

FATMA MERVE KARALI

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Education

- TUM, Master of Science Informatics, Munich** Oct 2020 – Aug 2023
- **Relevant Coursework:** Computer Vision, Deep Learning, Machine Learning
 - **GPA:** 1.6
- Koç University, BSc in Computer Engineering, Istanbul** Sep 2011 – Jun 2016

Work Experiences

- AI Researcher & Data Engineer, Motius GmbH, Munich** May 2021 - Sep 2023
- Collaborated in a dynamic research environment, contributing hands-on expertise in Python.
 - Engineered advanced deep learning architectures using PyTorch Lightning and TensorFlow.
 - Worked on the FunKI research project, leveraging deep learning frameworks to explore and optimize 5G network performance.
 - Implemented anomaly detection techniques for enhanced diagnostics in ultrasound images.
 - Contributed significantly to the 6G SKY research project, focusing on the explainability, interpretability, and robustness of deep learning networks.
 - Spearheaded the replacement/migration of relational databases to cloud infrastructure (AWS, GCP).
 - Executed tasks in Data Warehouse (DWH), ETL, and Big Data domains.
- Data Engineer, Incuda GmbH, Munich** Oct 2020 - May 2021
- Implemented and optimized end-to-end ETL processes, emphasizing extraction, CDC, load, recycle management, dimension management, and key management.
 - Enhanced frameworks for classical DWH architecture, improving efficiency with large datasets.
 - Assisted in documentation, analysis, quality assurance, testing, and operational aspects of ETL processes.
- Senior Data Engineer, Vodafone, Istanbul** June 2019 - Sep 2020
- Led the ETL workflow and processes as part of the DWH Reengineering project, designing and developing DevOps CI/CD pipeline and migration flows.
 - Developed productivity tools and automation, reviewed designs and code, and contributed to data preparation for datamining.
 - Leveraged cloud services on AWS and GCP to gather data from OLTP systems, ensuring scalability and efficiency.
 - Employed cloud-based optimization techniques on AWS and GCP to improve the efficiency and performance of database queries and processes.
- Senior Data Engineer, Garanti BBVA Technology, Istanbul** Jul 2016 - May 2019
- Managed ETL architecture, optimizing data processing for operational data.
 - Improved database performance through property optimization and mapping enhancements on ODI.
 - Developed finance applications using RDBMS systems (Oracle Database, IBM DB2) and Java for efficient data manipulation in multichannel communication.

Notable Projects

- Master Thesis, Robust techniques to enhance label propagation in noisy oversegmented point clouds and 2D images**
- **Supervised by:** PD Dr. Ing. Habil. Federico Tombari,
 - Developed a novel robust framework for weakly supervised 3D semantic segmentation, enabling accurate and resilient learning from noisy oversegmented point clouds and images. The framework leverages multi-modality to enhance label propagation and network robustness.
 - Integrated various robust loss functions and adjustment methods to handle label noise, significantly enhancing the network's learning capacity and achieving remarkable performance improvements on benchmark datasets.

Weakly-supervised Semantic Segmentation through Projective Cycle-consistency

- **Supervised by:** Prof. Dr. Nassir Navab
- The goal of this project is to perform semantic segmentation with sparse annotations by knowledge transfer between multiple 2D images and 3D point clouds with projective cycle consistency.

Weakly Supervised Prostate Cancer Score Prediction

- **Supervised by:** Prof. Dr. Nassir Navab
- The goal of this project is to predict prostate cancer by implementing the learning pipeline with self-supervised learning and transfer learning.

3D Object Part Segmentation with Self-supervised Learning, [Source Code](#)

- **Supervised by:** Prof. Dr. Angela Dai
- Proved that self-supervised learning can achieve state-of-the-art results with a very limited amount of labels.

Laboratory Diagnostics project

- Collaborated with a global team from a leading healthcare company to migrate lab diagnostic data into a Snowflake data lake.
- Set up ELT pipelines in Snowflake and rebuilt portions of the business logic to replicate KPIs and analytics.

Vodafone DWH Reengineering project

- Led the construction of ETL workflow and processes, designed and developed the DevOps CI/CD pipeline, and managed migration flows for DWH reengineering.

Data Manipulation for Multichannel Communication

- Collaborated with IBM on a project aimed at enhancing multichannel communication efficiency at Garanti Teknoloji.
- Developed custom Java packages to manipulate data effectively, enabling the creation of multiple files tailored for email and SMS channels.
- Implemented robust and scalable solutions to optimize the data transformation process, ensuring seamless integration with communication channels.
- Streamlined communication workflows, leading to improved delivery times and enhanced customer engagement.
- Successfully contributed to the project's overall success by providing innovative solutions to meet the dynamic communication needs of the organization.

Skills

Programming Languages:

- Python, Java, C/C++
- SQL, PL/SQL, R, Matlab

Frameworks/Libraries:

- PyTorch, Tensorflow, PyTorch Lightning, NumPy, Pandas

Cloud Platforms:

- AWS, GCP

Tools:

- Snowflake, Airflow, Oracle Data Integrator (ODI)
- Hadoop, Spark, Ab Initio, GitHub
- Linux, Toad

Research Interests:

- Semantic Segmentation
- Unsupervised and Self-supervised Learning
- Learning with limited annotations
- Learning with multi-modal data
- Explainable AI, Trustworthy and Responsible AI