Bilal Tasdelen — Curriculum Vitae

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in Bilal Tasdelen

Education

University of Southern California, USC — **Los Angeles**
Ph.D. Student, Department of Electrical and Computer Engineering — *2021–Expected 2026*

Advisor: Dr. Krishna S. Nayak

Bilkent University — **Ankara**
MS. Department of Electrical and Electronics Engineering, CGPA: 3.67/4.00 — *2017–2020*

Thesis: Dynamic Decoupling and Noise Analysis for Simultaneous Transmission and Reception Imaging, *Advisor:* Dr. Ergin Atalar

Bilkent University — **Ankara**
B.Sc. Department of Electrical and Electronics Engineering, CGPA: 3.53/4.00 — *2013–2017*

AGH University of Science and Technology — **Krakow**
Faculty of Computer Science, Electronics and Telecommunications, ERASMUS — *2015–2016*

Skills

- **Computer Skills:** Proficient in: C, C++, Python, Matlab, OpenGL, Arduino, LATEX, VHDL
  Can create GUIs in Qt Library. Proficient in Linux enough to give tutorials in a student branch.
- **Industry Software Skills:** AWR Microwave Office, LTspice, KiCAD, Eagle, Autodesk Fusion360, Inkscape
- **Languages:** Turkish **(Native)**, English **(Advanced)**

Experience

Research Experience

DISC (Dynamic Imaging Science Center) — **Los Angeles**
Research Assistant — *August 2022–ongoing*

'Electromagnetic Interference (EMI) Mitigation in MRI'

Leading a project that enables the use of many devices inside the MRI scanner room, without considering their EMI compliance. Eventually, cage-free MRI will be possible which will drive the cost of the scanner siting, making the technology more available to underserved populations. Preliminary results were presented in ISMRM2023 as a digital poster.

'High-amplitude Pilot Tone'

Proposed a project that makes it possible to use high-amplitude pilot tone, which is a bleeding-edge technology that is used to sense the motion (e.g. respiratory, cardiac) of the patient without placing any sensors on the body. Current techniques use low-power signal, which suffers from low SNR and does not work well on mid and low-field systems. This work enables pilot tone for mid and low-field strengths, and potentially improves the quality for conventional systems. Preliminary results were presented in ISMRM2023 as a digital poster.

'Ultra-fast fat-water separated imaging at 0.55T'

- Acquired fat-water separated abdomen imaging in a faster and efficient manner by exploiting the inherent characteristics of the mid-field MRI.
- Designed and performed more than 20 healthy and fatty liver patient human experiments.
- Implemented 3D multi-echo reconstruction, fat and water estimation pipelines in Matlab. Results presented as a 1 conference abstract.

UMRAM (National Magnetic Resonance Research Center) — **Ankara**
Researcher — *June 2017–2021*

'Simultaneous Transmission and Reception in MRI' (Master's thesis)

- Designed a system consisting of hardware and software that is able to actively isolate coupled transmit and receive coils for simultaneous transmission and reception.
- Designed and tested many RF devices including: vector modulator, low noise pre-amplifier, high gain MMIC amplifier, near field RF antennas.
- Developed a look-up-table based control algorithm for controlling the devices dynamically.
- Implemented SWIFT, cSWIFT and UTE pulse sequences in Siemens IDEA platform (C++).
- Performed noise and distortion analysis for the implemented system and simultaneous transmission and reception for MRI.
- Learned to use several measurement and testing devices such as MRI scanner, network analyzer, spectrum analyzer, signal generator, digital-to-analog converters etc. Results are published in Magnetic Resonance in Medicine as a journal paper.

'Vector Modulator Based Active Compensation of Direct Feedthrough in MPI'

- Collaborated with another research group on a novel imaging modality, Magnetic Particle Imaging (MPI).
- Designed and implemented a vector modulator for Magnetic Particle Imaging to eliminate direct feedthrough and shown its application. Results were presented as two conference abstracts.

'Spatiotemporal magnetic field monitoring with hall effect sensors during the MRI'

Worked in the development of a magnetic field monitoring system based on hall effect sensors for MRI. There is a patent of this project.

Teaching Experience

Bilkent University **Ankara**
Teaching Assistant *2017–2021*

○ Industrial Design Projects course. Logistically and technically supported three projects and maintained communication between the groups and the companies. • Web Page (In Turkish) • Course Video
○ Digital Electronics and Computational Neuroscience classes, one semester each. Held regular lab sessions, graded projects and homeworks, held review sessions and office hours.

Work Experience

UMRAM (National Magnetic Resonance Research Center) **Ankara**
Internship *June-August 2016*

○ Implemented MDEV and k-MDEV algorithms in MATLAB.
○ Designed an automated experiment setup which communicates with scanner and signal generator that significantly accelerates MRE experiments, using an Arduino.
○ Co-authored 3 abstracts and 1 journal paper related to this project.

NanoMagnetics Instruments **Ankara**
Internship *June-August 2015*

○ Implemented an FPGA (VHDL, Vivado) based Spectrum Analyzer that displays frequency spectrum of the digitized signal on a PC in real-time.
○ Implemented a user interface and post-processing algorithms in C and OpenGL.
○ Familiarized with working principles of AFM and STM devices. • Company Website

Other Projects and Contributions

Project Contributor: *PyPulseq*
○ Active contributor and maintainer in this open-source MRI pulse sequence programming framework written in Python.

Senior Project: *'Target and Self Localization via UAV Camera'*
○ This is a one-year-long project with a group of 5 in collaboration with ASELSAN. Developed a self and target localization system by utilizing only a mono camera and IMU.
○ Implemented data acquisition from UAV sensors and camera using Java (Android), and integration of these sensors into ORB-SLAM 2 algorithms using C++.
   Project Video (English Subtitles) • Supplementary Video 1 • Supplementary Video 2
○ Learned camera geometry, computer vision algorithms such as MonoSLAM, Kalman Filtering, RANSAC, with an emphasis on real-time requirement.
○ **Awarded 1st Place Prize, IEEE Turkey Senior Projects Competition, 2017.**

Awards and Honors

○ Best Poster Award, Graduate Research Conference, 2018, Ankara, Turkey
○ 1st Place Prize, IEEE Turkey Senior Projects Competition, 2017, Cyprus
○ Magna Cum Laude, Bilkent University, Ankara, Turkey
○ Comprehensive Scholarship, Bilkent University, 2013-2017
○ Ranked 124th among 1.2 million examinees university entrance examinations, Turkey, 2013.

Publications

1. **Tasdelen B.**, et al. "Assessment and mitigation of EMI from in-room equipment in the setting of interventional 0.55T MRI". ISMRM, 2023.
2. Nayak KS, Cui SX, **Tasdelen B**, et al. Body composition profiling at 0.55T: Feasibility and precision. Magnetic Resonance in Medicine. 2023;90(3):1114-1120. doi:10.1002/mrm.29682
3. **Tasdelen B.**, et al., "Analysis and mitigation of noise in simultaneous transmission and reception in MRI" MRM. 2021.
4. **Tasdelen B.**, et al., "Vector Modulator Based Active Compensation of Direct Feedthrough" International Workshop on Magnetic Particle Imaging, Würzburg, Germany, 2020.
5. **Tasdelen B.**, et al., "Noise Analysis for Simultaneous Transmission and Reception Enabled MRI Scanner", ISMRM, 2020, Sydney, Australia.
6. **Tasdelen B.**, et al., "Dynamic Decoupling for Simultaneous Transmission and Acquisition in MRI" Proc. Intl. Soc. Mag. Reson. Med. Vol. 27, 2019.
7. Atalar E., Taraghinia S, Ertan N. K., and **Tasdelen B.**, "Spatiotemporal magnetic field monitoring with hall effect sensors during the MRI scan," US20180292502A1, 11-Oct-2018.
8. Ariyurek C, **Tasdelen B**, Ider YZ, Atalar E. SNR Weighting for Shear Wave Speed Reconstruction in Tomoelastography. NMR in Biomedicine. 2021;34(1):e4413. doi:10.1002/nbm.4413

   There are 13 second authored abstracts. Those can be seen here: Publications