

Modar M. Alfadly

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SUMMARY

Machine learning researcher and engineer with a decade across academic research (KAUST; CVPR and AAAI oral papers on the analytical and robustness properties of deep networks), industry (Meta Reality Labs, Mozn) and national AI programs (helped redefine SDAIA Academy and three national Data & AI standards/frameworks). PyTorch at library-author level.

TECHNICAL PROFILE

- **Deep learning engineering**, PyTorch at library-author level: InvTorch (memory-efficient invertible functions), network_moments (probabilistic moments of DNNs), official code for two robustness papers; PyTorch community contributions (a differentiable covariance that predated `torch.cov`, a symmetric matrix square root); NumPy, TorchVision, ONNX, CUDA
- **LLM inference and serving**, as co-author of the Academy's expert course on inference performance and cost: latency/throughput profiling, continuous batching, KV cache and PagedAttention, prefix and semantic caching, quantisation, distillation, model routing, GPU autoscaling and TCO, with labs on vLLM, ONNX Runtime and TensorRT
- **Systems and tooling**: Linux, Git, Docker, FastAPI and REST services, SQL, Bash; author of uvn, a centralised virtual-environment manager for uv (2024); C/C++ and CUDA for GPU code, TypeScript for tooling

EXPERIENCE

Saudi Data & AI Authority (SDAIA) Nov 2024 – Present

Director, SDAIA Academy Programs & Capability Building Consultant

- Co-authored the SDAIA Academy catalogue of instructor-ready courses across Foundation, Data Scientist and AI Engineer tracks, from Python and PyTorch to fine-tuning (PEFT/TRL), RAG, agentic systems (LangGraph, MCP), LLMops, MLOps, inference performance and cost optimisation, and AI security and red-teaming
- Helped launch SDAIA's Professional Badges for AI Engineers and Data Scientists (Assistant, Associate, Expert)
- Led the flagship program *AI Productivity: Automation & Agentic AI*, delivered nationally through SDAIA's SAMAI initiative: agents and tool use, prompt engineering, automation and generative coding, responsible use
- Built SDAIA Academy programs from the ground up: learning tracks, hired the core delivery team, trained **200+** professionals across government entities
- Co-developed three national Data & AI standards (academic, occupational, higher-education curriculum), launched at **ICAN 2026** and recognized by the Council of Ministers during the Year of AI; keynotes at national AI events

Artificial Intelligence Association (AIA) 2025 – Present

Board Member · National AI ecosystem initiatives and strategic direction of the association

KAUST, Image and Video Understanding Lab (IVUL) 2018 – Mar 2023

Doctoral Researcher (advisor: Prof. Bernard Ghanem); Teaching Assistant 2018 – 2021

- Research on the analytical characterization of deep networks under input noise, adversarial robustness, and VQA robustness: CVPR 2018 oral, AAAI 2019 oral, further preprints (below); code open-sourced
- Teaching Assistant for PhD-level *Deep Learning for Visual Computing* and *Introduction to Computer Vision*; designed the courses' hands-on deep learning labs; ran the lab's PyTorch tutorial and reading-group talks

Meta (Facebook Reality Labs), *Research Scientist Intern*: active learning for large-scale semantic segmentation 2019

Mozn Systems, *Deep Learning Consultant*: joined at inception and built its first data-driven solutions 2017 – 2018

KAUST, *Research Intern*: GPU-based methods for 3D neuron skeletonization in CUDA Summer 2014

EDUCATION

King Abdullah University of Science and Technology (KAUST) 2018 – 2023

Doctoral studies in Computer Science, KAUST Fellowship (full funding); did not complete

M.S., Computer Science (2018) · Thesis: *Analytic Treatment of Deep Neural Networks Under Additive Gaussian Noise*

King Fahd University of Petroleum and Minerals (KFUPM), B.S., Software Engineering (Honors) 2016

PUBLICATIONS

- Towards a Unified Benchmark for Arabic Pronunciation Assessment: Qur'anic Recitation as Case Study, Interspeech 2025
- Improving VQA Models through Robustness Analysis and ICL with a Chain of Basic Questions, arXiv 2304.03147 [second author] 2023
- Improving Variance Estimates in Generative Models, technical report 2021
- Network Moments: Extensions and Sparse-Smooth Attacks, arXiv 2006.11776 2020
- A Novel Framework for Robustness Analysis of Visual QA Models, AAAI Oral [second author] 2019
- Assessing the Robustness of Visual Question Answering, arXiv 1912.01452 [second author] 2019
- Expected Tight Bounds for Robust Deep Neural Network Training, arXiv 1905.12418 2019
- Analytical Moment Regularizer for Gaussian Robust Networks, arXiv 1904.11005 2019
- Analytic Expressions for Probabilistic Moments of PL-DNN with Gaussian Input, CVPR Oral 2018
- Robustness Analysis of Visual QA Models by Basic Questions, CVPR Workshop [second author] 2018
- VQABQ: Visual Question Answering by Basic Questions, CVPR Workshop [second author] 2017

SERVICE & AWARDS

Reviewer: CVPR, NeurIPS, ICLR, ICCV, AAAI · 1st place, National Programming Contest · KFUPM Hackathon winner