Cavit **Cakir**

Munich, Germany, 80809
(+49) 176 32231832 | cavitcakir3@gmail.com | cavitcakir | cavitcakir

Education

Technical University of Munich (TUM)
Munich, Germany

Master of Science in Informatics — *Oct 2021 - Apr 2024*

- **Specializations:** *Computer Vision, Natural Language Processing (NLP), Machine Learning, Artificial Intelligence (AI)*
- **Grade:** 2.0/5.0 *(German grading system, 1.0 highest - 5.0 lowest)*

Sabanci University
Istanbul, Turkey

Bachelor of Science in Computer Science and Engineering — *Sep 2016 - Jun 2021*

- **Graduation Project Area:** *Natural Language Processing (NLP)*
- **CS GPA:** 3.78/4.0 *(US grading system, 4.0 highest - 0.0 lowest)*

Skills

Programming Python, C++, JavaScript | Pytorch, Numpy, Pandas, Tensorflow, Git, Docker, React, Node.js, SQL, NoSQL

Natural Languages Turkish (*native*), English (*advanced*), German (*basic*)

Experience

Machine Learning Engineer
Munich, Germany

Quasara GmbH | Python, Pytorch, Transformers — *May 2024 - Current*

Master Thesis Student
Ingolstadt, Germany

CARIAD | Python, Pytorch, Transformers, NeRF | View Thesis — *May 2023 - Dec 2023*

- Title: Self-Supervised Feature Learning for 3D LiDAR Semantic Segmentation with Neural Radiance Fields (NeRFs)
- Conducted under CARIAD, the automotive software company of Volkswagen, focusing on the *autonomous driving domain.*
- Managed the entire project lifecycle, from data preprocessing to the novel application of *Neural Radiance Fields (NeRFs)* and *3D LiDAR models*, demonstrating a comprehensive approach to complex challenges in the field.
- Utilized state-of-the-art techniques to significantly reduce the reliance on labeled datasets in autonomous driving, demonstrating the potential for more efficient and scalable model training methodologies.

Computer Vision Engineer Working Student
Munich, Germany

Quasara GmbH | Python, Pytorch, Transformers — *Dec 2022 - May 2023*

- Led the end-to-end development of a *Damage Classification project*, from initial data preprocessing to model training and implementation, significantly enhancing image analysis performance by utilizing state-of-the-art transformer models. This role showcased not only strong project ownership and technical expertise but also proficiency in applying cutting-edge AI technologies in practical applications.
- Facilitated communication with the client company through regular updates, in-depth discussions on findings, and comprehensive presentations of model outcomes, demonstrating exceptional client engagement and presentation skills.

Natural Language Processing (NLP) Intern
Istanbul, Turkey

FineSci Technology | Python, Pytorch, Transformers — *Jul 2020 - Oct 2020*

- Contributed to a *News Classification and Clustering project* by focusing on the classification of news using NLP techniques.
- Utilized state-of-the-art transformer language models to classify news articles, showcasing expertise in applying cutting-edge NLP technologies.

Undergraduate Teaching Assistant
Istanbul, Turkey

Sabanci University | C++, Teaching — *Feb 2019 - Feb 2020*

- Independently managed lab sessions for 20 - 30 students, providing hands-on support and guidance, alongside offering personalized mentoring during office hours to enhance students' understanding and engagement with course materials.
- Utilized C++ as the primary programming language to facilitate practical learning experiences in the *Introduction to Computing* course, demonstrating deep technical knowledge and application skills.

Selected Projects in Computer Vision

Implementation of Panoptic Neural Field
Technical University of Munich

Advanced Practical Course | Python, Pytorch, NeRF | View Project — *Oct 2022 - Mar 2023*

- Implemented the *Panoptic Neural Field (PNF)* paper from scratch using *Kaolin Wisp* and the *KITTI 360 dataset*, demonstrating initiative and expertise in translating theoretical concepts into practical, executable code in the absence of implementations.
- Optimized the *PNF* architecture for enhanced performance, employing advanced techniques to achieve significant improvements in model efficiency and accuracy, showcasing my ability to innovate and improve upon existing methodologies.

3D Perception for Autonomous Driving Survey

Technical University of Munich

Advanced Seminar Course | Research | View Project

Apr 2022 - Sep 2022

- Conducted in-depth research on *3D Object Tracking Methods*, with a particular focus on utilizing infrastructure sensors. This involved a comprehensive comparison of cutting-edge methodologies presented in recently published papers from top-tier conferences, demonstrating my analytical skills and ability to synthesize complex information.
- Written a survey paper that encapsulates the findings and insights derived from comparing recent advancements in 3D object tracking.

Improving Point Cloud Transformer using Curve Aggregation

Technical University of Munich

ML for 3D Geometry Course Project | Python, Pytorch, Transformers | View Project

Apr 2022 - Sep 2022

- Improved the shape analysis capabilities of a *Point Cloud Transformer* by implementing a *Curve Aggregation* method, showcasing my ability to enhance model performance for detailed 3D point cloud processing. This novelty led to more accurate shape interpretations on the *ShapeNet Parts* dataset.
- Successfully converted the *Point Cloud Transformer*'s implementation from *Jittor* to *PyTorch*, demonstrating technical proficiency and versatility in adapting complex models to widely used frameworks.

Skin Cancer Classification

Sabanci University

Machine Learning Course | Python, Tensorflow | View Project

Feb 2020 - Jun 2020

- Used transfer learning techniques to facilitate early diagnoses of skin cancer through image analysis of skin segments. This approach enhanced the accuracy and reliability of diagnostic processes.

Selected Projects in NLP

NLP and Knowledge Graphs for Research Cluster Prediction and Analysis

Technical University of Munich

TUM-DI-LAB Interdisciplinary Project | Python, Pytorch, Transformers | View Project

Oct 2022 - Mar 2023

- Participated in *Unsupervised Classification of Research Papers Project* and proposed a novel *Hierarchical Classification Method* while successfully applying existing methods.
- Used the cutting-edge *SPECTER* embedding model to enhance the quality of embeddings substantially. This choice enabled a more precise and nuanced understanding of research paper content, contributing to the project's success.

Emotional Clustering of Social Media Users

Technical University of Munich

Advanced Practical Course | Python, Pytorch, Transformers, BERT | View Project

Apr 2022 - Sep 2022

- Used the pre-trained *BERT model*, extracted embeddings to cluster users based on their textual data. This approach demonstrated my proficiency in utilizing advanced NLP techniques for user segmentation.
- Preprocessed Reddit users' posts to align with the pre-trained *BERT model*'s requirements, showcasing my ability to prepare and adapt large-scale datasets for complex NLP tasks.
- Applied a variety of *Dimensionality Reduction Methods*, including *HDBSCAN* and *KMeans*, to analyze and cluster high-dimensional data efficiently.

Meeting Scheduler Chatbot

Sabanci University

Bachelor's Graduation Project | Python, JavaScript, React, Node.js, Docker | View Project

Sep 2020 - Jun 2021

- Developed an advanced chatbot utilizing the *RASA Bot Framework*, incorporating pre-trained natural language understanding methods to accurately process and interpret user inputs. This approach showcased my ability to use state-of-the-art AI technologies for creating interactive and intelligent conversational agents.
- Implemented a graphical user interface for the chatbot using *React* and *Node.js*, encapsulated within *Docker* containers for ease of deployment and scalability. This end-to-end development highlights my proficiency in full-stack development and my commitment to delivering robust, scalable applications.

Lexicon and Rule-based Named Entity Recognition (NER)

Sabanci University

NLP Course Project | Python | View Project

Sep 2020 - Nov 2020

- Collected and preprocessed Turkish and English datasets with tagged data for the lexicon.
- Developed 25 regular expression (regex) patterns for efficient entity recognition and data extraction tasks.
- Achieved first place in class ranking, demonstrating academic performance and mastery of subject matter.