

# Cavit Çakır

MACHINE LEARNING ENGINEER

Munich, Germany

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## Summary

As a recent Master's graduate in Informatics, I bring a comprehensive background in Computer Science, with specialized expertise in *Computer Vision*, *Natural Language Processing (NLP)*, *Machine Learning*, and *Artificial Intelligence (AI)*. My academic pursuits have been complemented by hands-on experience in programming languages such as *Python* and *C++*, and proficiency in utilizing modules like *PyTorch*, *numpy*, and *TensorFlow* for developing advanced AI solutions. My professional experience spans working in the domains of *Computer Vision* and *NLP* across two different companies, where I applied my skills to solve real-world problems. My master's thesis, which focused on autonomous driving through computer vision, further underscores my capability to tackle complex challenges in *AI*. As I seek my first full-time opportunity, I am eager to bring my unique blend of academic knowledge, practical experience, and passion for technology to make a meaningful impact in the field.

## Skills

**Programming** Python, C++, JavaScript · Pytorch, Numpy, Tensorflow, git, Docker, React Native, Nodejs, mySQL  
**Natural Languages** Turkish (*native*), English (*advanced*), German (*basic*)

## Experience

### Quasara GmbH

Remote · Munich/Germany

COMPUTER VISION ENGINEER WORKING STUDENT

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.

### FineSci Technology

Remote · Istanbul/Turkey

NATURAL LANGUAGE PROCESSING (NLP) INTERN

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.

### Sabanci University

Istanbul/Turkey

UNDERGRADUATE TEACHING ASSISTANT

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.

## Education

### Technical University of Munich

Munich, Germany

MASTERS'S DEGREE INFORMATICS

Oct. 2021 - Mar. 2024

- **Specializations:** *Computer Vision*, *Natural Language Processing (NLP)*, *Machine Learning*, *Artificial Intelligence*
- **Grade:** 2.0/5.0 (*German Grading System*)

### Sabanci University

Istanbul/Turkey

BACHELOR'S DEGREE COMPUTER SCIENCE AND ENGINEERING

Sep. 2016 - Jun. 2021

- **Graduation Project Area:** *Natural Language Processing (NLP)*
- **Major GPA:** 3.78/4.0 (*US Grading System*)

## Selected Projects in Computer Vision

### Self-Supervised Feature Learning for 3D LiDAR Semantic Segmentation with NeRFs

Munich/Germany

MASTER'S THESIS · TECHNICAL UNIVERSITY OF MUNICH

May. 2023 - Dec. 2023

- Conducted my Master's thesis 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.

## Implementation of Panoptic Neural Field

Munich/Germany

ADVANCED PRACTICAL COURSE · TECHNICAL UNIVERSITY OF MUNICH

Oct. 2022 - Mar. 2023

- Implemented the *Panoptic Neural Field (PNF)* paper from scratch using *Python*, *Pytorch*, *Kaolin Wisp* and the *KITTI 360 dataset*, demonstrating initiative and expertise in translating theoretical concepts into practical, executable code in the absence of pre-existing 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.

## Improving Point Cloud Transformer using Curve Aggregation

Munich/Germany

MACHINE LEARNING FOR 3D GEOMETRY COURSE PROJECT · TECHNICAL UNIVERSITY OF MUNICH

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.

## 3D Perception for Autonomous Driving Survey

Munich/Germany

ADVANCED SEMINAR COURSE · TECHNICAL UNIVERSITY OF MUNICH

Oct. 2022 - Apr. 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.

## Skin Cancer Classification

Istanbul/Turkey

MACHINE LEARNING COURSE · SABANCI UNIVERSITY

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

Munich/Germany

TUM-DI-LAB INTERDISCIPLINARY PROJECT · TECHNICAL UNIVERSITY OF MUNICH

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

Munich/Germany

ADVANCED PRACTICAL COURSE · TECHNICAL UNIVERSITY OF MUNICH

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

Istanbul/Turkey

BACHELOR'S GRADUATION PROJECT · SABANCI UNIVERSITY

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.