

Kaan Aykurt

PhD Candidate · AI-driven Networked Systems · Technical University of Munich

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RESEARCH PROFILE

Ph.D. candidate working at the intersection of **AI for Networking** and **Networking for AI**. I design agentic LLM workflows and benchmarking frameworks for autonomous networks, and study communication bottlenecks in large-scale AI/ML systems. My expertise includes reproducible benchmarking on hardware testbeds, transport layer analysis, and network modeling with Graph Neural Networks.

EXPERIENCE

Chair of Communication Networks, Technical University of Munich

2022 – Now

Research and Teaching Assistant, Munich, Germany

- Developing agentic workflows for network troubleshooting, implementing the Model Context Protocol (MCP) for tool calling to interact with network emulators.
- Designed NetLLMBench, a reproducible benchmarking framework using Python and LangChain to evaluate LLM agents on network configuration tasks.
- Built and operated a Kubernetes experimental cluster and developed a custom pod autoscaler (HyPA) to optimize resource provisioning.
- Ranked 3rd in the GNNet2023 Challenge by designing Graph Neural Networks (GNNs) in PyTorch to predict latency on real-world datasets.
- Conducted hardware testbed measurements of TCP/IP and QUIC to analyze congestion dynamics in high-throughput applications.

Chair of Communication Networks, Technical University of Munich

2020 – 2022

Working Student, Munich, Germany

- Characterized traffic patterns of distributed training workloads (PyTorch DDP, MPI) to evaluate synchronization performance across RoCE and standard Ethernet.
- Modeled TCP congestion behavior in reconfigurable data centers to predict flow completion times and quantify topology switching impact.

IBM

2018 – 2019

IT Specialist, Istanbul, Türkiye

- Implemented automation workflows using Bash scripting and configured enterprise monitoring dashboards for operational insights.

TECHNICAL SKILLS

AI & ML: Python, PyTorch, Distributed Fine-Tuning, Hugging Face (Accelerate, PEFT/LoRA), vLLM

Networking: C++, RDMA (InfiniBand/RoCE), P4, eBPF, ns-3, Mininet, TCP/IP

Infrastructure: Docker, Kubernetes, Helm, Linux, Bash, Git, GitLab CI

EDUCATION

Technical University of Munich (TUM)

2022 – Now

Ph.D. Computer Engineering (Advisor: Prof. Dr.-Ing. W. Kellerer)

Technical University of Munich (TUM)

2019 – 2022

M.Sc. Communications Engineering

Koç University

2014 – 2019

B.Sc. Electrical & Electronics Engineering | B.A. Economics

SELECTED PUBLICATIONS

[Full List on kaanaykurt.me]

- **Agent-based Enhancement of Small Language Models**
- **NetLLMBench: A Benchmark Framework for LLMs in Networking**
- **When TCP Meets Reconfigurations: A Measurement Study**
- **Network Traffic Characteristics of ML Frameworks**

Under Review, 2025

IEEE NFV-SDN, 2024

IEEE TNSM, 2023

IEEE CNSM, 2021