Özlem Yıldız

Contact Information
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Summary
Ph.D. student in Electrical and Computer Engineering working at the intersection of machine learning, optimization, and wireless communications.

Professional Experience
5G Network simulation, mmWave Systems, Virtual Reality, Machine Learning, Beamforming, Analog/Hybrid Beam Alignment, Deep Neural Networks, Information Theory, Group Testing, 3GPP Specifications, Low Density Parity Check (LDPC) Coding, MATLAB 5G NR Toolbox, RayTracing Toolbox, Artifical Intelligence, Reinforcement Learning

- Virtual Reality over Wireless Channels (1 year – NYU Wireless)
- Frequency Dependent Beamforming (Internship – Samsung)
- Task Oriented Joint Source Channel Coding (1.5 years – NYU Wireless)
- Foundations of Deep Learning, Neural Cellular Automata (1.5 years—NYU Wireless)
- Intelligent Reflective Surfaces (Internship –Dell)
- Analog/Hybrid Beam Alignment (3 years—NYU Wireless)
- Adaptive Group Testing (1 year—NYU Wireless)
- Non-linear Waveform Spectral Performance (Internship—Interdigital)

Education

Ph.D. Candidate, Electrical and Computer Engineering, **GPA**: 3.923/4.0 2020 - present
NYU Tandon School of Engineering, New York, USA
Advisor: Prof. Elza Erkip
Courses: Heuristic Problem Solving, Image and Video Processing, Optimizational and Computational Linear Algebra, Foundations of Deep Learning, Digital Signal Processing Lab, Algorithmic Machine Learning and Data Science, Data Structures and Algorithms, Wireless Communications, Information Theory, Digital Signal Processing, Machine Learning, Deep Learning, Probability and Stochastic Processes

- School of Engineering Fellowship

B.Sc. Electrical and Electronics Engineering, **GPA**: 3.83/4.0 2015 - 2020
Bilkent University, Ankara, Turkey
Teaching: Algorithms and Programming 1, Microprocessors

- Fellowship student, the ranking: 215/2 million in university selection and placement exam
- **Study abroad**: University of Erlangen-Nuremberg, Erlangen, Germany between *March 2019 - August 2019* with Erasmus+ scholarship

Research Interests
Wireless Communications, Deep Learning, Virtual Reality, Machine Learning, Information Theory, Digital Signal Processing

Work Experiences

NYU Wireless, New York, USA 2020-Present Research Assistant

- Analog/Hybrid beam alignment by using group testing to detect multiple paths with Prof. Elza Erkip
- Joint source channel coding for task-based (semantic) communication with Prof. Elza Erkip and Prof. Yao Wang
- Investigation of virtual reality over wireless channels with Prof. Elza Erkip, Prof. Shivendra Panwar and Prof. Yao Wang

- The alignment of neural cellular automata with pathfinding problems using hand-coded networks and learned models with Prof. Julian Togelius and Prof. Chinmay Hegde

Samsung Research America, Dallas, USA 2023, Summer Internship
- 3D frequency dependent beamforming by using true time delay elements and phase shifters, supervised by Dr. Jianhua Mo and Dr. Ahmad AlAmmouri.
- Submitted a paper to IEEE ICC and applied for a patent.

Dell Technologies, New York, USA 2022, Summer Internship
- Secrecy capacity optimization of intelligent reflective surfaces-assisted mmWave indoor wireless communication, supervised by Dr. Tejinder Singh
- Optimization is based on projected gradient descent
- Ray-tracing simulation to model indoor wireless environment
- Published a paper in IEEE RWS and applied for a patent.

NYU Tandon School of Engineering, New York, USA 2021-Present, Course Assistant
- Introduction to Probability and Stochastic Processes (with Prof. Elza Erkip)
- Machine Learning (with Prof. Christopher Musco)

Interdigital, New York, USA 2021, Summer Internship
- Evaluation of non-linear waveform spectral performance for high frequencies and a waveform energy KPI, supervised by Dr. Ramon Khalona

P.I. Works, Ankara, Turkey 2019-2020, Part-time
- Network planning, management and optimization for the Turk Telekom network

Key Software, Ankara, Turkey 2018-2019, Part-time
- Real estate price prediction in R and Java

Polaran, Ankara, Turkey 2018, Summer Internship
- LDPC Coding according to the 3GPP specifications, supervised by Prof. Erdal Arikan

Roketsan, Ankara, Turkey 2018, Summer Internship
- RF circuits and pulse shaping filter design

Koc University Arcelik Research Center, Istanbul, Turkey 2017, Summer Internship
- Smart bottle design with both hardware and software components, supervised by Prof. Aykut Coskun

Technical skills MATLAB, Simulink, Python, Pytorch, Tensorflow, Scipy, Machine learning, C/C++, Linux, Java, SQL, Android

Publication

O. Yildiz, Ahmad AlAmmouri, Jianhua Mo, Younghan Nam, and Elza Erkip, "3D Beamforming Through Joint Phase-Time Arrays," submitted to IEEE ICC 2024

O. Yildiz, M. Alavirad, T. Singh, "Investigation and Optimization of Secrecy Capacity for Intelligent Reflective Surfaces-Assisted Secure mmWave Indoor Wireless Communication, " IEEE RWS 2023

S. Earle, **O. Yildiz**, J. Togelius, C. Hegde, "Pathfinding Neural Cellular Automata," , arXiv preprint arXiv:2301.06820

F. Wilhelmi, J. Hribar, S. F. Yilmaz, E. Ozfatura, K. Ozfatura, **O. Yildiz**, D. Gündüz, H. Chen, X. Ye, L. You, Y. Shao, P. Dini, B. Bellalta, "Federated Spatial Reuse Optimization in Next-Generation Decentralized IEEE 802.11 WLANs," ITU J-FET 2022

O. Yildiz, A. Khalili, and E. Erkip, "Hybrid Beam Alignment for Multi-path Channels: A Group Testing Viewpoint," IEEE Asilomar 2022

E. Erturk, **O. Yildiz**, S. Shahsavari and N. Akar, "Power Allocation and Temporal Fair User Group Scheduling for Downlink NOMA," Telecommun Syst 77, 753–766, 2021.

Selected Projects

- Investigation of Learned Image Compression for Feature Detection
  - Image and Video Processing class project using Ballé 2018 image compressor
- Eat, Move, Learn
  - Deep Learning class project using reinforcement learning for a multiplayer snake game (Kaggle competition: "Hungry Geese")
- AI for Atomic Force Microscope (AFM) Image Acquisition
  - Senior industrial design project to automate the AFM scanning system with machine learning, using gaussian process upper confidence bound and deep reinforcement learning algorithms

Personal Traits

Self-confident, highly motivated to explore, analytical thinker, determined, self-disciplined, good at planning and organization, punctual.