Ozan Karaali

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Experience

Aalborg University — Copenhagen, Denmark
Ph.D. Fellow - Machine Learning & Distributed Systems — *10/2023 – 10/2026*

- Architected end-to-end 5G-connected prosthetic control system integrating computer vision, edge computing, and real-time actuation; validated with 13 participants achieving **36% faster task completion** vs. manual control
- Built complete software stack: multi-threaded Python server for ML inference (YOLOv11, TensorRT), Raspberry Pi 5 client with WebSocket communication, and 5G/srsRAN network layer achieving **520+ Mbps throughput**
- Benchmarked 8 VLMs (GPT-4, Claude, Gemini) for prosthetic grasp inference with structured JSON outputs
- Teaching Assistant for Computer Networks; Internal Co-examiner for IoT course

BMW Group — Munich, Germany
Product Developer - ML/AI & HPC — *09/2021 – 10/2022*

- Project EVOLVE (EU Horizon R&D): Optimized ride-hailing algorithms using HPC parallelization, achieving **50% runtime reduction** (1200s to 600s), ensuring project completion and EU compliance
- Developed Streamlit/Plotly analytics dashboard for bidirectional EV charging error analysis

TU Munich - CAMP — Munich, Germany
Master Thesis Student - Deep Learning Research — *01/2023 – 05/2023*

- Developed 2 novel deep learning super-resolution methods (Swin Transformer, HAT-NAF) for medical imaging
- Outperformed state-of-the-art: PSNR 33.67→35.39 (+5%), SSIM 0.89→0.92 (+3.4%)

DFKI (German Research Center for AI) — Kaiserslautern, Germany
Research Assistant — *10/2022 – 03/2023*

- Enhanced metis-II AI framework: CI/CD pipelines, OOP refactoring, business rule editor for graph data validation

TU Munich - Chair of Architectural Informatics — Munich, Germany
Interdisciplinary Project Student — *02/2022 – 08/2022*

- Designed LSTM/FCNN network for real-time architectural design prediction (F1: 0.95 val, 0.80 test); migrated TensorFlow→PyTorch with Lightning AI

HAVELSAN — Ankara, Turkey
ML Engineering Intern — *09/2019 – 01/2020*

- Developed GStreamer filter plugin bridging C++/Python (Boost::Python, GIL handling) for real-time OpenCV frame processing; trained image classification models using Caffe in multi-GPU Docker environment

Education

Aalborg University — Copenhagen, Denmark
Ph.D in Electronic Systems | 5G, Computer Vision, Edge Computing, Assistive Robotics — *10/2023 – 10/2026*

Technical University of Munich — Munich, Germany
M.Sc. in Informatics | Computer Vision | ***GPA: 1.9/1.0 (German Scale)*** — *10/2020 – 05/2023*

Abdullah Gül University — Kayseri, Turkey
B.Sc. in Computer Engineering | ***GPA: 3.68/4.0*** — *09/2016 – 01/2020*

Publications

ICAT 2025 "Using Visual Language Models to Control Bionic Hands: Assessment of Object Perception and Grasp Inference"
IEEE EMBC 2025 "5G-Enabled Smart Prosthetic Hand: Connectivity Analysis and Assessment"
IEEE IoT Magazine 2025 "Enabling Next-Generation Cloud-Connected Bionic Limbs Through 5G Connectivity"
Master's Thesis "Learning-Based Ultrasound Image Super-Resolution" - Outperformed SOTA (+5% PSNR, +3.4% SSIM)

Skills

Languages: Python, C/C++, JavaScript/TypeScript, Rust, Java, Kotlin
ML/Systems: PyTorch, TensorFlow, TensorRT, OpenCV, YOLO, srsRAN, Open5GS, GStreamer, Docker, Kubernetes
Tools: Linux, AWS, GCP, Git, CI/CD, React, Node.js, Flask

Projects

QiTV/PiTV | Cross-platform IPTV clients | Python/PySide, Electron/React | *GitHub*
Kargom Nerede | Parcel tracking app | React Native, Flask | 10K+ downloads, 1.5K MAU | *Archive*