Ozan Karaali

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Experience

TU Munich - Chair of Computer Aided Medical Procedures Jan 2023 – May 2023
Master Thesis Student *Munich, Germany*

- Authored two novel deep learning SR methods for ultrasound image super-resolution, utilizing PyTorch.
- Achieved significant metric improvements, outperforming the previous state-of-the-art model in PSNR value from 33.67 to 35.39 and SSIM from 0.89 to 0.92.

Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI) Oct 2022 – Mar 2023
Research Assistant *Kaiserslautern, Germany*

- Implemented a business rule editor for consistency checking in graph data of building relation maps.
- Enhanced consistency checker of the metis-II by implementing CI/CD pipelines and OOP refactoring.

BMW Group Sep 2021 – Oct 2022
Product Developer *Munich, Germany*

- Project EVOLVE (Research and Development): Leveraged parallelization and high-performance computing (HPC) techniques to enhance ride-hailing optimization algorithms. Key contributions resulted in a substantial increase in computational efficiency, reducing simulation time from 1200 seconds to 600 seconds - a 50% time reduction. This significant achievement contributed to meeting critical project deadlines and ensured successful completion in compliance with European Union regulations.
- Project GeoCoding QA: Evaluated geocoding quality by various metrics across different providers.
- Project Powerpool (Bidirectional Charging): Streamlined error analysis in the Powerpool bidirectional charging backend system through the development of a Streamlit and Plotly tool.

TU Munich - Chair of Architectural Informatics Feb 2022 – Aug 2022
Interdisciplinary Project Student *Munich, Germany*

- Transitioned the existing metis-II project "Deep Learning in the Architectural Design Process" from TensorFlow to PyTorch with Lightning AI, improving control and simplicity.
- Designed an LSTM/FCNN network to predict design intentions in real-time by a 0.8 F1-macro score on non-shuffled test set, enhancing metis-II's AI framework.

HAVELSAN Sep 2019 – Jan 2020
Long-Term Intern *Ankara, Turkey*

- Gained proficiency in neural network basics and image classification using Caffe on a multi-GPU Docker environment and created a Python-interpreting GStreamer filter plugin with C++ for video frame processing and improved a GUI application.

adesso Turkey Jul 2019 – Sep 2019
Intern *Istanbul, Turkey*

- Developed iOS applications using Swift and RxSwift and refactored an app from MVC to MVVM architecture using RxSwift and gained understanding of differences between Android and iOS development environments.

HAVELSAN Jun 2019 – Jul 2019
Intern *Ankara, Turkey*

- Developed a Python QT GUI application for video/image processing and began learning frame-by-frame video processing using GStreamer and OpenCV.

ISSD Jul 2018 – Sep 2018
Intern *Ankara, Turkey*

- Made a web application for analyzing traffic data collected from Bluetooth, using Flask, Pandas, and React.

Education

Technical University of Munich Oct 2020 – May 2023
M.Sc. in Informatics: ***GPA: 1.9/1 (German Grading)*** *Munich, Germany*

- **Area of Specialization:** Computer Vision
- **Supplemental Areas:** Machine Learning, Distributed Systems, Cloud Computing, High Performance Computing

Abdullah Gül University Sep 2016 – Jan 2020
B.Sc. in Computer Engineering: ***GPA: 3.68/4*** *Kayseri, Turkey*

Projects

PixBike | IDP: Pix2Pix model based on implementation of GrowBike | *GitHub*

PiTV | A cross-platform IPTV and STB player client written in Electron, React and Node.js and LevelDB. | *GitHub*

Voxel Carving Using ArUco Markers | Course Project: Reconstructs 3D objects from multiple images | *GitHub*

Kargom Nerede | A parcel tracking application written in React Native and Flask. 10K+ downloads. | *Play Store*

Coordinated Frequency Allocation in Wi-Fi Networks | Heuristic algorithm design for Erasmus+ EPIC | *Report*

YOLOv3-ReCaptcha | A proof of concept Recaptcha solver using YOLOv3. | *GitHub*

Yumak Language | Capstone Project: Highly concurrent and parallel programming language.| *GitHub*

YARCL: Yet Another React Chart Library | 16kB (gzipped) React chart library with SVG. | *GitHub*

Skills

Programming: Python, Rust, NodeJS, C, C++, Java, Kotlin

Frameworks/Libraries: PyTorch, TensorFlow, Keras, Numpy, Pandas, React, Flask, Django, Electron, GStreamer, OpenCV, Streamlit, Plotly, Lightning AI, OpenMPI, QT

Tools/Platforms: Git, Docker, Kubernetes, AWS, GCP, Linux, Windows, MacOS, CI/CD pipelines

Languages: Turkish (Native), English (Fluent), German (Elementary)

Publications

Thesis: Learning-Based Ultrasound Image Super-Resolution - 2023 | *Thesis*

Seminar Presentation: pi-GAN: Periodic Implicit Generative Adversarial Networks for 3D-Aware Image Synthesis - 2021 | *Blog Article*

Why Scene Groups Are Doing Software And Digital Media Piracy? - 2017 | *Blog Article*

Changing Human Perception to Be More Comfortable on Conversation with Robots - 2017 | *Blog Article*