control Systems), and Computing (Graph Algorithms, Design and Analysis of Algorithms, Data Structures)

Teaching Experience

Teaching Assistant, Bilkent University Jan. 2020 – Jan. 2022
Tutored students in Introduction to Data Analysis, Programming in Python, and Electricity and Magnetism

Professional Activities

Reviewer, IEEE Journal of Selected Areas in Communications 2025
Conference Attendance, IEEE International Conference on Communications (ICC 2025) 2025
Professional Memberships: IEEE Student Member, IEEE Communications Society

Leadership & Activities

Volunteer, Orange County Alumni Association 2024 – Present
Mentor, Undergraduate Research Opportunities Program (UROP), UC Irvine 2024 – 2025
POWER Ambassador, UC Irvine 2024 – 2025
Mentor, Graduate International Connection, UC Irvine 2023 – 2024
Head of Sponsorship, Bilkent MUN Club 2021 – 2022
President, Bilkent Judo Club 2020 – 2021