Muhammad Usama Mirza

usama.mirza.819@gmail.com +92 310 9888841

Education

2021 – Present **M.Sc. Electrical and Electronics Engineering**, Bilkent University, Ankara
CGPA: *3.77 / 4.00*

2017 – 2021 **B.Sc. Electrical Engineering**, SEECS, NUST, Islamabad
CGPA: *3.77 / 4.00*

Research Publications

1. O. Dalmaz, U. Mirza, G. Elmas, *et al.*, "Pflsynth: Personalized federated learning of image synthesis in multi-contrast mri,"
2. O. Dalmaz, B. Saglam, G. Elmas, M. Mirza, and T. Çukur, "Denoising diffusion adversarial models for unconditional medical image generation," in *2023 31st Signal Processing and Communications Applications Conference (SIU)*, 2023, pp. 1–5. DOI: 10.1109/SIU59756.2023.10223912.
3. M. U. Mirza, O. Dalmaz, H. A. Bedel, *et al.*, *Learning fourier-constrained diffusion bridges for mri reconstruction*, 2023. arXiv: 2308.01096 [eess.IV].
4. M. U. Mirza and T. Çukur, "Super-resolution diffusion model for accelerated mri reconstruction," in *2023 31st Signal Processing and Communications Applications Conference (SIU)*, 2023, pp. 1–4. DOI: 10.1109/SIU59756.2023.10223786.
5. O. Dalmaz, U. Mirza, G. Elmas, M. Özbey, S. U. H. Dar, and T. Çukur, "A specificity-preserving generative model for federated mri translation," in *Distributed, Collaborative, and Federated Learning, and Affordable AI and Healthcare for Resource Diverse Global Health*, S. Albarqouni, S. Bakas, S. Bano, *et al.*, Eds., Cham: Springer Nature Switzerland, 2022, pp. 79–88, ISBN: 978-3-031-18523-6.
6. O. Dalmaz, U. Mirza, G. Elmas, *et al.*, *One model to unite them all: Personalized federated learning of multi-contrast mri synthesis*, 2022. arXiv: 2207.06509 [eess.IV].
7. M. U. Mirza, O. Dalmaz, and T. Çukur, "Skip connections for medical image synthesis with generative adversarial networks," in *2022 30th Signal Processing and Communications Applications Conference (SIU)*, 2022, pp. 1–4. DOI: 10.1109/SIU55565.2022.9864939.

Academic Experience

2021 – Present **Research Assistant**, National Magnetic Resonance Research Center
Worked on developing novel techniques for MRI Synthesis and Reconstruction as a member of Imaging and Computational Neuroscience (ICON) Lab.

2021 - Present **Teaching Assistant**, Bilkent University

- Math 241: Engineering Mathematics I
- Math 242: Engineering Mathematics II

2019 **Research Intern**, TUKL Research and Development Lab
Worked on the acceleration of Deep Neural Networks on FPGAs.

Academic Projects

2021 **Final Year Project: Crop Monitoring using Computer Vision and IoT**
Trained an object detection model to detect wheat heads using PyTorch

2017-2021 **Semester Projects**

- Generating Synthetic Data for Deep Learning
- Audio Classification using Machine Learning
- Maze Solving Robot
- Survival themed video game in C++

Academic Achievements

2016 **Outstanding Cambridge Learner Awards**, second highest mark in Islamabad for Best Across three Cambridge International AS Levels.

2015 **Outstanding Cambridge Learner Awards**, highest mark in the world in O-Level Mathematics.

2011, 2013 **Silver Medals**, in the International Kangaroo Mathematics Contest, Pakistan

Skills

Coding Python, C++, MATLAB

Frameworks PyTorch, TensorFlow, OpenCV