

Curriculum Vitae

Personal Information & Correspondence

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Profile summary:

Kerem is a PhD candidate in Electrical and Computer Engineering at Technical University of Munich (TUM) in Germany and has worked as a machine learning researcher at TUMCREATE in Singapore since 2021. He has a strong background in **deep learning, computer vision, generative AI, and LLM-based multi-agent frameworks** with track-record in high impact journals and AI/CV conferences as well as hands-on experience in developing machine learning algorithms in **PyTorch, parallel programming in CUDA and developing MLOps pipelines**, from data acquisition, preprocessing/annotation and dataset curation to model training, selection, and deployment/monitoring in both cloud and on-premise environments.

His doctoral research produced an end-to-end and real-time image and data processing framework to discover new biomarkers to improve decision support for triage of high risk patients in emergency room, resulting in multiple publications and patent applications. In particular, he developed an **LLM-based multi-agent system for automated biomarker discovery with deep research grounding**. As an extension of his doctoral project, he spearheaded initiative, including **conducting customer interviews to identify potential applications, developing the business model, performing market research, and pitching to funding agency committee, resulted in securing a commercialisation grant** for his team. Kerem is now seeking **opportunities as a AI/ML engineer to transform cutting-edge research and engineering innovations into high-impact ML solutions**.

[Linkedin](#) | [Github](#) | [Google Scholar](#)

Work Experience

- Research Associate, TUMCREATE (Singapore), 08/2021 - Present
Skills: computer vision, natural language processing, deep learning, MLOps, image and data analysis, project management, proposal development for grants & fundings
- Research Associate, IZTECH (Turkey), 03/2019 – 07/2021
Skills: biomedical imaging, deep learning, computer vision, image and data analysis

Open-source Software & Project Contributions

- **Software development (TUMCREATE):** Real-Time and End-To-End Image and Data Processing Framework for Blood Cell Aggregate Biomarkers in Haematology Diagnostics using Digital Holographic Microscopy ([link](#))
- **MLOps:** Hospital Admission Prediction as a Web Service Deployed on AWS ([link](#))
- **LLMOps:** RAG-based Medical Assistant Chatbot Using Reciprocal Rank Fusion (RRF) ([link](#))
- **CUDA:** Implementation and optimization of machine learning algorithms ([link](#))
- **CV:** HuggingFace's Community Computer Vision Course ([link](#))

Education

- **Doctor of Philosophy:** Computer and Electrical Engineering, Technical University of Munich, Expected Graduation: Nov 2025
Ph.D. Dissertation: Development of a Phase Imaging Flow Cytometer for Cell Function Diagnostics
- **Master of Science:** Physics, Technical University of Munich (highest distinction) - 2023
M.Sc. Dissertation: Quality Control of Phase Microscopy for Imaging Flow Cytometry
- **Bachelor of Science:** Engineering Physics, Gaziantep University (salutatorian) - 2015
Graduation thesis: Flexible and printable radar sensor for autonomous vehicles

Computational Qualifications

- **Programming Languages:** Python, CUDA
- **Python Libraries and Deep Learning Frameworks:** PyTorch, HuggingFace, Numpy, Pandas, Matplotlib, Scikit-learn, Scipy, XGBoost, statsmodel
- **Computer Vision:** Convolutional Neural Network (CNN), Graph Neural Network (GNN), Vision Transformer (ViT), YOLO & SegmentAnything (SAM), Variational Autoencoder (VAE), **Contrastive Language Image Pretraining (CLIP)**, **Vision Language Model (VLM)**
- **Natural Language Processing:** Attention Mechanism, Transformers, **Deep Research**, **Multi/Agentic Graph Flow Design**, **Multi-step Reasoning**, **RLHF**, **LLM alignment**
- **Cloud Computing:** Amazon Web Services (AWS): EC2, S3, Lambda, Kinesis, RDS, CloudFormation, ECS, Bedrock, SageMaker
- **MLOps:** MLflow, Prefect, Flask, Grafana, Docker-compose, Terraform, CI/CD (GitHub Actions), Version Control (Git, GitHub)
- **LLMOps:** **Agent/Retrieval Augmented Generation (RAG)**, dataset generation (instruction), **fine-tuning (supervised fine-tuning (SFT), instruction, LORA)**. Libraries: Unsloth, Comet, Opik, Hugging Face, LangGraph, LangChain, LangSmith, AutoGen, DeepEval, Model Context Protocol (MCP)

Professional Certifications

- AWS Certified AI Practitioner by Amazon Web Services (AWS). Oct 2024
- AWS Certified Cloud Practitioner by Amazon Web Services (AWS). Oct 2024
- Large Language Model (LLM) – LLMOps by DataTalksClub. Oct 2024
- MLOps by DataTalksClub. Sep 2024

Awards & Grants

- **1st Places (creativity&public dataset) in Textarena Agent Hackathon by AI Tinkerers, March 2025**
- Master of Science in Physics with Highest Distinction by Technical University of Munich, March 2023
- 4th Place in National Patent Award by Turkish Patent and Trademark Office, 2020
- 3rd Place at Innovation in Biotechnology Contest by IZTECH, Turkey, 2018
- Salutatorian with honors - Class of 2015. Department of Engineering Physics, Gaziantep University, Turkey

Publications & Presentations

- **Delikoyun, K.,** et al., TriAgent: Automated Biomarker Discovery with Deep Research Grounding by LLM-Based Multi-Agent Collaborations for Enhanced Triage in Acute Care, (*in preparation*)**
- **Delikoyun, K.,** et al., Vision foundation model for phase flow cytometry enables label-free blood cell activation and aggregate analysis, (*in preparation*)**
- **Delikoyun, K.,** et al., RT-HAM: Real-Time Holographic Agent Microscopy – An End-to-End Foundation Model for Quantitative Phase Imaging in Haematology Diagnostics Towards Automated Discovery of Predictive Biomarkers in Acute Care, Computer Vision for Science Workshop, CVPR 2025
- **Delikoyun, K.,** et al., Real time deep learning phase imaging flow cytometry reveals blood cell aggregate biomarkers for haematology diagnostics, ([code repo](#) - [link](#))
- Liu, W., **Delikoyun, K.,** et al., OAH-Net: a deep neural network for efficient and robust hologram reconstruction for off-axis digital holographic microscopy. Biomedical Optics Express, 2025. 16(3): p. 894-909 ([link](#))
- **Delikoyun K.,** et al, Quantitative analysis of leukocyte activation in inflammatory acute conditions using digital holographic microscopy in Label-free Biomedical Imaging and Sensing (LBIS) 2025. 2025. SPIE ([link](#))
- Chen, Q., **Delikoyun K.,** et al. AI-Enhanced Detection of Cellular Aggregate Biomarkers For Point-of-Care Using Digital Holographic Microscopy. in 2024 IEEE International Conference on Bioinformatics and Biomedicine (BIBM). 2024. IEEE ([link](#))
- **Delikoyun, K.,** et al. Leukocyte Activation Assay Using AI-Enhanced Digital Holographic Microscopy. in 10th World Congress on Electrical Engineering and Computer Systems and Sciences (EECSS'24). 2024 ([link](#))
- **Delikoyun, K.,** et al. Digital holographic microscopy for label-free detection of NETosis. in Label-free Biomedical Imaging and Sensing (LBIS) 2024. 2024. SPIE ([link](#))
- **Delikoyun, K.,** et al. Label-free detection of rare cancer cells using deep learning and magnetic levitation principle. in Label-free Biomedical Imaging and Sensing (LBIS) 2021. 2021. SPIE ([link](#))
- **Delikoyun, K.,** et al., HologLev: A hybrid magnetic levitation platform integrated with lensless holographic microscopy for density-based cell analysis. Acs Sensors, 2021. 6(6): p. 2191-2201 ([link](#))
- **Delikoyun, K.,** et al., 2 Deep learning-based cellular image analysis for intelligent medical diagnosis, in Artificial Intelligence for Data-Driven Medical Diagnosis. 2021, De Gruyter. p. 19-54 ([link](#))

** The code repository is currently private but will be made publicly available upon the article's submission.

Patents

- Quantitative Analysis of Immune Cell and Platelet Aggregate Activation Using Realtime and End-To-End Image Processing Framework for Digital Holographic Microscopy. 10202500263R. Jan 28, 2025 (patent pending)
- Real-Time And End-To-End Image Processing Framework for Digital Holographic Microscopy. 10202401892U. Jun 25, 2024 (patent pending)
- Hybrid Detection and Separation of Target Cells Using Magnetic Levitation and Deep Learning, WO2023018398A1 ([link](#))

- Cell viability analysis and counting from holograms by using deep learning and appropriate lensless holographic microscope, WO2021076075A2 ([link](#))
- Protein Detection Using Lensless Holographic Microscopy Imaging Technique in a Magnetic Levitation Setup, WO2021086293A2 ([link](#))

<i>Languages</i>

English (Advanced), Turkish (Native)