

Muhammad Shurahbeel Bin Sajid

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RESEARCH INTERESTS

My research interests lie in Computer Vision and Artificial Intelligence, particularly Human-Object Interaction Recognition (HOI), multimodal learning, and spatiotemporal visual understanding. My research explores transformer-based architectures and multimodal feature fusion to develop robust and generalizable visual intelligence systems. I aspire to pursue doctoral research that advances fundamental AI methodologies, addresses challenging real-world problems, and contributes to impactful scientific publications and innovations.

EDUCATION

M.S. Data Science

Sep 2023 – Nov 2025

Air University, Islamabad, Pakistan

- Thesis: Unifying Appearance and Motion: Transformer-Based Feature Fusion for HOI Recognition. Supervisor: Prof. Danish Hamid.
- Relevant coursework: Deep Learning, Machine Learning, Computer Vision, Big Data Analytics.
- *Visiting exchange student*, Northwestern Polytechnical University, Xi'an, China (Aug 2024 – Jan 2025), coursework and lab research on full scholarship.

B.A. Education 1.5 years

Mar 2022 – Sep 2023

Virtual University, Islamabad, Pakistan

- Relevant coursework: Curriculum Development, Philosophy of Education, human Development and Learning, Professionalism in Teaching.

B.S. Mathematics

Feb 2016 – May 2020

International Islamic University, Islamabad, Pakistan

- Relevant coursework: Real Analysis, Linear Algebra, Probability and Statistics, Numerical Methods, Calculus, Differential Equations.

RESEARCH EXPERIENCE

Graduate Research Assistant

Nov 2023 – Apr 2025

Air University, Islamabad, Pakistan

- Designed **TransFlow-HOI**, a transformer architecture that fuses RGB appearance and optical-flow motion streams via cross-attention to model long-range temporal dependencies in human-object interaction video.
- Built the full experimental pipeline on the **HOI4D** benchmark: I3D feature extraction, optical-flow computation, two-stage and single-stage training regimes, and evaluation across accuracy, precision, recall, and F1.
- Published this work in IEEE Access as first author.

Visiting Research Student, Bioinformatics R&D Lab

Sep 2024 – Jan 2025

Northwestern Polytechnical University, Xi'an, China

- Modelled Traditional Chinese Medicine prescription records as herb-symptom networks and as hypergraph, capturing multi-herb combinations that pairwise graphs cannot represent.
- Cleaned and normalized heterogeneous herbal datasets for treatment prediction, resolving inconsistent nomenclature and dosage encoding across different records.
- Applied network-based pattern discovery to surface recurring co-prescription motifs and their symptom associations.

PROFESSIONAL EXPERIENCE

Jr. AI Engineer

Jul 2025 – Present

CareCloud (MTBC), Islamabad, Pakistan

- Build and deploy LLM/NLP pipelines that parse and summarize clinical documents, extract structured clinical fields, and feed downstream billing operations for U.S. healthcare revenue cycle management.
- Develop machine learning models for Prior Authorization and Denial Management workflows, covering feature engineering, evaluation design, and integration into production systems.
- Work with clinical and RCM domain experts to define evaluation criteria and validate model outputs against expert judgment.

AI Intern

May 2025 – Jul 2025

CareCloud (MTBC), Islamabad, Pakistan

- Fine-tuned open-source LLMs to build a medical document summarizer, reducing clinical review time by **40%** on internal evaluation sets.
- Contributed to the architecture of AI-driven automation modules subsequently taken to production deployment.

Mathematics Teacher

June 2020 – Aug 2023

Zawiya Academy, Islamabad, Pakistan

- Taught mathematics and computer subject to class 10-12 students.
- Online tutoring and mentoring students from middle east.
- Covered Oxford, Cambridge, and Edexcel coursework.

PUBLICATIONS

TransFlow-HOI: Transformer-Driven Multimodal Fusion for High-Performance HOI Recognition

HONOURS AND AWARDS

- **Outstanding Visiting Student Scholarship**, Northwestern Polytechnical University, 2024; sole recipient nominated from Air University.

TECHNICAL SKILLS

Languages	Python, MATLAB, SQL
Frameworks	PyTorch, TensorFlow, Keras, scikit-learn
Computer Vision	I3D feature extraction, optical flow, YOLO, OpenCV, image segmentation and analysis
Network Analysis	NetworkX, HyperNetX, Cytoscape, Gephi
Data	NumPy, pandas, pyspark, data collection, ETL & ELT, preprocessing, visualization

ACADEMIC SERVICE AND LEADERSHIP

- **Host and Organizer**, International Academic Conference on AI and Machine Learning, Northwestern Polytechnical University, 2025
- **CEP International Talent Program**, School of Software, Northwestern Polytechnical University, collaborative R&D with international and Chinese researchers.
- Organized seminars and formal academic talks at AU and IIUI; represented the university in intraversity debate and public speaking.