

# FATMA MERVE KARALI

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## Education

<b>TUM, Master of Science Informatics, Munich</b>	Oct 2020 – Aug 2023
<ul style="list-style-type: none"><li>• <b>Relevant Coursework:</b> Computer Vision, Deep Learning, Machine Learning</li><li>• <b>GPA:</b> 1.6</li></ul>	
<b>Koç University, BSc in Computer Engineering, Istanbul</b>	Sep 2011 – Jun 2016

## Work Experiences

<b>AI Researcher &amp; Data Engineer, Motius GmbH, Munich</b>	May 2021 - Sep 2023
<ul style="list-style-type: none"><li>• Collaborated in a dynamic research environment, contributing hands-on expertise in Python.</li><li>• Engineered advanced deep learning architectures using PyTorch Lightning and TensorFlow.</li><li>• Worked on the FunKI research project, leveraging deep learning frameworks to explore and optimize 5G network performance.</li><li>• Implemented anomaly detection techniques for enhanced diagnostics in ultrasound images.</li><li>• Contributed significantly to the 6G SKY research project, focusing on the explainability, interpretability, and robustness of deep learning networks.</li><li>• Spearheaded the replacement/migration of relational databases to cloud infrastructure (AWS, GCP).</li><li>• Executed tasks in Data Warehouse (DWH), ETL, and Big Data domains.</li></ul>	
<b>Data Engineer, Incuda GmbH, Munich</b>	Oct 2020 - May 2021
<ul style="list-style-type: none"><li>• Implemented and optimized end-to-end ETL processes, emphasizing extraction, CDC, load, recycle management, dimension management, and key management.</li><li>• Enhanced frameworks for classical DWH architecture, improving efficiency with large datasets.</li><li>• Assisted in documentation, analysis, quality assurance, testing, and operational aspects of ETL processes.</li></ul>	
<b>Senior Data Engineer, Vodafone, Istanbul</b>	June 2019 - Sep 2020
<ul style="list-style-type: none"><li>• Led the ETL workflow and processes as part of the DWH Reengineering project, designing and developing DevOps CI/CD pipeline and migration flows.</li><li>• Developed productivity tools and automation, reviewed designs and code, and contributed to data preparation for datamining.</li><li>• Leveraged cloud services on AWS and GCP to gather data from OLTP systems, ensuring scalability and efficiency.</li><li>• Employed cloud-based optimization techniques on AWS and GCP to improve the efficiency and performance of database queries and processes.</li></ul>	
<b>Senior Data Engineer, Garanti BBVA Technology, Istanbul</b>	Jul 2016 - May 2019
<ul style="list-style-type: none"><li>• Managed ETL architecture, optimizing data processing for operational data.</li><li>• Improved database performance through property optimization and mapping enhancements on ODI.</li><li>• Developed finance applications using RDBMS systems (Oracle Database, IBM DB2) and Java for efficient data manipulation in multichannel communication.</li></ul>	

## Notable Projects

<b>Master Thesis, Robust techniques to enhance label propagation in noisy oversegmented point clouds and 2D images</b>
<ul style="list-style-type: none"><li>• <b>Supervised by:</b> PD Dr. Ing. Habil. Federico Tombari,</li><li>• 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.</li><li>• 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.</li></ul>

### ***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.

### ***Siemens Healthineers 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 and Deloitte 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