

# Furkan Bagci

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## Education

**University of Illinois Chicago, Chicago, IL, USA**  
Ph.D. Student, Electrical and Computer Engineering

*August 2025 – Present*

**Bilkent University, Ankara, Turkey**

*August 2022 – August 2025*

*M.Sc. in Electrical and Electronics Engineering*

Thesis Title: *On Over-The-Air Federated Learning Over Wireless Channels With Energy Harvesting and Heterogeneous Data Distribution* [Link]

**Bilkent University, Ankara, Turkey**

*September 2017 – June 2022*

*B.Sc. in Electrical and Electronics Engineering*

## Research Interests

Machine Learning for Wireless Communications, Interpretability, Federated Learning, Learning-Based MIMO Precoding, Error-Correcting Codes, Machine Learning, Wireless Communications

## Research Experience

**Graduate Researcher**  
*UIC*

*August 2025 – Present*

- Working under the supervision of [Prof. Natasha Devroye](#).
- Working on learning-based MIMO precoding design and interpretability.
- Working on transformer-based error-correcting code decoders.

**Graduate Researcher**

*August 2022 – August 2025*

*CTAR Lab, Bilkent University*

- Worked under the supervision of [Prof. Tolga Mete Duman](#).
- Developed diverse client scheduling strategies for over-the-air federated learning with energy-harvesting devices over wireless fading MACs, analyzing update estimation and user clustering.
- Proposed a personalized clustered federated learning framework enabling simultaneous multi-model over-the-air aggregation via a single parameter server with CSI-aware combining under blind transmitters.

## Relevant Courses

Bilkent University – *M.Sc.* Wireless Communications, Random Processes, Information Theory, Advanced Signal Processing, Detection and Estimation Theory

Bilkent University – *B.Sc.* Telecommunications I, Telecommunications II, Coding Theory, Digital Signal Processing, Neural Networks, Introduction to Machine Learning, Statistical Learning and Data Analytics

## Publications

**Cluster-Aware Scheduling and Model Personalization in Over-the-Air Federated Learning with Energy Constraints**

**F. Bagci**, B. Tegin, M. Kazemi, and T. M. Duman  
(under review, 2025)

**Update Estimation and Scheduling for Over-the-Air Federated Learning with Energy Harvesting Devices**

**F. Bagci**, B. Tegin, M. Kazemi, and T. M. Duman

2025 *IEEE International Conference on Communications Workshops (ICC Workshops)* [Link]

## Relative Localization for Swarm Aerial Vehicles

A. Aytekin, **F. Bağcı**, M. Bozdağ, N. Camuzcu, A. Duru, M. S. Elma, A. Maghsoudi, B. Barshan, S. Köse, and Ç. Akman

2022 30th Signal Processing and Communications Applications Conference (SIU) [\[Link\]](#)

## Experience

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### Teaching Assistant

August 2025 – Present

University of Illinois Chicago, Chicago, IL, USA

- Teaching Assistant for ECE 333 and ECE 225

### Teaching Assistant

August 2022 – August 2025

Bilkent University, Ankara, Turkey

- Coordinator Teaching Assistant for EEE 493/494 Industrial Design Project

### R&D Assistant Specialist

August 2022 – August 2025

Turk Telekom Inc., Ankara, Turkey

- Working on machine learning for next-generation wireless systems.

### Artificial Intelligence Intern

June 2021 – August 2021

Baykar Technology, Istanbul, Turkey

- Worked on monocular visual odometry for vehicles and UAVs. Implemented feature detection, feature description, and optical flow algorithms for motion estimation.

### Undergraduate Teaching Assistant

January 2021 – June 2021

Bilkent University, Ankara, Turkey

- Student Teaching Assistant for EEE212 Microprocessors

### Digital and Embedded Systems Intern

July 2020 – August 2020

ASELSAN, Ankara, Turkey

- Worked on test systems and embedded systems. Implemented serial communication channel between FPGA board and the computer using AXI4-Lite, UART, I2C and RS232-RS422.

### Digital Design Intern

June 2019 – July 2019

STM, Ankara, Turkey

- Worked on the improvement of some major UAVs. Implemented AXI4-Lite 3 Phase PWM Generator on Xilinx Zynq-7000 FPGA board

## Achievements & Scholarships

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### Achievements

- **Best Oral Presentation Award**, Bilkent University EEE Graduate Research Conference, 2025.
- Ranked in the top 0.4% among over 2 million students in the National University Entrance Exam, 2017.

### Scholarships

- 5G and Beyond Joint Graduate Support Programme Scholarship, Turk Telekom Inc., November 2022 – Present.

## Technical Skills

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Programming Languages	Python, MATLAB, Assembly, VHDL
Frameworks	PyTorch, Numpy, OpenCV

## Languages

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English	TOEFL: 106
Turkish	Native
German	Basic Proficiency

## Extra-curricular Activities

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### Swimmer

- Gained 40+ medals in national and regional tournaments as leading many teams as a captain and valuable team member.