Bilal Kabas

AI Research Engineer
M.Sc., Electrical-Electronics Eng.

Ankara, Turkey
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Scholar – GitHub – LinkedIn – Website

Work Experience

Nov '21–Present **Aselsan**
Ankara, Turkey AI Research Engineer

- Developing deep learning models for acoustic signal classification
- Designing algorithms for fiber optic DAS-based threat classification
- Working on high-speed weigh-in-motion (HSWIM)
- Worked on earthquake localization and early warning using DAS

Sep '22–Present **National Magnetic Resonance Research Center (UMRAM)**
Ankara, Turkey Researcher

- Developing generative models: diffusion, GAN, NeRF
- Designing deep learning architectures for image synthesis and reconstruction
- Applying deep compressed sensing for accelerated MRI and sparse-view CT
- Working on visual language models: visual feature alignment, instruction fine-tuning

Feb '20–Nov'21 **Distributed Intelligent Robotics Estimation & Control Lab**
Kayseri, Turkey Undergraduate Researcher (Supervisor: Samet Guler)

- Worked on autonomous UAV navigation and mobile robotics
- Developed deep reinforcement learning algorithms for UAV source seeking in occluded environments

June '21–July '21 **Aselsan**
Ankara, Turkey Intern

- Implemented video processing algorithms in VHDL
- Worked on convolutional neural network implementation on FPGAs

Education

2022–Present **Bilkent University**
Ankara, Turkey M.Sc., Electrical-Electronics Engineering, **GPA:** 3.87, **Advisor:** Tolga Cukur

2017–2022 **Abdullah Gül University**
Kayseri, Turkey B.Sc., Electrical-Electronics Engineering, **GPA:** 3.98, *Valedictorian*

Publications

2024 B. Kabas, V.A. Nezhad, S. Ozturk, E.U. Saritas, and T. Çukur, "**Physics-Driven Autoregressive State Space Models for Medical Image Reconstruction**," *arXiv:2412.09331 [eess.IV]*, 2024. [Online]. Available: https://arxiv.org/abs/2412.09331

2024 O.F. Atli, B. Kabas, F. Arslan, M. Yurt, O. Dalmaz, and T. Çukur, "**I2I-Mamba: Multi-modal medical image synthesis via selective state space modeling**," *arXiv:2405.14022 [eess.IV]*, 2024. [Online]. Available: https://arxiv.org/abs/2405.14022

2024 (Submitted, Medical Image Analysis) F. Arslan*, B. Kabas*, O. Dalmaz, M. Ozbey, and T. Çukur, "**Self-Consistent Recursive Diffusion Bridge for Medical Image Translation**," *arXiv:2405.06789 [eess.IV]*, 2024. [Online]. Available: https://arxiv.org/abs/2405.06789

2024 B. Kabas, F. Arslan, V. A. Nezhad, and T. Çukur, "**Multi-contrast MR image synthesis with a Brownian diffusion model**," *32nd Signal Processing and Communications Applications Conference (SIU)*, IEEE, 2024.

2024 V. A. Nezhad, G. Elmas, F. Arslan, B. Kabas, and T. Çukur, "**Generalizable deep MRI reconstruction with cross-site data synthesis**," *32nd Signal Processing and Communications Applications Conference (SIU)*, IEEE, 2024.

2022 (Single-authored) B. Kabas, "**Autonomous UAV Navigation via Deep Reinforcement Learning Using PPO**," *30th Signal Processing and Communications Applications Conference (SIU)*, IEEE, 2022.

2021 A. F. Hacan*, B. Kabas*, and S. Oguten*, "**Design Optimization of a Three-Phase Transformer Using Finite Element Analysis**," *arXiv:2201.11769 [eess.SY]*, 2022.

Open Source Projects

Sep '21–Oct'22 **Autonomous Navigation for Quadcopters via Deep Reinforcement Learning**
- Techs: *PyTorch, AirSim, Unreal Engine*. Link: GitHub

Dec '20–Feb '21 **Optimization of QPSK-based Communication Systems Using Deep Learning**
- Techs: *Keras, LabVIEW, USRP*. Links: GitHub, ResearchGate

Dec '20–Feb '21 **PID Controller Optimization for Low-cost Line Follower Robots**
- Techs: *C, STM32*. Links: Arxiv, GitHub

Mar '20–Apr '20 **Comparative Analysis of Full Adder Cells**
- Techs: *LTSpice, Proteus*. Link: ResearchGate

Oct '19–Jan '20 **ECG Signal Acquisition and Data Processing (Hardware & Software)**
- Techs: *MATLAB, Signal Processing Toolbox, Proteus*. Link: GitHub

Competitions

May '20–Sep '20 **2020 TUBITAK International UAV Competition**
- Developed an autonomous quadcopter
- Designed and developed algorithms, software as well as mechanical parts

Computer Skills

Languages	Python, MATLAB, C/C++, JavaScript
Libraries	Pytorch, Tensorflow, OpenCV, Scikit-learn, SciPy, Numpy, Pandas, Lightning
Softwares	Simulink, LabVIEW, Unreal Engine
Hardwares	NVIDIA DGX, STM32, Raspberry Pi, Pixhawk
Platforms	Windows, Linux, WSL2
Web	Django, Flask, HTML, CSS
Others	Git, Docker, Hugging Face, Weights & Biases, ROS, Microsoft AirSim, LaTeX

Languages

English, Advanced

Turkish, Native