

Bilhan Burak Usta

✉ usta19@itu.edu.tr ☎ 05511267518 🔗 linkedin.com/burakusta 🐙 github.com/burakusta

Education

Istanbul Technical University, Physics Engineering
GPA: 2.95/4

2020 – 2025

Experience

Metus Technology, Intern

08/2025 – Present

- Contributed to multimodal R&D for Media Asset Management, exploring vision, audio, and text integration.
- Fine-tuned OpenCLIP models using PyTorch to adapt generic vision encoders to specific media domains, enabling more accurate image-text matching than zero-shot baselines.
- Built a video-centric Retrieval-Augmented Generation (RAG) system with Milvus, transforming unstructured video archives into a searchable vector database.
- Prototyped speaker separation and diarization tools, extending the Milvus integration to store audio embeddings.
- Evaluated model inference latency and hardware requirements to assess the feasibility of deploying these pipelines into production.

Glass Research Group, Research Intern

01/2025 – 06/2025

- Contributed to research on luminescent and heavy metal oxide glasses for energy and communication technologies.
- Applied spectroscopic techniques to analyze lanthanide-doped glass nanocomposites for optoelectronics, solar energy, and radiation-shielding applications.
- Developed image optimization software for a volumetric display project using Python and OpenCV.
- Extracted and optimized contour points (x, y) for waveform generation in galvanometer mirrors, improving 3D rendering accuracy.
- Integrated results with Easywave software for dynamic holographic image projection.
- Collaborated on 3D display projects bridging computational methods with experimental glass research.

Technical Skills

Programming: Python, Matlab, FORTRAN, HTML/CSS/JS

Libraries/Tools: Pandas, NumPy, SciPy, Matplotlib, Scikit-Learn, OpenCV, PyTorch, LaTeX, OpenCLIP, BLIP-2, Excel

Techniques: Transfer Learning, Fine-tuning, Image-Text Retrieval, Caption Generation, Image Processing, Waveform Generation

Languages: English (C1), German (A2)

Projects

Data Science and Machine Learning Applications

- ETL for GDP Data: Automated data extraction and transformation using Python, BeautifulSoup, and SQLite.
- World's Largest Banks Analysis: Conducted data analysis and visualization using Pandas and Matplotlib.
- Interactive Finance Dashboard: Built a real-time finance dashboard with Plotly.

Certificates

IBM Data Analysis with Python, IBM Machine Learning with Python, IBM Python for Data Science, AI & Development, IBM Supervised Machine Learning: Regression and Classification, IBM Python Project for Data Science