MOHAMMAD AMIN ALI

Senior AI Engineer, AI Researcher and Technical Author

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LinkedIn, NeurIPS 2024 paper, Articles in AI-Thawra

PROFILE

I am a Senior AI Engineer with more than six years of experience in AI research and engineering. I build enterprise AI systems from the first requirement to production. My daily work covers multi-agent systems, RAG and GraphRAG, AI assistants and the automation of ERP and SAP processes with AI. I lead small delivery teams and work directly with clients as their main technical contact. My research background is in machine learning for robotics and in deep graph neural networks. My Master's thesis led to a NeurIPS 2024 paper that I co-authored, and it received the 2025 prize for outstanding scientific achievement from the Freunde der TU Darmstadt. I also wrote an Arabic book that explains AI to readers without a technical background, and I write about AI for the Syrian newspaper Al-Thawra.

SKILLS

Generative and agentic AI. LangChain, multi-agent systems, agent workflows and tool use, AI assistants, prompt and evaluation design, model fine-tuning.

Retrieval and knowledge. RAG, GraphRAG and knowledge graphs, long context handling, document parsing, summarization, transcription and structured data extraction.

Machine learning and deep learning. PyTorch, training and fine-tuning, graph neural networks, computer vision with encoder decoder models, reinforcement learning, classical ML and model evaluation.

Robotics. ROS, Gazebo, Isaac Gym, OMPL, robot perception, obstacle avoidance, grasp detection and motion planning.

Enterprise AI and automation. AI driven automation of ERP processes, SAP and SAP HANA integration, AI agents for statistical analysis, queries and reporting.

Software and MLOps. Python at expert level, FastAPI, Go, Java, JavaScript and Vue.js, cloud native microservices, containers and orchestration, MLOps, CI and full stack web applications.

Leadership. Technical team lead, end to end project ownership, requirements analysis, solution architecture, client communication, mentoring and technical hiring.

Research and writing. Experimental design, benchmarking, scientific publishing, technical writing and science communication.

PROFESSIONAL EXPERIENCE

Senior AI Engineer
Aug 2025 to present

ponturo consulting AG, Frankfurt am Main, Germany

- Lead the delivery of enterprise AI solutions from requirements and architecture to deployment and optimization, both in the cloud and on premise.
- Act as technical lead for small delivery teams. Make the architecture decisions, coordinate the work, mentor junior engineers and working students and run technical interviews for new hires.
- Work as the main technical contact for clients, turn their business needs into solution proposals and keep everyone aligned through the whole project.
- Build multi-agent systems with LangChain and Auto-Agentics, and RAG and GraphRAG solutions that combine knowledge graphs with long context handling.
- Automate enterprise processes with AI, from document parsing, summarization, transcription and data extraction to AI agents for analysis and reporting connected to SAP and SAP HANA.
- Deliver complete products instead of isolated models, with agentic workflows and full stack web applications on cloud native microservices.

AI Engineer
Jan 2025 to Jul 2025

ponturo consulting AG, Frankfurt am Main, Germany

- Developed multi-agent systems with LangChain, Auto-Agentics and modular architectures.
- Designed RAG solutions with knowledge graphs and long context handling.
- Built pipelines for document parsing, summarization, transcription and data extraction, and AI agents connected to SAP and SAP HANA for analysis and reporting.
- Built cloud native AI pipelines and enterprise AI assistants and led agile AI development from design to deployment.

AI Engineering Consultant
Dec 2023 to Dec 2024

ponturo consulting AG, Frankfurt am Main, Germany

- Developed, trained and fine-tuned machine learning and deep learning models for complex business problems.
- Built RAG systems and AI agent pipelines that automate information processing.
- Developed analysis tools for large datasets and integrated AI solutions into client systems with interdisciplinary teams, including testing and validation.

Machine Learning Engineer
Dec 2022 to Nov 2023

ponturo consulting AG, Frankfurt am Main, Germany

- Built and optimized ML and DL prototypes in PyTorch and integrated them into the existing software together with the team.
- Analysed and modelled data, documented the development process and reviewed prototypes.

RESEARCH EXPERIENCE

AI Researcher, Master's thesis research
Apr 2023 to Feb 2024

AI and Machine Learning Lab of Prof. Dr. Kristian Kersting, TU Darmstadt

- Carried out the thesis research on oversmoothing in deep graph neural networks that became the basis of the NeurIPS 2024 paper *Graph Neural Networks Need Cluster-Normalize-Activate Modules*, which I co-authored. The central idea, the method, the experiments and the results came out of this thesis work.
- Proposed learnable rational activation functions with clustered and normalized node embeddings and a new metric for cluster dispersion called MADC. Tested with PyTorch on Cora, CiteSeer, PubMed, DBLP and ogbn-arxiv.
- Presented the work at NeurIPS 2024 in Vancouver.

Research Assistant, Machine Learning and Deep Learning for Robotics
Jan 2020 to Mar 2023

Intelligent Autonomous Systems Lab (IAS), TU Darmstadt

- Developed deep learning models for mobile robots, mainly for visual perception and obstacle avoidance with encoder decoder architectures.
- Built model based reinforcement learning methods for adaptive robot behaviour and trained models for object recognition and scene understanding.
- Developed robot software in ROS and trained and tested it in Gazebo and Isaac Gym, including grasp detection and motion planning with OMPL.
- Prepared and supervised robot learning exercises for students in robotics, optimal control, machine learning and reinforcement learning.

OTHER EXPERIENCE

Web Software Developer, Bachelor internship, *Eisenbahnbetriebsfeld Darmstadt* **Oct 2020 to Mar 2021**

Agile web development with a Go backend on BoltDB and a Vue.js frontend.

Student Assistant and Tutor, *TU Darmstadt* **Oct 2019 to Mar 2021**

Tutor for programming in Java, computational engineering and robotics in Python, computer organization and mathematics for computer science.

EDUCATION

M.Sc. Autonomous Systems (Autonome Systeme)
Oct 2021 to Feb 2024

TU Darmstadt, Department of Computer Science

My thesis *Selective Activations for Addressing Oversmoothing in Deep Graph Neural Networks* was graded 1.0 and supervised by Prof. Dr. Kristian Kersting. It received the 2025 prize for outstanding scientific achievement and became the basis of the NeurIPS 2024 paper. The program, taught in German, covers machine learning, robotics and the perception, planning and control of autonomous systems.

B.Sc. Computer Science
Oct 2018 to Sep 2021

TU Darmstadt, Department of Computer Science

My thesis *An Educational Framework for Robot Learning* was graded 1.0 and supervised by Prof. Dr. Jan Peters at the Intelligent Autonomous Systems Lab. I designed and built a Python robot simulator with exercises for students, using Pymunk, Pyglet and Sphinx. The exercises cover robot kinematics with Denavit-Hartenberg, forward and inverse kinematics, splines, PID control, Markov decision processes with policy and value iteration, ProMPs, REPS and ball catching. The program gave me a solid base in computer science, software engineering, algorithms and mathematics.

Agricultural Engineering, four semesters, not completed, *Damascus University* **2010 to 2012**

PUBLICATIONS

Skryagin, A., Divo, F., **Ali, M. A.**, Dhami, D. S. and Kersting, K. (2024). **Graph Neural Networks Need Cluster-Normalize-Activate Modules.** *Advances in Neural Information Processing Systems 37 (NeurIPS 2024), Main Conference Track, Vancouver.* DOI 10.52202/079017-2535. Proceedings, arXiv, Code

The paper builds on my Master's thesis research and introduces a module that reduces oversmoothing in deep graph neural networks.

AWARDS AND SCHOLARSHIPS

Prize for Outstanding Scientific Achievement, Master's thesis
2025

Vereinigung von Freunden der TU Darmstadt

Awarded for my Master's thesis on oversmoothing in deep graph neural networks. It was one of 15 theses honoured at TU Darmstadt in 2025. Award page

Scholarship holder, Studienstiftung des deutschen Volkes 2018

German Academic Scholarship Foundation

Full scholarship from Germany's largest scholarship foundation. I was nominated by the TU Darmstadt Language Centre and was one of four candidates selected out of thirty.

BOOK, ARTICLES AND SCIENCE COMMUNICATION

Author of the book رحلة في عالم الذكاء الاصطناعي لغير المختصين 2026

A Journey into the World of Artificial Intelligence for Non-Specialists. Published by Dar al-Bashir for Culture and Science, 117 pages, in Arabic. The book explains AI to general readers in simple language and shows how it already shapes daily life. Amazon

Writer on AI for Al-Thawra 2026 to present

Syrian national newspaper

I write opinion and analysis pieces about AI policy and its uses. Recent articles discuss why Syria needs a national AI authority, AI between participation and dependency, fighting administrative bloat and corruption with legislation and AI, and building AI that reflects Syrian society. Author page

On LinkedIn I regularly share educational posts about AI for a wide audience.

VOLUNTEERING AND COMMUNITY

Ambassador, *Studienstiftung des deutschen Volkes* **2021 to 2024**

Secretary, *Future Syria Foundation* **Jan 2025 to Jun 2025**

Organizational and administrative work and co-organizing conferences and workshops.

Lead of the media and volunteer teams, *MEACR 2026, Aleppo* **2026**

Led the media team and the volunteer team at the 15th Annual Meeting of the Middle Eastern Association for Cancer Research, and held the workshop AI and Cancer Research.

Language and cultural mediator, *Arabic and German, local school* **2016 to 2024**

Volunteer, *German Red Cross (DRK)* **Apr 2016 to Oct 2016**

Supported refugees in an emergency shelter (Notunterkunft).

I am also a member of a local Integration Commission and of the UNICEF university group in Darmstadt.

LANGUAGES

Arabic as native language, German at C1 level (TestDaF 19 of 20 points) and English at C1 level.