Deniz Karakay

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Education

University of Arizona — Tucson, AZ
Ph.D. in Electrical and Computer Engineering — Aug. 2023 - Present

Middle East Technical University — Ankara, Turkey
B.S. in Electrical Electronics Engineering — Sep. 2019 –Jun. 2023

Publications

[1] **D. Karakay**, B. P. Toner, A. Pugazhendhi, K. Johnson, K. Concha-Moore, M. Ferguson, *et al.*, "Accelerated and noise-robust carotid T1–T2 mapping using deep learning reconstruction", in *ISMRM Proceedings*, Accepted for presentation at ISMRM 2026. URL to appear., May 2026.

[2] **D. Karakay**, C. P. Ugonna, S. Matijevic, N.-k. Chen, T. P. Trouard, L. Ryan, *et al.*, "Microstructural alterations surrounding white matter hyperintensities in the precision aging network cohort", in *ISMRM Proceedings*, Accepted for presentation at ISMRM 2026. URL to appear., May 2026.

[3] D. Mitsouras, **D. Karakay**, S.-E. Kim, M. Lu, J. Schollenberger, A. Pugazhendhi, *et al.*, "Multi-center scan–rescan reproducibility of fast quantitative MRI of carotid atherosclerosis", in *ISMRM Proceedings*, Accepted for presentation at ISMRM 2026. URL to appear., May 2026.

[4] S. Zahra, S. R. French, J. C. Arias, M. Ally, H. Wiskoski, C. Escareno, **D. Karakay**, *et al.*, "In an older-age vascular cohort, carotid stenosis is associated with processing speed and executive function cognitive deficits, which correlate with p-tau217", *Alzheimer's & Dementia*, vol. 21, no. 11, e70893, Oct. 2025, https://alz-journals.onlinelibrary.wiley.com/doi/full/10.1002/alz.70893.

[5] **D. Karakay**, H. Wiskoski, E. Peckham, J. Arias, D. Patterson, K. Rayasam, *et al.*, "Atherosclerosis severity in the internal carotid artery is associated with elevated white matter lesion burden in the supplied brain territories", *ISMRM Proceedings*, May 2025, https://archive.ismrm.org/2025/1499.html.

[6] Y. Zhang, A. Bilgin, S. Gokce-Kafali, B. Toner, T. Delgado, E. Ahanonu, **D. Karakay**, W. Zhou, *et al.*, "Enhancing deep learning-based liver vessel segmentation on MRI with image translation techniques", *ISMRM Proceedings*, 2024, https://archive.ismrm.org/2024/1398.html.

[7] **D. Karakay**, M. Altbach, D. R. Martin, and A. Bilgin, "Impact of vessel removal on classification of chronic liver disease using radiomics features and quantitative T2 mapping", *ISMRM Proceedings*, 2024, https://archive.ismrm.org/2024/3093.html.

[8] J. Wei, **D. Karakay**, and A. Yilmaz, "A GIS-aided approach for geolocalizing an unmanned aerial system using deep learning", *IEEE Sensors*, 2022, https://arxiv.org/abs/2208.12251.

Research Experience

UA-MRI Lab at University of Arizona — Tucson, AZ
Graduate Research Assistant — Aug 2023 - Present

- Supervised by **Assoc. Prof. Dr. Ali Bilgin** and **Prof. Dr. Maria Altbach**
- Conducting research in computer vision, machine learning, and generative AI with applications in medical imaging (especially MRI), focusing on image reconstruction and segmentation.
- Currently developing a deep learning-based method for **noise-free T1 MRI reconstruction**.
- Investigating **White Matter Hyperintensities (WMHs)** in brain MRIs, contributing to a study correlating WMH burden with atherosclerosis severity. Designed segmentation workflows and supported model development for lesion detection and burden quantification
- Working on **Contrast Phase Classification for Abdominal CT** scans using deep and traditional machine learning to assist in scan standardization and downstream diagnosis.

METU Center For Image Analysis(OGAM) at METU Ankara, Turkey
Undergraduate Research Assistant Sep 2021 - Sep 2023

– Participated in a project supervised by **Prof. Dr. Aydın Alatan** to interpret and visualize the LIDAR data on a moving car by utilizing IMU data and external GPS data from mobile phone. Developed a mobile application to collect IMU and GPS data and utilized those data in MATLAB's toolbox.

Photogrammetric Computer Vision Lab (PCVlab) at Ohio State University Remote
Affiliated Researcher Feb 2021 - Apr 2023

– Participated in a project supervised by **Prof. Dr. Alper Yilmaz** to make geolocalization using only image processing in a UAV. Collected map data from Google Maps and Open Street Maps using Python with various classes to train the models based on image segmentation and GANs. Our work has been accepted to the SENSORS 2022 conference

Professional Experience

AiTerna Technologies Remote
Software & AI Engineer May 2022 – 2024
Built a GNN-based recommender pipeline and shipped a Flutter app with Firebase + GCP.

Micropsi Industries Berlin, Germany
Intern Jul 2022 – Oct 2022
Improved robotic-arm simulation tooling using Python, ROS, and Gazebo.

Gamer Arena Istanbul, Turkey
Part-time Software Engineer & Project Manager Jul 2020 – Nov 2021
Led delivery of special product features and coordinated execution across teams.

Awards & Achievements

- **Outstanding Performance Award** in Capstone Projects of METU EEE 2023 [**HK Tech**] Jun 2023
- **Global Top 50 Semi-Finalist** in Google Solution Challenge 2022 [**Peter**] May 2022
- **3rd Place in** Yıldız Bootcamp [**Peter**] Apr 2022
- **2205 TUBITAK Undergraduate** Scholarship Holder Mar 2022
- **Global Top 10 Finalists** in Google Solution Challenge 2021 [**QRegister**] Jun 2021
- **1st Place** in Hack for Planet with [**QRegister**] Feb 2021
- **Technical Writer** at GDevelop for Google Season of Docs 2020 [**Space Shooter**] Jan 2021
- **1st Place in Ankara** in TUBITAK's University Research Project Competition [**A Torch in Darkness**] Aug 2020
- **Apple Swift Student Challenge Winner** (WWDC'20 Scholar) [**Stop Pandemic**] Jun 2020
- **3rd Place in Turkey** in 49th TÜBİTAK High School Research Project Competition (2204-A) May 2018
- **Google Code-In 2016** Grand Prize Winner Jan 2017
- **Exhibitor** in Germany, **1st Place in Turkey** in Project IRRESISTIBLE Oct 2016

Volunteer & Extracurricular Activities

- **Open Source speeches** at **MLH Hackcon 2023, 2024**, **4 Corners CS Convening** 2023–Present
- **GitHub Campus Expert** at University of Arizona (prev at METU [2020-2023]) 2023–Present
- Mentor & Contributor at **SCoRe Lab** for **Google Summer of Code** & formerly **Google Code-In** 2016–2023
- **Google Developer Student Clubs Lead** at METU 2020

Skills

- **Programming** Python, MATLAB, Dart, C/C++, C#, Java, Swift, JavaScript, MySQL
- **ML & Imaging** PyTorch, TensorFlow, scikit-learn, NumPy, Pandas
- **Tools & Platforms** Linux, Git, Docker, GCP, Nginx, Firebase, MongoDB, REST APIs, CI/CD
- **Frameworks** Flutter, Django, Flask, Sanic, Node.js
- **Languages** Turkish (native), English (fluent), Spanish (intermediate), German (basic)