Muhammad Usama Mirza

Department of Electrical and Electronics Engineering
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Education

- **M.Sc. Electrical and Electronics Engineering**, Bilkent University, Ankara, Turkey 2021-Present
  CGPA: 3.77 / 4.00
  Courses:
  - Neural Networks
  - Machine Learning
  - Introduction to Computer Vision
  - Advanced Topics in Machine Learning and Signals and Systems

- **B.Sc. Electrical Engineering**, SEECS, NUST, Islamabad, Pakistan 2017-2021
  CGPA: 3.77 / 4.00
  Final Year Project: Crop Monitoring using Computer Vision and IoT
  Semester Projects:
  - Generating Synthetic Data for Deep Learning
  - Audio Classification using Machine Learning
  - Maze Solving Robot
  - Video Game using C++

Research Publications (Google Scholar)

- **Mirza, M. U.**, Dalmaz, O., Bedel, H. A., Elmas, G., Korkmaz, Y., Gungor, A., ... & Çukur, T. (2023). Learning Fourier-Constrained Diffusion Bridges for MRI Reconstruction. arXiv preprint arXiv:2308.01096.

- O. Dalmaz, B. Saglam, G. Elmas, **M. Mirza** and T. Çukur, "Denoising Diffusion Adversarial Models for Unconditional Medical Image Generation," 2023 31st Signal Processing and Communications Applications Conference (SIU), Istanbul, Turkiye, 2023, pp. 1-5, doi: 10.1109/SIU59756.2023.10223912.

- **M. U. Mirza** and T. Çukur, "Super-Resolution Diffusion Model for Accelerated MRI Reconstruction," 2023 31st Signal Processing and Communications Applications Conference (SIU), Istanbul, Turkiye, 2023, pp. 1-4, doi: 10.1109/SIU59756.2023.10223786.

- Dalmaz, O., **Mirza, U.**, Elmas, G., Özbey, M., Dar, S.U.H., Çukur, T. (2022). A Specificity-Preserving Generative Model for Federated MRI Translation. In: Albarqouni, S., et al. Distributed, Collaborative, and Federated Learning, and Affordable AI and Healthcare for Resource Diverse Global Health. DeCaF FAIR 2022 2022. Lecture Notes in Computer Science, vol 13573. Springer, Cham. https://doi.org/10.1007/978-3-031-18523-6_8

- Dalmaz, O., **Mirza, U.**, Elmas, G., Özbey, M., Dar, S. U., Ceyani, E., ... & Çukur, T. (2022). One model to unite them all: Personalized federated learning of multi-contrast MRI synthesis. arXiv preprint arXiv:2207.06509.

- **M. U. Mirza**, O. Dalmaz and T. Çukur, "Skip Connections for Medical Image Synthesis with Generative Adversarial Networks," 2022 30th Signal Processing and Communications Applications Conference (SIU), Safranbolu, Turkey, 2022, pp. 1-4, doi: 10.1109/SIU55565.2022.9864939.

- Dalmaz, O., **Mirza, U.**, Elmas, G., Özbey, M., Dar, S. U., Ceyani, E., ... & Çukur, T. pFLSynth: Personalized Federated Learning of Image Synthesis in Multi-Contrast MRI.

Academic Experience

- **Graduate Research Assistant**, National Magnetic Resonance Research Center, Ankara 2021-Present
  Worked on developing novel techniques for MRI Synthesis and Reconstruction as a member of Imaging and Computational Neuroscience (ICON) Lab.
- **Graduate Teaching Assistant**, Bilkent University, Ankara 2021-Present
  - Math 241: Engineering Mathematics I
  - Math 242: Engineering Mathematics II
- **Research Intern**, TUKL Research and Development Lab, Islamabad 2019
  Worked on the acceleration of Deep Neural Networks on FPGAs.

Academic Achievements

- **Outstanding Cambridge Learner Awards** 2016
  Second highest mark in Islamabad for Best Across three Cambridge International AS Levels.
- **Outstanding Cambridge Learner Awards** 2015
  Highest mark in the world in O-Level Mathematics.
- **Silver Medals**, in the International Kangaroo Mathematics Contest, Pakistan 2011, 2013

Skills

- Programming Languages: C++, Python, MATLAB
- AI: Generative Models, Object Detection, Image Classification
- Frameworks: PyTorch, TensorFlow, OpenCV
- Tools: LaTeX, Inkscape, HTML, CSS, FFmpeg