

Mustafa Arda Aydın

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About Me

I am an M.S. student at Bilkent University specializing in medical image analysis. I focus on the efficient adaptation of vision-language and foundation models across diverse clinical domains, with a particular interest in model interpretability and decision-making mechanisms.

Education

Bilkent University, Ankara, Turkey Master of Science in Electrical and Electronics Engineering	09/2024 - Present GPA: 3.91/4.00
Istanbul Technical University, Istanbul, Turkey Bachelor of Science in Electronics and Communication Engineering	09/2019 - 06/2024 GPA: 3.94/4.00 (Rank:2/134)
AGH University of Science and Technology, Kraków, Poland Erasmus+ Student in Electronics and Communication Engineering	02/2022 - 07/2022

Work Experience

Imaging and Computational Neuroscience (ICON) Lab, Ankara, Turkey <i>Graduate Research Assistant</i> Adaptation of Medical Vision-Language Models (VLMs): Developed an efficient, spatially aware adaptation framework for medical VLMs under Prof. Tolga Çukur. Consistently outperformed baseline fine-tuning techniques across multiple downstream tasks, including zero-shot classification, object detection, and semantic segmentation [Manuscript under review].	09/2024 - Present
ITU Vision Lab, Istanbul, Turkey <i>Undergraduate Researcher</i> Training-free Open-Vocabulary Semantic Segmentation: Developed a method to transform image-level knowledge in vision-language models (VLMs) into pixel-level representations through image-, text-, and architecture-level enhancements. Achieved state-of-the-art performance on multiple benchmarks for training-free semantic segmentation, resulting in a publication at CVPR Workshops 2025. Lesion Segmentation: Participated in the BONBID-HIE MICCAI 2023 challenge. Developed a novel transformation method that significantly improves the dice score for this lesion segmentation task and successfully presented our challenge solution at the BONBID-HIE2023 MICCAI Workshop. Tiny Object Segmentation: Developed a successful image segmentation model and compared some of the state-of-the-art image segmentation models for the bird's-eye view of aerial images of the campus under the supervision of Prof. Gözde Ünal.	08/2022 - 09/2024
ASELSAN, Ankara, Turkey <i>Summer Intern at Autonomous Vehicle Team</i> Semantic Segmentation: Worked on the possible implementation of the Segment Anything Model (SAM) for autonomous vehicles efficiently. Reduced the inference time and increased the quality of masks for some real-world applications.	07/2023 - 08/2023

Selected Publications

- M. Arda Aydın**, Melih B Yılmaz, Aykut Koç, and Tolga Çukur, "ACE-LoRA: Graph-attentive context enhancement for parameter-efficient adaptation of medical vision-language models," *arXiv preprint arXiv:2603.17079*, 2026.
- M. Arda Aydın**, Efe M. Cirpar, Elvin Abidinli, Gozde Unal, and Yusuf H. Sahin, "ITACLIP: Boosting training-free semantic segmentation with image, text, and architectural enhancements," in *Proceedings of the Computer Vision and Pattern Recognition Conference (CVPR) Workshops*, pp. 4142–4152, 2025
- M. Arda Aydın**, Elvin Abidinli, and Gozde Unal, "Segresnet based reciprocal transformation for bonbid-hie lesion segmentation" in *Trauma Thompson Challenge*, pp. 39–44, Springer, 2023.

Presentations

- 1. 1st BOston Neonatal Brain Injury Dataset for Hypoxic Ischemic Encephalopathy (BONBID-HIE) Lesion Segmentation Workshop (2023)
- 2. Computer Vision and Pattern Recognition Conference Workshops 2025, Nashville, TN, USA

Teaching Experience

Bilkent University, Ankara, Turkey

09/2024 - Present

Teaching Assistant

- **EEE 211 Analog Electronics:** Asking interview questions to students during laboratory sessions and grading the experiment reports.
- **EEE 102 Digital Logic Design:** Conducted student interviews during laboratory sessions, provided guidance on course projects, and graded laboratory reports.

Honors & Awards

- **Travel Grant:** Awarded a travel grant by the Scientific and Technological Research Council of Turkey (TÜBİTAK) to attend CVPR 2025.
- **Bilkent University Departmental Fellowship:** Full tuition waiver and stipend during the MSc program.
- **Best Paper Award Runner-Up:** Image Processing and Computer Vision Track, 34th Signal Processing and Communications Applications Conference (SIU 2026).
- **ITU Electronics and Communication Engineering Department:** Ranked second in the electronics and communication engineering department.
- **Erasmus+ Grant:** Granted to cover basic expenses during the exchange program (€1800)
- **Nationwide University Entrance Exam:** Ranked in the 0.1 percent among 2.5 million students in Turkey (2019)

Related Coursework

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|------------------------------|-----------------------------------|
| • Machine Learning | • Linear Algebra and Applications |
| • Neural Networks | • Medical Imaging |
| • Probability and Statistics | • Deep Generative Networks |
| • Computer Vision | • Deep Learning |

Skills

- **Technical Skills:** Python, C, C++, MATLAB, PyTorch, TensorFlow, Deep Learning, Computer Vision
- **Languages:** Turkish (Native), English (Full Proficiency)

Certificates

- **Neural Networks and Deep Learning on Coursera**
<https://coursera.org/share/efd7a165aada67644eba1aa9529decf9>
- **Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization on Coursera**
<https://coursera.org/share/bc41fab76e1fa7998791d83d3055a38f>
- **Structuring Machine Learning Projects on Coursera**
<https://coursera.org/share/99962e4a02f503ef48b57398641dd27b>