

# BARIS ASKIN

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## EDUCATION

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**Carnegie Mellon University, Pittsburgh, USA**

*August 2022 - June 2027 (Anticipated)*

Ph.D. in Electrical and Computer Engineering

**GPA: 4.0/4.0**

*Advisors: [Dr. Gauri Joshi](#) & [Dr. Carlee Joe-Wong](#)*

**Bilkent University, Ankara, Turkey**

*September 2017 - June 2022*

B.Sc. in Electrical and Electronics Engineering

**CGPA: 3.99/4.0**

*Valedictorian*

Highest Ranked Graduate of 2022 in the Faculty of Engineering

## RESEARCH INTERESTS

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Federated Learning, Distributed Optimization, Machine Learning

## WORK & RESEARCH EXPERIENCE

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**Graduate Researcher**

*September 2022 – Present*

*Carnegie Mellon University, Pittsburgh, PA*

- Working on client scheduling for asynchronous federated learning (FL) with theoretical guarantees.
- Working on time- and resource-efficient algorithms for multi-model FL with convergence guarantees.
- Working on communication-efficient methods for federated multi-objective optimization.

**Undergraduate Researcher**

*September 2020 – July 2022*

*[Imaging and Computational Neuroscience Lab](#), Bilkent University, Ankara, Turkey*

- Worked on deep learning techniques for medical imaging under the supervision of [Dr. Tolga Cukur](#).
- Worked on super-resolution of Magnetic Particle Imaging (MPI) System Matrices with deep learning methods to accelerate the calibration process.
- Worked on learning-based image reconstruction techniques for MPI. Proposed the first deep plug-and-play priors-based method for MPI reconstruction.

**Summer Intern**

*June 2021 – July 2021*

*ASELSAN Research Center (Sensors and Imaging Technologies), Ankara, Turkey*

- Worked on novel deep learning models for the super-resolution of MPI system matrices under the supervision of [Dr. Alper Güngör](#).
- Proposed new deep learning-based methods to accelerate the calibration process.

**Summer Intern**

*June 2020 – July 2020*

*TÜBİTAK Advanced Technologies Research Institute, Ankara, Turkey*

- Worked on radar pulse detection and modulation classification project.
- Implemented a simulation using signal processing, image processing, and deep learning techniques.

## RELEVANT COURSES

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**CMU**

Advanced Introduction to Machine Learning, Convex Optimization, Intermediate Statistics, ABCDE of Statistical Methods in Machine Learning, Generative AI, Machine Learning with Large Datasets, Fundamentals of MDPs and Reinforcement Learning

**Bilkent University**

Linear Algebra, Statistical Learning and Data Analytics, Stochastic Models, Probability and Statistics, Signals and Systems, Computer Networks, Differential Equations, Digital Signal Processing, Telecommunications

## PUBLICATIONS

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1. **FedAST: Federated Asynchronous Simultaneous Training**  
**B. Askin**, P. Sharma, C. Joe-Wong, G. Joshi,  
*The Conference on Uncertainty in Artificial Intelligence (UAI), 2024* [[Link](#)][[Code](#)][[Poster](#)]
2. **Federated Communication-Efficient Multi-Objective Optimization**  
**B. Askin**, P. Sharma, G. Joshi, C. Joe-Wong  
*Preprint* [[Link](#)]  
*Studies on deep learning applications in medical imaging while I was at Bilkent:*
3. **DEQ-MPI: A Deep Equilibrium Reconstruction with Learned Consistency for MPI**  
A. Güngör, **B. Askin**, D. A. Soydan, C. B. Top, E. U. Saritas and T. Çukur  
*IEEE Transactions on Medical Imaging, Aug. 2023* [[Link](#)][[Code](#)]
4. **A Denoiser Scaling Technique for Plug-and-Play MPI Reconstruction**  
A. Güngör, **B. Askin**, D. A. Soydan, E. U. Saritas, C. B. Top and T. Çukur  
*International Journal on Magnetic Particle Imaging (IJMPI), Vol 9 No 1 Suppl 1, Mar. 2023* [[Link](#)]
5. **PP-MPI: A Deep Plug-and-Play Prior for Magnetic Particle Imaging Reconstruction**  
**B. Askin**, A. Güngör, D. A. Soydan, E. U. Saritas, C. B. Top and T. Çukur  
*International Workshop on Machine Learning for Medical Image Reconstruction (MLMIR), 2022* [[Link](#)]
6. **TranSMS: Transformers for Super-Resolution Calibration in Magnetic Particle Imaging**  
A. Güngör, **B. Askin**, D. A. Soydan, E. U. Saritas, C. B. Top and T. Çukur  
*IEEE Transactions on Medical Imaging, July 2022* [[Link](#)][[Code](#)]
7. **Deep Learned Super Resolution of System Matrices for Magnetic Particle Imaging**  
A. Güngör, **B. Askin**, D. A. Soydan, C. B. Top and T. Çukur  
*2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2021* [[Link](#)]

## SKILLS

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<b>Languages</b>	Python, MATLAB, Java, Assembly, VHDL
<b>Frameworks</b>	PyTorch, TensorFlow, OpenCV, Apache Spark

## PROFESSIONAL SERVICES

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- Reviewer for NeurIPS, ICLR, ICML, AISTATS, ISIT, AAAI, TMLR, and IEEE/ACM ToN
- Teaching Assistant for Introduction to Machine Learning for Engineers (18-661) in Spring 2024
- Teaching Assistant for Algorithms for Large-scale Distributed Machine Learning and Optimization (18-667) in Fall 2024

## SELECTED AWARDS AND ADDITIONAL INFORMATION

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- 2023-2024 Ben Cook Presidential Graduate Fellowship in Electrical & Computer Engineering at CMU
- Bilkent University Comprehensive Scholarship: Full tuition waiver & stipend during the B.Sc. Program.
- Scholarship of Turkish Ministry of Youth and Sports: Awarded stipend during the B.Sc. Program.
- Ranked 3rd in Academic Personnel and Postgraduate Education Entrance Exam (ALES) among 104 thousand applicants in Turkey.
- Ranked 252nd in Nationwide University Entrance Exam (LYS) among 2 million students in Turkey.
- Volunteer at Young Guru Academy (an international NGO based in Istanbul) from 2018 to 2020.
- Vice President at CMU Turkish Student Society since 2022.