ONAT DALMAZ

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EDUCATION

Stanford University — Stanford, CA
Ph.D. Electrical Engineering — Machine Learning & Signal Processing — GPA 4.20/4.0
Advisors: Brian Hargreaves, Akshay Chaudhari — Sep 2023–June 2027 (expected)

Bilkent University — Ankara, Turkey
M.Sc. Electrical Engineering — GPA 4.00/4.0 — 2020 – 2023
B.Sc. Electrical Engineering — GPA 3.77/4.0 — 2016 – 2020
Turkey National University Entrance Exam Rank: 18th / 2.5 M (top 0.0007%).

EXPERIENCE

Research Assistant, Stanford — Sep 2023 – Present

• To quantify ***aleatoric* uncertainty** in deep learning-based MRI, I derived an unbiased estimator for the diagonal of the reconstruction-noise covariance by modelling it as a probabilistic Jacobian–covariance problem. I implemented this estimator using randomized linear sketches that efficiently sample neural-network Jacobians; delivers voxel-level variance maps **matching Monte-Carlo accuracy while running >10× faster and 20× lighter (ICML 2025)**.

• I developed an efficient computational pipeline for reconstructing high-dimensional, incomplete MRI data from incomplete measurements by solving a convex optimization problem with sparsity constraints, treating the measurement model as an implicit linear operator. I derived a stochastic estimation technique leveraging Conjugate Gradient methods that rapidly computes unbiased estimates of noise covariance diagonals, enabling scalable risk assessment and precise uncertainty quantification for large-scale systems (to be submitted to *IEEE TSP*).

Machine Learning Research Engineer — Hyperbee AI — 2022
Designed and trained Transformer architectures for high-dimensional complex-valued signal regression.

Research Assistant, Bilkent University — 2020 – 2023
Over a three-year research-intensive M.Sc. program, I drove a series of projects that reframed challenges as high–dimensional, rich medical data as probability-driven learning problems and solved them with transformer-based models. On the *time-series* side, I introduced a **Hierarchical Transformer** tailored for spectrogram representations of audio signals for respiratory COVID-19 screening and a **fused-window transformer** for multivariate BOLD signals. In *generative modeling*, I pioneered novel **transformer, diffusion-bridge, and score-based models** that beat GAN baselines in various inverse problems that arise in medical imaging. Together these studies showcased how stochastic modeling, transformer architectures, and time-frequency processing can be fused to extract, predict and synthesise high-dimensional signals across space, time and modality. My goal is to directly transfer these insights to broader machine learning and signal processing research.

Teaching Assistant — Bilkent University — 2020 – 2023
Courses: EEE 443 Neural Networks, CS 115 Introduction to Python
Guided UG/Grad students; taught labs & office hours; authored and graded quizzes and assignments.

PUBLICATIONS (See Google Scholar (1,300+ citations)

Selected Papers

• **O. Dalmaz** *et al.* "Efficient Noise Calculation in Deep Learning-based MRI Reconstructions." *ICML 2025*. [Online]. Available: openreview.net/forum?id=br7fTbnd16

- **O. Dalmaz** *et al.* "ResViT: Residual Vision Transformers for Multimodal Medical Image Synthesis." *IEEE TMI 2022*; also presented at *NeurIPS Med Imaging 2021.*
- **M. Ozbey***, **O. Dalmaz*** *et al.* "Unsupervised Medical Image Translation with Adversarial Diffusion Models." *IEEE TMI 2023*; also presented at *NeurIPS Med Imaging 2022.* (*equal lead)
- H. A. Bedel, I. Sivgin, **O. Dalmaz** et al. "BolT: Fused Window Transformers for fMRI Time Series Analysis." *Medical Image Analysis*, vol. 88, Aug 2023, 102841.
- I. Aytekin*, **O. Dalmaz*** et al. "COVID-19 Detection from Respiratory Sounds with Hierarchical Spectrogram Transformers," *IEEE Journal of Biomedical and Health Informatics*, vol. 28, no. 3, pp. 1273–1284, Mar. 2024. (*equal lead)
- **O. Dalmaz** et al. "One Model to Unite Them All: Personalized Federated Learning of Multi-Contrast MRI Synthesis." *Medical Image Analysis*, vol. 94, 103121 (2024); also presented at *NeurIPS Med Imaging 2023.*
- M. U. Mirza, **O. Dalmaz** et al. "Learning Fourier-Constrained Diffusion Bridges for MRI Reconstruction," *preprint* (To be submitted to *ICLR 2026*).
- K. Gonc, B. Saglam, **O. Dalmaz** et al. "User Feedback-based Online Learning for Intent Classification." *ACM ICMI 2023*, pp. 613–621. DOI: 10.1145/3577190.3614137

Book Chapter

• **O. Dalmaz**, T. Cukur, "Chapter 15: *Give Me That Other Image: Machine Learning for Image-to-Image Translation*," in *Machine Learning in MRI: From Methods to Clinical Translation*, Elsevier Press, 2025.

Patent

• **O. Dalmaz**, B. Hargreaves, A. Chaudhari, "Efficient Theoretical Noise Variance Estimation for Deep Nonlinear Inverse Models," US Provisional 63/784,409, filed Apr 7 2025.

OPEN SOURCE SOFTWARE SYSTEMS

- ResViT
- pFLSynth
- SynDiff
- HST

PROFESSIONAL SERVICE

- **Moderator**: ISMRM 2025 panel "Can We Trust AI as Our Tour Guide?"
- **Program Committee**: MICCAI workshops — ML in Clinical Neuroimaging, Deep Generative Models, DeCaF (2022–24); NeurIPS workshops — Medical Imaging Meets (2022–23), Vision Transformers (2022)
- **Reviewer**: AAAI FLUID WS (2025); ICLR Main (2023); ICML Main (2025); Journals — *Medical Image Analysis*, *IEEE TMI*, *IEEE TIP*, *IEEE TSP*, *IEEE TCI*, *IEEE JBHI*, *Neural Networks*, *MELBA*

SELECTED GRADUATE COURSEWORK (A / A+)

- Convex Optimization
- Image Reconstruction
- Machine Learning
- Deep Learning
- Information Theory
- Digital Signal Processing
- Signal Processing for ML

HONORS & AWARDS (selected)

- **ISMRM Magna Cum Laude Merit Award** 2025 · spotlight abstract (Honolulu)
- **Distinguished Reviewer** — IEEE TMI (2024)
- **Stanford Ph.D. Fellowship** 2023 – present · full tuition & stipend
- **Princeton Ph.D. Fellowship** (2023)
- **Yale Ph.D. Fellowship** (2023)
- **Best Paper** (Bilkent Grad Research Conf. 2022)
- **ISMRM Magna Cum Laude Merit Award** 2022 · spotlight abstract (London)
- TÜBİTAK Scientist Support Scholarship (M.Sc.)
- Bilkent Comprehensive Scholarship (2016-23)
- Turkish Prime-Ministry Fellowship (2016-20)
- Huawei "**Seeds for the Future**" Scholar (2018)
- Turkey Is Bank **"Golden Youth"** Award (2016)
- 2016 National Univ. Exam Rank **18** / 2.5 M