Mahmut Yurt

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Research Interests

- Machine Learning
- Deep Generative Models
- Medical Imaging
- Computer Vision
- Unsupervised Learning
- Large Language Models

Education

Sep 2021 – Jun 2025 **Stanford University**, *Stanford, CA, United States*
Ph.D., Department of Electrical Engineering
Advisor: Prof. John Pauly
Thesis: Robust, Data-Efficient Deep Learning for Accelerated MRI Recovery.

Jul 2019 – Jul 2021 **Bilkent University**, *Ankara, Turkey*
M.Sc., Department of Electrical and Electronics Engineering
Advisor: Prof. Tolga Cukur
Thesis: Deep Learning for Multi-Contrast MRI Synthesis.

Sep 2014 – Jun 2019 **Bilkent University**, *Ankara, Turkey*
B.Sc., Department of Electrical and Electronics Engineering
Advisor: Prof. Cem Tekin
Thesis: Autonomous Vehicle Applications.

Professional Experience

Jul 2020 – Sep 2021 **Moonsoft Software Company**, *Ankara, Turkey*
Co-founder and Chief Technology Officer,
- received a merit-based **grant of $30K from Turkish government**
- managed and supervised a team of 10 members
- developed an end product to reconstruct 3D AutoCAD designs from 2D architectural drawings.

Jul 2018 – Aug 2018 **Pixel Imaging Company**, *Ankara, Turkey*
Software internship,
- software development using hardware description language for a camera chip.

Jul 2017 – Aug 2017 **National Magnetic Resonance Research Center**, *Ankara, Turkey*
Research internship,
- development of deep generative models for medical imaging.

Honors and Awards

2023 **ISMRM 2023 Summa Cum Laude**: awarded to top 3% papers among 10k submissions

2023 **Workshop on Data Sampling & Image Reconstruction**: best poster award among 50 candidates

2021-2022 **Stanford University, Lewis M. and Barbara C. Terman Graduate Fellowship**: full tuition waiver and stipend during the first year of Ph.D.

2021 **University of California, Berkeley, Fellowship for Graduate Study:** recipient of multi-year fellowship awarded to exceptional Ph.D. applicants

2021 **Bilkent University, Graduate Research Conference**: best paper award in deep learning

2019–2021 **Scientific and Technological Research Council of Turkey**: monthly stipend and accommodation support during M.Sc. (project no: 118E256)

2020 **1512 BIGG Grant Start-Up Program**: merit-based governmental grant of $30K, awarded to 144 start-up companies among 4000 competitors (project no: 2200008)

2019 **Turkish Postgraduate Education Exam**: ranked 22nd among 300,000 candidates

2014–2019 **Bilkent University, Scholarship**: full tuition waiver and stipend during B.Sc.

2014–2019 **Turkish Prime Ministry Fellowship**: merit-based national fellowship of monthly stipend during B.Sc., granted to only 100 students among 2.2 million candidates in Turkey

2018 **Bilkent University Graduate Research Conference**: best paper award in deep learning

2014 **Turkish National University Entrance exam**: ranked 27th among 2.2 million candidates

Publications (Google Scholar link, 1100+ citations)

Papers

[9] **M. Yurt**, B. Ozturkler, K. Setsompop, S. Vasanawala, J. Pauly, and A. Chaudhari, "Conditional denoising diffusion probabilistic models for universal MR image recovery," *to be submitted to IEEE Transactions on Medical Imaging*, 2023.

[8] X. Cao, C. Liao, Z. Zhou, Z. Zhong, Z. Li, E. Dai, S. S. Iyer, A. J. Hannum, **M. Yurt**, S. Schauman, Q. Chen, N. Wang, J. Wei, Y. Yan, H. He, S. Skare, J. Zhong, A. Kerr, and K. Setsompop, "DTI-MR fingerprinting for rapid high-resolution whole-brain T1, T2, proton density, ADC, and fractional anisotropy mapping," *Magnetic Resonance in Medicine*, [Online]. Available: `https://doi.org/10.1002/mrm.29916`.

[7] **M. Yurt**, O. Dalmaz, S. Dar, M. Ozbey, B. Tınaz, K. Oguz, and T. Çukur, "Semi-supervised learning of MRI synthesis without fully-sampled ground truths," *IEEE Transactions on Medical Imaging*, vol. 41, no. 12, pp. 3895–3906, 2022. DOI: `10.1109/TMI.2022.3199155`.

[6] **M. Yurt**, M. Ozbey, S. Dar, B. Tinaz, and T. Cukur, "Progressively volumetrized deep generative models for data-efficient contextual learning of MR image recovery," *Medical Image Analysis*, vol. 78, p. 102 429, 2022, ISSN: 1361-8415. [Online]. Available: `https://www.sciencedirect.com/science/article/pii/S1361841522000809`.

[5] Y. Korkmaz, S. Dar, **M. Yurt**, M. Ozbey, and T. Cukur, "Unsupervised MRI reconstruction via zero-shot learned adversarial transformers," *IEEE Transactions on Medical Imaging*, vol. 41, no. 7, pp. 1747–1763, 2022. [Online]. Available: `https://ieeexplore.ieee.org/document/9695412`.

[4] O. Dalmaz, **M. Yurt**, and T. Cukur, "ResViT: Residual vision transformers for multi-modal medical image synthesis," *IEEE Transactions on Medical Imaging*, vol. 41, no. 10, pp. 2598–2614, 2022. [Online]. Available: `https://ieeexplore.ieee.org/document/9758823`.

[3] **M. Yurt**, S. Dar, A. Erdem, E. Erdem, K. Oguz, and T. Cukur, "mustGAN: multi-stream generative adversarial networks for MR image synthesis," *Medical Image Analysis*, vol. 70, p. 101 944, 2021. [Online]. Available: `https://www.sciencedirect.com/science/article/abs/pii/S136184152030308X`.

[2] S. Dar, **M. Yurt**, M. Shahdloo, M. Ildiz, B. Tinaz, and T. Cukur, "Prior-guided image reconstruction for accelerated multi-contrast MRI via generative adversarial networks," *IEEE Journal of Selected Topics in Signal Processing*, vol. 14, no. 6, pp. 1072–1087, 2020. [Online]. Available: `https://ieeexplore.ieee.org/document/9115255`.

[1] S. Dar, **M. Yurt**, L. Karacan, A. Erdem, E. Erdem, and T. Cukur, "Image synthesis in multi-contrast MRI with conditional generative adversarial networks," *IEEE Transactions on Medical Imaging*, vol. 38, no. 10, pp. 2375–2388, 2019. [Online]. Available: `https://ieeexplore.ieee.org/document/8653423`.

Book Chapters

[1] T. Çukur, **M. Yurt**, S. U. H. Dar, H. Chung, and J. C. Ye, "Chapter 12: Image synthesis in multi-contrast mri with generative adversarial networks," in *Deep Learning for Biomedical Image Reconstruction*, Cambridge: Cambridge University Press, 2023.

Peer-Reviewed Conference Proceedings

[24] **M. Yurt**, K. Ryu, Z. Li, X. Zhu, X. Mao, M. Janich, J. Pauly, A. Syed, and S. Vasanawala, "Deep learning reconstruction for free-breathing radial cine imaging," in *Society for Cardiovascular Magnetic Resonance (SCMR)*, London, 2024.

[23] T. Xiang, **M. Yurt**, A. B. Syed, K. Setsompop, and A. Chaudhari, "DDM2: Self-Supervised Diffusion MRI Denoising with Generative Diffusion Models," in *International Conference on Learning Representations (ICLR)*, 2023.

[22] **M. Yurt**, B. Ozturkler, K. Setsompop, S. Vasanawala, J. Pauly, and A. Chaudhari, "Conditional denoising diffusion probabilistic models for inverse mr image recovery," in *31th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Toronto, Jun. 2023 (summa cum laude top 3% papers).

[21] **M. Yurt**, C. Alkan, S. Schauman, X. Cao, C. Liao, S. Iyer, T. Cukur, S. Vasanawala, J. Pauly, and K. Setsompop, "Semi-supervision for clinical contrast synthesis from magnetic resonance fingerprinting," in *31th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Toronto, Jun. 2023 (magna cum laude top 10% papers).

[20] **M. Yurt**, C. Alkan, S. Schauman, X. Cao, S. Iyer, C. Liao, T. Cukur, S. Vasanawala, J. Pauly, and K. Setsompop, "Semi-supervision for clinical contrast synthesis from magnetic resonance fingerprinting," in *Medical Imaging Meets NeurIPS*, New Orleans, Dec. 2022.

[19] **M. Yurt**, B. Ozturkler, R. Yesiloglu, J. Pauly, K. Setsompop, and A. Chaudhari, "Conditional diffusion models for inverse MR image recovery," in *IEEE 19th International Symposium on Biomedical Imaging (ISBI)*, Kolkata, India, Apr. 2022.

[18] S. Iyer, C. Sandino, **M. Yurt**, X. Cao, S. Schauman, and K. Setsompop, "SMILR - subspace machine learning reconstruction," in *30th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, London, May 2022.

[17] S. Schauman, S. Iyer, **M. Yurt**, X. Cao, C. Liao, G. Wang, G. Zaharchuk, S. Vasanawala, and K. Setsompop, "Toward a 1-minute high-resolution brain exam - MR fingerprinting with ML-synthesized contrasts and fast reconstruction," in *30th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, London, May 2022.

[16] X. Cao, C. Liao, Z. Zhong, E. Dai, S. Iyer, A. Hannum, **M. Yurt**, S. Skare, and K. Setsompop, "3D diffusion-prepared MRF (3DM) with cardiac gating for rapid high resolution whole-brain T1, T2, proton density and diffusivity mapping," in *30th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, London, May 2022.

[15] C. Liao, X. Cao, S. Iyer, Z. Zhou, Y. Liu, J. Haldar, **M. Yurt**, T. Gong, Z. Wu, H. He, J. Zhong, A. Kerr, and K. Setsompop, "Mesoscale myelin-water fraction and T1/T2/PD mapping through optimized 3D ViSTa-MRF and stochastic reconstruction with preconditioning," in *30th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, London, May 2022.

[14] O. Dalmaz, **M. Yurt**, and T. Cukur, "Medical image synthesis with residual vision transformers," in *Medical Imaging Meets NeurIPS*, Virtual Conference, Dec. 2021.

[13] Y. Korkmaz, **M. Yurt**, S. Dar, M. Ozbey, and T. Cukur, "Deep MRI reconstruction with generative vision transformers," in *International Workshop on Machine Learning for Medical Image Reconstruction (MICCAI-MLMIR)*, Springer, 2021, pp. 54–64.

[12] **M. Yurt**, S. Dar, B. Tinaz, M. Ozbey, Y. Korkmaz, and T. Cukur, "A semi-supervised learning framework for jointly accelerated multi-contrast mri synthesis without fully-sampled ground-truths," in *29th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Virtual Conference, May 2021.

[11] **M. Yurt**, M. Ozbey, S. Dar, B. Tinaz, K. Oguz, and T. Cukur, "Progressive volumetrization for data-efficient image recovery in accelerated multi-contrast MRI," in *29th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Virtual Conference, May 2021.

[10] Y. Korkmaz, S. Dar, **M. Yurt**, M. Ozbey, and T. Cukur, "A zero-shot learning approach for accelerated MRI reconstruction," in *29th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Virtual Conference, May 2021.

[9] **M. Yurt**, B. Tınaz, M. Ozbey, S. Dar, and T. Cukur, "Semi-supervised learning of multi-contrast MR image synthesis without fully-sampled ground-truth acquisitions," in *Medical Imaging Meets NeurIPS*, Virtual Conference, Dec. 2020.

[8] **M. Yurt**, S. Dar, A. Erdem, E. Erkut, and T. Cukur, "A multi-stream GAN approach for multi-contrast MRI synthesis," in *28th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Virtual Conference, Aug. 2020.

[7] S. Dar, **M. Yurt**, M. Ozbey, and T. Cukur, "Hybrid deep neural network architectures for multi-coil MR image reconstruction," in *28th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Virtual Conference, Aug. 2020.

[6] **M. Yurt**, S. Dar, A. Erdem, E. Erdem, and T. Cukur, "Adaptive fusion via dual-branch GAN for multi-contrast MRI synthesis," in *IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, Virtual Conference, Apr. 2020.

[5] M. Ozbey, **M. Yurt**, S. Dar, and T. Cukur, "Three-dimensional MR image synthesis with progressive generative adversarial networks," in *IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, Virtual Conference, Apr. 2020.

[4] S. Dar, **M. Yurt**, M. Ozbey, and T. Cukur, "Hybrid deep neural networks for parallel MR image reconstruction," in *IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, Virtual Conference, Apr. 2020.

[3] S. Dar, **M. Yurt**, L. Karacan, A. Erdem, E. Erdem, and T. Cukur, "Journal paper: Image synthesis in multi-contrast MRI with conditional generative adversarial networks," in *IEEE 17th International Symposium on Biomedical Imaging (ISBI)*, Virtual Conference, Apr. 2020.

[2] **M. Yurt** and T. Çukur, "Multi-image super resolution in multi-contrast MRI," in *IEEE 28th Signal Processing and Applications (SIU)*, Virtual Conference, Oct. 2020.

[1] S. Dar, **M. Yurt**, M. Shahdloo, M. E. Ildız, and T. Cukur, "Joint recovery of variably accelerated multi-contrast MRI acquisitions via generative adversarial networks," in *27th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Montreal, May 2019.

Invited Talks

2022 **University of California, Berkeley, Liu Lab**,
Data-Efficient Deep Learning Techniques for Medical Image Recovery.

2021 **Workshop on MRI Acquisition and Reconstruction**,
Progressively Volumetrized Deep Generative Models for Inverse MR Image Recovery.

Academic Duties

Program Committee

2021 **ICCV – International Conference on Computer Vision**,
• *Computer Vision for Automated Medical Diagnosis.*

2021 **NeurIPS – Conference on Neural Information Processing Systems**,
• *Medical Imaging Meets*
• *ML4H: Machine Learning for Health.*

Reviewer

2023 **Magnetic Resonance in Medicine**,
• *Journal paper.*

2023 **IEEE Transactions on Image Processing**,
• *Journal paper.*

2022–2024 **CVPR – Computer Vision and Pattern Recognition**,
• *Main Conference.*

2022 **ECCV – European Conference on Computer Vision**,
• *Main Conference.*

2023 **ICCV – International Conference on Computer Vision**,
• *Main Conference.*

2021 **Signal Image and Video Processing**,
• *Journal paper.*

2021 **Medical Physics**,
• *Journal paper.*

Teaching Assistance

2019–2021 **Electrical and Electronics Engineering at Bilkent University**.

- EEE 443/543: Neural Networks
- EEE 493: Industrial Design Project I
- EEE 212: Microprocessors
- EEE 321: Signals and Systems
- EEE 494: Industrial Design Project II

Programming Skills

Programming	Python, Matlab, Java, VHDL, C++, Android
Frameworks	PyTorch, TensorFlow, NumPy, Matplotlib, OpenCV, Git
Tools	LaTeX, Jupyter, Inkscape, Illustrator, Photoshop, AWR, DICOM, FSL, Imagine

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