

# Muhammad Usama Mirza

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## 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

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- 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

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- 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

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- Coding      Python, C++, MATLAB
- Frameworks      PyTorch, TensorFlow, OpenCV

## References

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Dr. Tolga Çukur, Professor, National Magnetic Resonance Research Center (UMRAM), Department of Electrical and Electronics Engineering, Bilkent University, Ankara, Email: [cukur@ee.bilkent.edu.tr](mailto:cukur@ee.bilkent.edu.tr)

Dr. Sajjad Hussain, Assistant Professor, Department of Electrical Engineering, School of Electrical Engineering and Computer Science, NUST, Islamabad, Email: [sajjad.hussain2@seecs.edu.pk](mailto:sajjad.hussain2@seecs.edu.pk)