TOYGAN KILIC

 Minnesota, USA | ✉ toygank@gmail.com | ▪ +1 (612) 405-7898 | in toygan-kilic | ⌗ Toygan | Green Card Holder

SKILLS

Programming	Python, MATLAB, C++, VHDL
ML Related	PyTorch, OpenCV, MLflow, Pandas
Research Interests	Machine/Deep learning, MRI reconstruction, Radar Systems, HDR/camera imaging
Systems	Linux/Unix, Git/GitHub, VS Code
Tools	MRI sequence programming (Siemens IDEA)

EDUCATION

2021 – 2026   **Ph.D.** in Electrical & Computer Engineering   **University of Minnesota**   (GPA: 4.00/4.00)
Thesis: *Deep Learning Methods for Ultra High Field MRI*
Advisor: Prof. Mehmet Akçakaya

2016 – 2019   **M.S.** in Electrical & Electronics Engineering   **Bilkent University**   (GPA: 3.45/4.00)
Thesis: *Rapid Multi-Contrast MRI and Time-of-Flight Angiography*
Primary Advisor: Assoc. Prof. Emine Ülkü Sarıtaş
Secondary Advisor: Prof. Tolga Çukur

2011 – 2016   **B.S.** in Electrical & Electronics Engineering   **Bilkent University**   (GPA: 3.41/4.00)

WORK EXPERIENCE

Research Assistant, UMN (Minnesota, USA)   Aug 2021 – January 2026
– Developed deep learning methods for B_1^+ inhomogeneity correction at 7T in pTx, in collaboration with Siemens.
– Advanced diffusion-weighted MRI reconstruction using deep learning with physics-driven priors and score-based denoising.
– Implemented optimization algorithms for parallel transmit (pTx) pulse design and reconstruction methods.
– Published 1 journal article and 9 conference papers on MRI reconstruction and pTx methods.

Digital Design Engineer, ASELSAN (Ankara, Turkey)   Nov 2020 – Jul 2021
– Implemented and optimized radar algorithms on FPGA to enhance system performance.
– Integrated external components; implemented UART and I^{2}C interfaces for FPGA systems.

Radar System Design Engineer, ASELSAN (Ankara, Turkey)   May 2019 – Nov 2020
– Developed 3D radar imaging algorithms for high-resolution spatial mapping.
– Designed target detection and classification algorithms
– Performed link-budget and system performance analyses
– Defined system requirements and specifications for radar platforms.

R&D Engineer, ORTANA (Ankara, Turkey)   Aug 2018 – May 2019
– Implemented HDR imaging algorithms and end-to-end camera processing pipelines in C++/MATLAB.
– Built a camera image quality test lab and evaluated performance with Imatest
– Built a camera test laboratory

Research Assistant, Bilkent University (Ankara, Turkey)   Jan 2016 – Feb 2019
– Designed multi-contrast MRI reconstruction methods for parallel imaging
– Programmed pulse sequences on Siemens IDEA for compressed sensing
– Collaborated with radiologists on TOF angiography, improving vessel visualization
– Conducted extensive *in vivo* experiments.

Undergraduate Research Assistant, Bilkent University (Ankara, Turkey)   Jan. 2013 – Jan. 2015
– Examined EEG data with Fieldtrip Toolbox (Supervisor: Asst. Prof. Hulusi Kafalıgönül).
– Simulated E-Class Power Amplifier (Supervisor: Prof. Ergin Atalar).

INTERNSHIPS

Embedded Software Engineer (Intern), Greinon Engineering AB (Lund, Sweden)   Jan 2015 – Feb 2015
– Implemented communication between IoT devices using the CC3200 LaunchPad.

Digital Design Engineer (Intern), ASELSAN (Ankara, Turkey)   Jun 2013 – Sep 2013
– Implemented the Hadamard Transform using DSP Builder (Simulink) for VHDL generation.

Summer Intern, National Magnetic Resonance Research Center (Ankara, Turkey)   Jun 2013 – Sep 2013
– Analyzed LFP brain signals using Hilbert and Wavelet transform techniques.

ACADEMIC HONORS AND AWARDS

- ECE Department Fellowship, **University of Minnesota**   2021–2022
- Best Student Paper Award, IEEE EMBS Turkey, 29th *IEEE SIU*   May 2018
- Dean's Honor List (7 semesters)   2011–2015
- Tuition Waiver   2013–2015

TEACHING EXPERIENCES

Graduate Teaching Assistant, Bilkent University (Ankara, Turkey)
– EEE 574 - Foundations of Magnetic Resonance Imaging: Grader   Jan. 2018 – Jun. 2018

– GE 402 - Innovative Design and Entrepreneurship II: Grader and Lab Assistant   Jan. 2018 – Jun. 2018

– EEE 530 - Digital Communications Theory: Grader   Oct. 2017 – Jan. 2018

– EEE 212 - Microprocessors: Lab Assistant   Jan. 2016 – Jun. 2017

– EEE 211 - Analog Electronics: Lab Assistant   Oct. 2016 – Jan. 2017

Undergraduate Teaching Assistant, Bilkent University (Ankara, Turkey)
– CS 113 - Introduction to Computing (MATLAB): Lab Assistant   Jun. 2015 – Aug. 2015, Oct. 2015 – Jan. 2016

– PHYS 102 - General Physics II: Grader   Jun. 2014 – Sept. 2014

RELEVANT COURSEWORK

- EE 5561 – Image Processing and Applications: From Linear Filters to Artificial Intelligence
- CSCI 5521 – Machine Learning Fundamentals
- EE 5239 – Introduction to Nonlinear Optimization

PUBLICATIONS

Journal Articles

[1] **Kilic, T**, P Liebig, OB Demirel, J Herrler, A Nagel, K Ugurbil, and M Akcakaya. "Unsupervised Deep Learning with Convolutional Neural Networks for Static Parallel Transmit Design: A Retrospective Study". In: *Magn. Reson. Med.* (2024). Online ahead of print. DOI: `10.1002/mrm.30014`.

[2] E Kopanoglu, A Gungor, **Kilic, T**, EU Saritas, KK Oguz, T Cukur, and HE Guven. "Simultaneous use of Individual and Joint Regularization Terms in Compressive Sensing: Joint Reconstruction of Multi-Channel Multi-Contrast MRI Acquisitions". In: *NMR Biomed.* (2021). DOI: `10.1002/nbm.4247`.

[3] OB Demirel, **Kilic, T**, T Cukur, and EU Saritas. "Anatomical Measurements Correlate with Individual Magnetostimulation Thresholds for kHz-range Homogeneous Magnetic Fields". In: *Med. Phys.* 47 (2020), pp. 1836–1844. DOI: `10.1002/mp.14032`.

[4] LK Senel, **Kilic, T**, A Gungor, E Kopanoglu, HE Guven, EU Saritas, A Koc, and T Cukur. "Statistically Segregated k-Space Sampling for Accelerating Multiple-Acquisition MRI". In: *IEEE Trans. Med. Imag.* 38.7 (2019), pp. 1701–1714. DOI: 10.1109/TMI.2019.2892378.

Conference Proceedings

[1] M. Saberi, **Kilic, T**, and M. Akcakaya. "Decoupled Magnitude–Phase Regularization for Physics-Driven Unrolled Networks". In: *Sedona Workshop on Image Reconstruction.* Submitted. Sedona, AZ, USA, 2026.

[2] M. Saberi, **Kilic, T**, and M. Akcakaya. "UMPIRE-Net: Unrolled Magnitude-Phase Regularization Network for MRI Reconstruction". In: *Proceedings of the 34th Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM).* Submitted. Cape Town, South Africa, May 2026.

[3] J. Yun, **Kilic, T**, J. Herrler, P. Liebig, K. Ugurbil, and M. Akcakaya. "Hard-Constrained Parallel Transmit Design with Unrolled Homeomorphic Projection". In: *Proceedings of the 34th Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM).* Submitted. Cape Town, South Africa, May 2026.

[4] J. Yun, **Kilic, T**, J. Herrler, P. Liebig, K. Ugurbil, and M. Akcakaya. "Strict Quadratically-Constrained Parallel Transmit Design with Unrolled Homeomorphic Projection". In: *Proceedings of the IEEE International Symposium on Biomedical Imaging (ISBI).* Submitted. London, UK, Apr. 2026.

[5] **Kilic, T**, YU Alcalar, S Moeller, and M Akcakaya. "Phase-Adaptive Averaging and Score-Based Denoising for Inverse Problems in Diffusion Imaging". In: *Proc. Asilomar Conf. Signals, Systems, and Computers.* Pacific Grove, CA, 2025.

[6] **Kilic, T**, J Herrler, P Liebig, OB Demirel, A Nagel, K Ugurbil, and M Akcakaya. "Towards Fast Hard-Constrained Parallel Transmit Design in Ultrahigh Field MRI With Physics-Driven Neural Networks". In: *Proc. IEEE Int. Symp. Biomed. Imaging (ISBI).* 2024.

[7] **Kilic, T**, J Herrler, P Liebig, OB Demirel, A Nagel, K Ugurbil, and M Akcakaya. "Towards Physics-Driven Neural-Network pTx Design with Hard Constraints". In: *Proc. 32nd Annual Meeting ISMRM.* Singapore, 2024.

[8] OB Demirel, C Zhang, B Yaman, **Kilic, T**, S Moeller, C Shenoy, S Weingärtner, T Leiner, and M Akçakaya. "Database-Free ZS-Deep Learning Reconstruction for Highly-Accelerated Free-Breathing Perfusion CMR". In: *Proc. 31st Annual Meeting ISMRM.* Toronto, Canada, 2023, p. 0388.

[9] **Kilic, T**, P Liebig, OB Demirel, J Herrler, A Nagel, K Ugurbil, and M Akçakaya. "Unsupervised Deep Learning for Fast Parallel Transmit Design". In: *ISMRM Workshop on Ultra-High Field MR.* 2022.

[10] OB Demirel, **Kilic, T**, T Cukur, and EU Saritas. "Simple Anatomical Measures Correlate with Individual PNS Thresholds for kHz-range Homogeneous Magnetic Fields". In: *Proc. 28th Annual Meeting ISMRM.* Virtual, 2020, p. 1127.

[11] E Kopanoglu, A Gungor, **Kilic, T**, EU Saritas, K Oguz, T Cukur, and HE Guven. "Multi-Channel Multi-Contrast Reconstructions via Simultaneous Use of Individual and Joint Regularization Terms". In: *Proc. 27th Annual Meeting ISMRM.* Montreal, Canada, 2019, p. 4748.

[12] **Kilic, T**, O Algin, T Cukur, and EU Saritas. "Joint Partial Fourier and Compressed Sensing Reconstruction for Accelerated Time-of-Flight MR Angiography". In: *Proc. 26th IEEE SIU.* Izmir, Turkey, 2018.

[13] E Kopanoglu, A Gungor, **Kilic, T**, EU Saritas, T Cukur, and HE Guven. "Compressive Sensing Reconstruction for Multi-Contrast Data with Unequal Acceleration Rates". In: *Proc. 26th Annual Meeting ISMRM.* Paris, France, 2018, p. 3534.

[14] **Kilic, T**, E Ilicak, T Cukur, and EU Saritas. "Improved SPIRiT Operator for Joint Reconstruction of Multiple T2-Weighted Images". In: *Proc. 25th Annual Meeting ISMRM.* Hawaii, USA, 2017, p. 5165.

[15] E Kopanoglu, A Gungor, **Kilic, T**, EU Saritas, T Cukur, and HE Guven. "Joint Reconstruction of Multi-Contrast Images Using Joint and Individual Regularization". In: *Proc. 25th Annual Meeting ISMRM.* Hawaii, USA, 2017, p. 3875.