Musab Ahmed Khan

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Education

Sabanci University | **B.Sc. Computer Science and Engineering** | Istanbul, Turkey *Sep 2022 - Jun 2026*
CGPA: 3.88/4.0 (High Honors) | **100%** Merit Scholarship (Sakip Sabanci)
Key Coursework: Data Science, Spatial Data Science, Machine Learning, Deep Learning, Artificial Intelligence, NLP, Network Science, Data Analytics and Optimization, Software Engineering, Mobile Application Development, Data Structures, Database Systems, Linear Algebra, Discrete Math, Probability, Statistics
Volunteering: TOM@University, SUBUH Super Active club member

Bal Bhawan School | **High School** | Bhopal, India *Jun 2021*
Grade: 90%
Key Coursework: Physics, Chemistry, Maths, Computer Science

Work Experience

Eastern Al Maha Company (EMCO), *Part-Time Full-Stack Software Developer* | Kuwait City, Kuwait *Nov 2025 - Jan 2026*
- Lead further refinement of the MACS 3 auditing system and delivered a more feature-rich, powerful and intuitive solution based on field deployment feedback.
- Collaborated in a 2 person team to enhance all 3 parts of the system to ensure long-term maintainability of the company's nationwide auditing infrastructure.

Eastern Al Maha Company (EMCO), *Software Developer Intern* | Kuwait City, Kuwait *Jun 2025 - Aug 2025*
- Developed "MACS 3": a 3 component auditing system combining planogram compliance **computer vision model**, mobile task management **app**, and web-based admin **dashboard** to automate FMCG distribution operations of the company across Kuwait.
- Improved compliance accuracy by **67%** within 10 days, with **80%** of non-compliance flags now originating from the mobile app compared to manual reporting.

Publications and Preprints

Under Review / Submitted
- Musab Ahmed Khan. SU NLP 29 at SemEval-2026 Task 5: DynaOrd - Hybrid Dynamic Ordinal Regression with LoRA-Fine-Tuned DeBERTa-v3. Under review at SemEval 2026 (co-located with ACL 2026).

Projects

ORGAN-AWARE MULTI-STAGE MEDICAL IMAGE SEGMENTATION (U-NET++) *Oct 2025 - Jan 2026*
- Developed medical image segmentation **CV** models for **lung** pneumothorax (SIIM-ACR) and **brain** MRI FLAIR (LGG segmentation), achieving Dice **0.84** and **0.91** respectively. Implemented a lightweight routing classifier to dispatch images to these models automatically with perfect accuracy.
- Implemented **UNet++** architecture with EfficientNet (B1 for lung and B3 for brain) encoders using hybrid BCE+Dice loss and **SCSE attention** modules, with class rebalancing, threshold optimization and test-time augmentation (TTA) for robust inference and maxpool downsampling to preserve small pathological regions.
- Future plans to create an end-to-end pipeline, add more model types and integrate **xAI** methods (attention maps, saliency) to support clinical decision-making.
- Github: https://github.com/orgs/CS415-MultiModal-Med-Image-Segmentation/repositories

SEMEVAL 2026 TASK 5: AMBISTORY WORD SENSE PLAUSIBILITY PREDICTION *Oct 2025 - Feb 2026*
- Built a transformer-based **NLP** model for SemEval 2026 Task 5 to predict human plausibility ratings (1–5) for word senses in ambiguous narrative contexts.
- Used the AmbiStory dataset (2K stories), with future plans including using LLMs to generate augmented datasets in Ambistory's style to reduce overfitting.
- Achieved **0.73** combined score on the SemEval leaderboard using fine-tuned **DeBERTa** and novel hybrid CORAL + MSE hybrid loss with dynamic weighting.

GRADUATION PROJECT: Al RESEARCH GAP FINDER *Feb 2025 - Jan 2026*
- Developed an **AI**-powered end to end human-in-the-loop framework to automate Systematic Mapping Studies (**SMS**) using **LLMs** and Model Context Protocol (**MCP**) framework.

- Made a proof of concept of automating months-long SMS process of research paper retrieval, screening with snowballing, topic extraction and classification, and knowledge graph construction for use in research trend and gap analysis, along with smart conference style SMS report generation.

SPATIAL ANALYSIS OF POLITICAL DISORDER IN KENYA (1997–2024) *Oct 2025 - Jan 2026*

- Analyzed 16,225 **ACLED** political violence and protest events (1997–2024) using spatial geometry and OpenStreetMap data, replicating election-cycle patterns.
- Demonstrated an accessibility gradient in political disorder, with riots concentrated near major roads (median ≈0.35 km) and battles occurring in remote regions, and quantified systematic coastal vs. inland differences in event frequency and severity.
- **Github:** https://github.com/Spatial-Data-Science-494/Kenya-Political-Violence-2022

GITHUB DEVELOPER NETWORK ANALYSIS *Jan 2025 - May 2025*

- Analyzed 1.9M **GitHub** users and 3.9M follower relationships using GPU-accelerated cuGraph and NetworkX for large-scale developer influence analysis.
- Investigated whether programming language diversity correlates with social network centrality using PageRank, betweenness, and community detection metrics.
- **Github:** https://github.com/GraphVader/fictional-octo-waddle

UNDERSTANDING A PERSON'S ETHNICITY USING A PHOTOGRAPH: CV MODEL *Oct 2023 - Jan 2024*

- Built an image classification **CV** model with AI to predict ethnicity from photographs using a dataset of individuals from the GCC, Egypt, and Levant regions.

Skills

Language: English – Professional Proficiency | **Hindi** – Native Proficiency | **Urdu** – Native Proficiency

Technical: C++, Python, R, Java, JavaScript, Prolog, Verilog, SQL, HTML, CSS,MySQL, PostgreSQL, MongoDB, Firebase, CUDA, Numba, Pandas, PyTorch, Numpy, NetworkX, cuGraph, Node.js, Express.js, React.js, React Native, Git, Github, Jest, Kubernetes, Docker, Skaffold, Android Studio, Postman, Scrum, Jira

Soft: Deadline/Time management, Teamwork, Communication, Collaboration, Problem solving, Empathy, Hardworking, Decision making, Creativity, Critical thinking

Certificates

NVIDIA - Fundamentals of Accelerated Computing with CUDA Python *May 2025*

NVIDIA - Applications of AI for Predictive Maintenance *Feb 2025*

NVIDIA - Generative AI with Diffusion Models *Mar 2024*

NVIDIA - Building Transformer-Based Natural Language Processing Applications *Mar 2024*

NVIDIA - Fundamentals of Accelerated Computing with CUDA C/C++ *Mar 2024*

IBM - Data Analysis with Python *Oct 2022*

MITx X Series Program - Computational Thinking using Python *Dec 2021*

HarvardX CS50AI - CS50's Introduction to Artificial Intelligence with Python *Aug 2021*