



# MUHAMMAD ABDUL MOEED

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## Education

### Technical University of Munich

March 2026

*Masters in Data Engineering and Analytics*

Grade: 1.7

Relevant courses: Advanced NLP, Deep Generative Models, Advanced Deep Learning for Physics, Causality and ML, Fundamental of Optimization for ML, Machine Learning for graphs and sequential data and Approximate Dynamic Programming and Reinforcement Learning.

### Lahore University of Management Sciences

July 2019

*Bachelors in Computer Science*

Placed on Dean's Honour List for 2015.

Courses: Algorithms, Computer Vision, NLP, Data Structures, Linear Algebra, Statistics and Probability.

### Scientific Publication: SPIGM @ ICML 2024

July 2024

Co-author of "*Stein Variational Newton Neural Network Ensembles*". Integrated Stein Variational Gradient Descent with efficient Hessian computational techniques to provide better posterior estimates for approximate Bayesian neural networks.

## Work Experience & Projects

### Bavarian Motor Works (BMW Group), *Part time - AI for engineering* June 2025 – Dec 2025

Graph neural networks for mesh based simulations for structural mechanics and fluid mechanics applications in automotive manufacturing.

### Technical University of Munich,

- *Teaching experience*: Tutor for the graduate courses "Machine Learning" and "Deep Generative Models". Responsible for grading exams and guiding students on homework tasks.
- *Master Project - Transformer architectures for physics simulations*: Research on how transformer architectures, various inductive biases, positional encodings and training methodologies affect learning neural surrogate models for PDEs. Training foundation models for PDEs.
- *Masters Practical Course - Benchmarking provably safe reinforcement learning algorithms for modular robots*: Training policy gradient algorithms using modified action spaces that are provably safe. Applied to control system problems in quadrotor 2D, 3D and mujoco simulator. Grade: 1.0
- *Masters Seminar - Formal verification of neural networks*: Conducted comprehensive literature research with a focus on robustness certification with methods from mathematical optimization, reachability analysis and efficient algorithms. Grade: 1.0

### AIRBUS, *Part time - Defence and Space*

Sep 2023 – Dec 2023

Geospatial data analytics from large datasets (~ 100TBs). Under NDA.

Applied stochastic optimization to customer-employee matching in call centers, performing statistical analysis, Bayesian inference, and building ML pipelines for 11M+ customer datasets.

**Lahore University of Management sciences,**

- *Bachelor Thesis - Sports Analytics using Image Processing and Computer Vision*: Built a Python pipeline for analyzing 3D pose of cricket players playing different shots from video using computational techniques, image processing, and machine learning methods.
- *Research Assistant - Computer Vision (Autonomous Vehicles)*: Computer vision research for autonomous vehicle perception, implementing control prediction models from camera data.

**Skills & Interests**

**Generative AI & LLM Stack:**

**Core Frameworks:** PyTorch (Expert), TensorFlow, JAX, Hugging Face (Transformers, Tokenizers, Accelerate, Datasets).

**Fine-tuning & Optimization:** PEFT (LoRA/QLoRA), Quantization, FlashAttention, vLLM, Reinforcement learning (PPO).

**HPC & Distributed Computing:**

**Infrastructure:** CUDA Programming.

**MLOps:** Docker, Kubernetes, Weights & Biases (WandB), MLflow, CI/CD pipelines.

**Programming & Data Engineering:**

**Languages:** Python (Advanced), C++ (Intermediate), SQL (Complex Queries/Optimization), Bash/Shell Scripting.

**Libraries:** PyG (Graph Neural Networks), NumPy, pandas, SciPy, scikit-learn, Matplotlib, Seaborn.

**Natural Languages:**

English (TOEFL: 109/120), Urdu (Native), Punjabi (Native), German (Beginner).

**Leadership & Extracurriculars**

- Completed online courses in Probability Theory and Mathematical Statistics from MIT.
- **Sports/Fitness:** Captain of badminton team, certified group fitness instructor.
- Winner of robot fighting competition (Robowars UET-Lahore).