Melih **Darcan**

VIRTUAL HUMANS · 3D/4D COMPUTER VISION RESEARCHER

Ankara, Turkey

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Summary

Interested in mastering new tools, concepts, and programming languages, especially in 3D deep learning & math. My focus lies on human pose estimation, dataset creation, and reconstructing people wearing challenging clothing. Although I approach these problems through a scientific lens, the lens itself sometimes warps slightly, thanks to my 16-year history of folk dances, which keeps me grounded (and occasionally off-center).

Education

HU (Hacettepe University) · **GPA: 3.17** · **Minimum GPA: 2.0** · **Maximum GPA: 4.0**   *Sep. 2020 - Feb. 2025*

B.S. IN ARTIFICIAL INTELLIGENCE ENGINEERING   *Ankara, Turkey*

Machine Learning | **Deep Learning** | **Image Processing** | **Computer Vision** | **Bioinformatics**

Experience

Researcher   *Ankara, Turkey*

HACETTEPE UNIVERSITY BIOLOGICAL DATA SCIENCE LABORATORY   *Jul. 2022 - Oct. 2025*

- Developed, maintained and refactored **pypath**, utilizing python, GraphQL, and REST API by adding multiple dataset modules to assist bioinformatics researchers and reduce the time spent on data preprocessing.
- Developed a GraphQL API to give easier access to our Knowledge Graph Database, CROssBAR.
- Worked on LLM integration of the CROssBAR
- Built the server infrastructure of CROssBAR

Projects

Here are, **a selection** of my projects. Thanks to the university courses, I implemented various models / methods from scratch.

Iterative Closest Points   *Portfolio Project*

POINT CLOUD REGISTRATION · NON-RIGID DEFORMATION   *source*

- Implemented iterative closest points to align point clouds, without any given correspondences, calculating the non-rigid deformation. Utilized Chamfer Distance to efficiently compute correspondences & losses every iteration.

Procrustes Alignment   *Portfolio Project*

POINT CLOUD REGISTRATION · RIGID DEFORMATION   *source*

- Implemented procrustes alignment to align point clouds, given correspondences, calculating the rigid deformation. Utilized Singular Value Decomposition (SVD) to efficiently compute the optimal transformation matrix within the process.

AI Choreo Test Case   *Google Summer of Code*

MOTION-TEXT GENERATION · CONTRASTIVE LEARNING · SEMI-SUPERVISED LEARNING   *source*

- Inspired by GIT-Mol, developed a semi-supervised contrastive learning pipeline for motion-text generation with point-cloud motion data.

panostitch   *AIN433 - Computer Vision Lab.*

COMPUTER VISION · HOMOGRAPHY · RANSAC

- Employed SURF to extract descriptors and identify corresponding features across multiple images
- Filtered initial matches using RANSAC to eliminate outliers and accurately estimate homography matrices.
- Generated a seamless panorama image by applying inverse warping based on the calculated homography transformations.

pyrablend   *AIN432 - Image Processing Lab.*

IMAGE PROCESSING · BLENDING · IMAGE PYRAMIDS

- Utilized image pyramid representations to blend images at multiple resolutions, effectively minimizing artifacts and creating natural-looking composites.

DeTraffic   *Samsung Innovation Campus | inzva AI Projects #8*

TRAFFIC FLOW MANAGEMENT · (MULTI-AGENT) REINFORCEMENT LEARNING   *source*

- Leveraged Deep Q-Networks (DQN) with KAN layers to optimize traffic flow.
- The model demonstrates potential to decrease travel time, fuel consumption, and mitigate air/noise pollution – contributing to climate change mitigation efforts.
- Achieved more stable results compared to traditional DQN while utilizing fewer parameters.

Skills

Area of Interests	Virtual Humans, Computer Vision, Deep Learning, Machine Learning, Reinforcement Learning
AI	PyTorch, PyTorch 3D, PyTorch Geometric, Tensorflow
Programming Languages	Python, C, Java
Other	Linux System Admin, Bash, AstroJS
Languages	Turkish (Native), English (C1, IELTS 7/9, TOEFL 100/120)

Extracurricular Activity

Participant | Inzva
AI PROJECTS #9 PROGRAMME

Istanbul, Turkey
Feb. 2024 - May. 2024

- Proposed a pose estimation project for people with challenging clothes, like in folk dances.
- The project also includes dataset creation tasks, which I'm responsible for, because of my folk dances background.

Guide | Inzva
APPLIED AI PROGRAMME

Online
Apr. 2025

- Gave a presentation about Video Understanding & Virtual Humans to Applied AI program participants.

Guide | Samsung Innovation Campus
AI PROGRAMME

Online
Jan. 2025

- Gave a presentation about model deployment to Samsung Innovation Campus program participants.

Guide | Inzva
DEEP LEARNING STUDY GROUP PROGRAMME

Online
Oct. 2024

- Gave a presentation about CNNs to Deep Learning Study Group program participants.

Guide | Samsung Innovation Campus
AI PROGRAMME

Online
Jun. 2024

- Gave a presentation about model deployment to Samsung Innovation Campus program participants.

Participant | Inzva
AI PROJECTS #8 PROGRAMME

Istanbul, Turkey
Feb. 2024 - May. 2024

- Improved DeTraffic to help sustainable development goals number 11, 12, 13, and 3.
- Implemented Q Networks with KANs on traffic light control, which was a novel contribution.
- Got more stable and efficient results in our experiments.

Participant | Samsung Innovation Campus
AI PROGRAMME

Ankara, Turkey
Aug. 2023 - Dec. 2023

- Got training about AI, sustainable development goals and AI development lifecycle.
- Built DeTraffic to help sustainable development goals number 11, 12, 13, and 3.

Participant | Inzva
GOOGLE DEVELOPERS ML BOOTCAMP PROGRAMME

Online
Aug. 2023 - Dec. 2023

- Got training about AI and Tensorflow. Especially deepened our methodology on AI projects.
- Trained specifically for Tensorflow Developer exam, and joined to kaggle challenges.

Conferences

2024	**International Symposium on Health Informatics and Bioinformatics**, poster presented	*Istanbul, Turkey*
2024	**BAYOYO 2024 (Science Academy Artificial Learning Summer School)**, attended	*Ankara, Turkey*
2023	**International Symposium on Health Informatics and Bioinformatics**, attended	*Ankara, Turkey*
2022	**International Symposium on Health Informatics and Bioinformatics**, attended	*Mersin, Turkey*

Publications

2025	**Oxford University Press | Nucleic Acids Research**, Türei, D., Schaul J., Palacio-Escat N., Bohár B., Bai Y., Ceccarelli F., Çevrim E., Daley M., **Darcan M., ...,** Saez-Rodriguez J., (2025) OmniPath: integrated knowledgebase for multi-omics analysis	*Publication link*
2025	**ECCB 2025 Oral Presentation**, Şen, B., Ulusoy, E., **Darcan, M.**, Ergün M., Doğan, T., (2025) CROssBARv2: A Unified Biomedical Knowledge Graph for Heterogeneous Data Representation and LLM-Driven Exploration	*Project link*
2025	**Current Opinion in Structural Biology**, Ünlü, A.*, Ulusoy, E.*, Yiğit, M. G.*, **Darcan, M.***, Dogan, T., Protein Language Models for Predicting Drug-Target Interactions: Novel Approaches, Emerging Methods, and Future Directions, Sequences and Topology (2025), Elsevier	*Publication link*