Muhammad Sohail Danish

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EDUCATION

Mohamed bin Zayed University of Artificial Intelligence   **United Arab Emirates**
PhD in Computer Vision | GPA: 3.57/4.00   *Aug 2023 – Present*
- Recipient of *fully funded scholarship* sponsored by Govt of UAE
- *Selected Courses:* Advanced Computer Vision, Advanced 3D Computer Vision, Advanced Techniques in Visual Object Recognition and Detection, Life-long Learning Agents for Vision, Advance Topics in Vision and Language
- *Research Focus:* Geospatial Foundation Models, Vision-Language Models for Earth Observation
- *Advisor:* **Prof. Salman Khan***, Co-Advisor:* **Prof. Muhammad Haris Khan**

Information Technology University   **Pakistan**
MS in Data Science | GPA: 3.47/4.00   *Sept 2020 – Jun 2023*
- Recipient of *Graduate Student Fellowship* for two years
- *Selected Courses:* Mathematical foundations of Data Science, Machine Learning, Deep Learning, Computer Vision, Big Data Analytics, Information Retrieval and Text Mining
- *MS Thesis:* Single-Domain Generalization for object detection
- *Advisor:* **Prof. Mohsen Ali***, Co-Advisor:* **Prof. Muhammad Haris Khan**

Qurtuba University of Science and Information Technology   **Pakistan**
BS in Computer Science | GPA: 3.97/4.00   *Sept 2015 – Jun 2019*
- *Final Year Project:* Luccy, An Autonomous Drone
- *Selected Courses:* Object Oriented Programming, Data Structure and Algorithm, Artificial Intelligence, Software Engineering, Mobile Apps development

PUBLICATIONS

(* indicates authors contributed equally)

- **Muhammad Sohail Danish**, Muhammad Akhtar Munir, Syed Roshaan Ali Shah, Muhammad Haris Khan, Rao Muhammad Anwer , Jorma Laaksonen, Fahad Shahbaz Khan, and Salman Khan. "TerraFM: A Scalable Foundation Model for Unified Multisensor Earth Observation". **Arxiv 2025**
- **Muhammad Sohail Danish***, Muhammad Akhtar Munir*, Syed Roshaan Ali Shah, Kartik Kuckreja, Fahad Shahbaz Khan, Paolo Fraccaro, Alexandre Lacoste, and Salman Khan. "*GEOBench-VLM: Benchmarking Vision-Language Models for Geospatial Tasks.*" **ICCV 2025 (Highlight)**
- Soni, Sagar, Akshay Dudhane, Hiyam Debary, Mustansar Fiaz, Muhammad Akhtar Munir, **Muhammad Sohail Danish**, Paolo Fraccaro et al. "*Earthdial: Turning multi-sensory earth observations to interactive dialogues.*" In **CVPR 2025**.
- **Muhammad Sohail Danish***, Kuckreja Kartik*, Muzammal Naseer, Abhijit Das, Salman Khan, and Fahad Shahbaz Khan. "*Geochat: Grounded large vision-language model for remote sensing.*" In **CVPR 2024**.
- **Muhammad Sohail Danish**, Muhammad Haris Khan, Muhammad Akhtar Munir, M. Saquib Sarfraz, and Mohsen Ali. "*Improving Single Domain-Generalized Object Detection: A Focus on Diversification and Alignment.*" In **CVPR 2024**
- **Muhammad Sohail Danish**, Javed Iqbal, Mohsen Ali, M. Saquib Sarfraz, Salman Khan, and Muhammad Haris Khan. "*Perturbing Dominant Feature Modes for Single Domain-Generalized Object Detection.*". In **DICTA 2024 (ORAL)**.
- Sultani, Waqas, Wajahat Nawaz*, Syed Javed*, **Muhammad Sohail Danish***, Asma Saadia, and Mohsen Ali. "*Towards low-cost and efficient malaria detection.*". In **CVPR 2022**

EXPERIENCE

PhD Resident Fellow   **Kenya**
Mircrosoft   *Aug 2025 – Present*
- Conducting research on Multi-Agent Multi-Modal LLM systems.
- Developing an intuitive LLM-based interface that enables non-geospatial experts to interact with and query geospatial disaster assessment data.

PhD Researcher   **United Arab Emirates**
MOHAMED BIN ZAYED UNIVERSITY OF ARTIFICIAL INTELLIGENCE   *Aug 2023 – Present*
- Exploring the vision foundation model and large vision language model and their applications in remote sensing

- Proposed GeoChat, the first grounded Large Vision Language Model tailored to Remote Sensing tasks
- Developed GeoBench-VLMs, an extensive benchmark to evaluate remote sensing vision language models
- Developed TerraFM, a multi-sensor foundation model trained on global scale dataset with SOTA results on geospatial benchmarks

Graduate Research Assistant   **United Arab Emirates**
Intelligent Visual Analytics Lab   *Sep 2022 – Aug 2023*
- Developed single-domain generalization in object detection method; introduced alignment losses to improve out-of-domain performance.
- Contributed to the research published in CVPR and DICTA.

Graduate Student Researcher   **Pakistan**
Intelligent Machine Lab   *Sep 2020 – Aug 2022*
- Worked on video face recognition, scene graph generation using vision transformers, domain adaptation in medical imaging.
- Developed a domain adaptation approach to solve the low-cost malaria detection in microscopy images.
- Implemented and reproduced the results of a state-of-the-art CVPR 2019 approach to video-based face recognition.

Teaching Assistant   **Pakistan**
Information Technology University (ITU)   *Sep 2020 – Aug 2022*
- Worked as a teaching assistant for the following courses at ITU:
    - Compiler Construction   Fall 2020
    - Machine Learning   Fall 2021
    - Deep Learning   Spring 2022

Freelance Web and Mobile Apps Developer
Fiverr   *Sep 2016 – Aug 2020*
- Completed 60+ orders with a 5-star rating, achieving Level 2 seller status.
- Built over 20 production-ready web and mobile apps (e-commerce, dynamic calculators, live car auction site).
- Leveraged React, React Native, Django, and PostgreSQL for full-stack solutions.

TECHNICAL SKILLS

Domains: Deep Learning, Computer Vision, Large Language Model, Multi-Modal Learning, Foundation Models, Remote Sensing
Libraries: PyTorch, Tensorflow, Keras, Scikit learn
Programming Languages: Python, JavaScript, PHP
Web/Mobile: React, React Native, Redux, Django, Flask
Databases: MySQL, PostgreSQL, Firebase

References can be provided upon request.