

# Koray Ulsan

Machine Learning Engineer

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## EDUCATION

- M.Sc. Machine Learning** | University of Tübingen **GPA: 1.9 (Current)** — Tübingen, Germany Oct 2024 – Mar 2027  
Focus: Generalist, GenAI, Synthetic Data, Diffusion Models
- B.Sc. Computer Science** | University of Tübingen **GPA: 1.8 / 1.0** — Tübingen, Germany Oct 2020 – Sep 2024  
Final Thesis: Generating Professional Portraits from Amateur Photos via Personalization of Stable Diffusion  
Received Deutschlandstipendium

## PREVIOUS WORK

- Startup Engineer & Researcher (HiWi)** | University of Tübingen — Tübingen, Germany Nov 2024 – Jul 2025
- Architected **full-stack GenAI platform** as the foundational engineer to productionize bachelor thesis.
  - Orchestrated k-shot inference on a **HPC Slurm cluster** (8xL40S, 16xRTX 3090) using Redis and WebSockets to manage 100k+ jobs with estimated wait time report, having a peak throughput of **6,000 generations per hour**.
  - Developed a generative augmentation framework using InstantID and FLUX.1 Kontext, while improving facial resemblance via FaceNet, leading to a **first-author publication** at a [CVPR 2025 Workshop](#).
  - Optimized end-to-end generation latency to 14s by identifying bottlenecks via E2E profiling and implementing model pre-loading with a **“warm-node” queue management** system to eliminate cold-start latency.
  - Sustained a **49% activation rate** (visit-to-generation) for 2,500+ users, supporting high-retention cohorts with average 40+ monthly generations and 14–22 minute sessions for power users.
- Stack: Python (FastAPI, PyTorch, wandb), SQLite3, Redis, Slurm, ComfyUI, Vue.js, Apache2, Linux (Self-hosted); GitHub Actions

## SELECTED PROJECTS

- Delayed Auditory Feedback Online** | Real-Time DSP Web App (**Micro-SaaS**) Feb 2025 – Present
- Identified an underserved niche in speech therapy, built a low-latency audio engine to compete with native apps and physical DAF hardware, scaling to 500+ monthly users and 100h+ of session time with 65% returning traffic.
  - Directed SEO strategy to reach a **2.4 weighted average position** for core keywords, capturing 85% of organic traffic from Top 3 results with a 75% CTR on primary search intent.
- Stack: JavaScript (Web Audio API), HTML, CSS, Formspree; Google Search Console, Google Analytics
- Spurious Feature Annotation Platform** | Distributed Dataset Auditing System Apr 2023 – Jul 2023
- Architected a modular **HITL tool** to identify spurious features with multi-source API dataset enrichment, enabling researchers to label datasets via a centralized backend to offload model inference.
  - Steered a 4-person Agile team as **Technical Lead**, managing the end-to-end SDLC via Scrum.
- Stack: Python (PyTorch, timm, torchvision, HuggingFace, gradio, NumPy), JavaScript, Conda; GitHub Actions/Projects

## PUBLICATIONS

Ulsan, K., & Kiefer, B. (2025). [Generating Synthetic Data via Augmentations for Improved Facial Resemblance in DreamBooth and InstantID](#). *CVPR 2025 Workshop “Synthetic Data for Computer Vision”*.

## COURSEWORK

**Lectures:** Reinforcement Learning · Trustworthy ML · AI Safety · Benchmarks · Non-convex Optimization · NLP · LMs  
Gaussian Processes · Recurrent & Generative NNs · CUDA · C++ · DBMS (PostgreSQL/DuckDB) · SQL

Selected Coursework Projects:

- RL Paper: [Implementing TD3 with PER / Reward Shaping / Truncated n-Step Return Using SB3](#) Feb 2025
- Paper: [Understanding Disagreement in Peer Review](#) Feb 2025
- Code: Training a VAE on 64x64 images to achieve latent space vector disentangling Dec 2024
- Presentation: [Synthetic Image Generation with a focus on GANs](#) Dec 2023

**LANGUAGES:** Turkish (Native) · English (Professional, IELTS 7.0) · German (Advanced, DSD B2/C1)

**HOBBIES:** Homelab · 3D Printing · Adobe Photoshop · Stained Glass Art · Karate (Brown Belt)