# Muhammad Saad

muhammadsaadkhankori.github.io

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LinkedIn: LinkedIn portfolio


## EDUCATION

**Bachelor of Science, Software Engineering** Aug 2017 - Sep 2021

*Islamia College Peshawar(ICP) icp.edu.pk, Pakistan* *CGPA 3.44/4.0*

- Undergraduate research student supervised by Dr. Muhammad Sajjad and Dr. Jamil Ahmad
- Thesis: "Visual explanation of deep learning-based breast cancer classification via gradient localization."
- Major Courses: Object-Oriented Programming (OOP), Data Structure and Algorithms, Software Architecture, Artificial Intelligence

**Higher Secondary School (Pre-engineering)** Sep 2015 - Apr 2017

*Government College Peshawar, gcp.kp.gov.pk, Pakistan* *825/1100*

- Major Courses: Mathematics, Physics, and Chemistry

## RESEARCH INTERSTS

- Advancing medical imaging through robotics by integrating robotic technologies for precise diagnostics, automated imaging procedures, and enhanced minimally invasive interventions
- Integrating robotics with metaverse platforms for telepresence, enabling remote control and interaction in virtual and augmented reality environments.
- Developing deep learning-based frameworks for human activity recognition to enhance robot perception and interaction in indoor environments

## PUBLICATIONS

*****Indicates joint first authors, **+** indicates my role as co-mentor

Action Knowledge Graph for Violence Detection Using Audiovisual Features (Paper) 2024
*M. Khan, **M. Saad***, Abbas Khan, Wail Gueaieb; Abdulmotaleb El Saddik; Giulia De Masi; Fakhri Karray*

Combating Counterfeit Products in Smart Cities with Digital Twin Technology (Paper) 2023
***M. Saad***, M. Khan, M. Saeed, A. E. Saddik and W. Gueaieb*

Gaming-Based Education System for Children on Road Safety in Metaverse Towards Smart Cities (Paper) 2023
*M. Saeed, A. Khan, M. Khan, **M. Saad**+, A. El Saddik and W. Gueaieb*

BreastUS: Vision Transformer for Breast Cancer Classification Using Breast Ultrasound Images (Paper) 2022
***M. Saad***, M. Ullah, H. Afridi, F. A. Cheikh and M. Sajjad*

Co-Authored Submissions (Under Review):

- All Languages Matter: Evaluating LMMs on Culturally Diverse 100 Languages, submitted to *CVPR* 2025
- CP-Diffusion: Conditional Prompt-Based Diffusion Models for Video Generation, submitted to *CVPR* 2025

## EXPERIENCE

**Graduate Research Assistant**

*Metaverse Center, Mohamed Bin Zayed University of Artificial Intelligence, Abu Dhabi, UAE*

*Research topics:* Digital twin, Metaverse, Violence detection, LLMs for Interactive Avatars

- Worked on real-time violence detection on Jetson Nano at the Technology Innovation Institute (TII)
- Interactive avatar animation with Mixamo and real-time lip-syncing using JavaScript and TypeScript
- Created a visual avatar assistant powered by a fine-tuned LLaMA 3 model, customized with haptics and multimedia data to enhance educational experiences and interactive multimedia books
- Build a custom virtual learning platform named ZapAura, built on Mozilla Hubs, featuring full-body avatars, real-time lip-syncing, and an AI teaching assistant powered by ChatGPT for multilingual interactions

**Undergraduate Research Assistant**

*Digital Image Processing (DIP) Lab in collaboration with NTNU Norway and IMLAB South Korea, ICP, Peshawar, Pakistan*

*Research topics:* Facial emotion recognition (FER), Activity recognition, Medical imaging

- Contributed to NTNU's implementation of the Facial Emotion Recognition Module assigned by the ALAMEDA AI Toolkit to analyze facial expressions for pain assessment and emotional state monitoring in neurological healthcare
- Attention-based CNN-LSTM, CNN-GRU, and Video Vision Transformer (ViViT) Models for Complex Activity Recognition in Cricket

- Teaching assistant for Python programming course

## PROJECTS

**COVID-19 Progression Visualization** 2021

- Applied pre-trained CNNs models and proposed lightweight CNN for COVID-19 X-ray classification.
- Used Grad-CAM to visualize disease progression on X-rays over time, enabling model interpretability.
- Gained insights into CNN performance and critical regions in medical imaging.

**Sequential Models for Video Analysis** 2022

- Extracted video features using CNNs, applied LSTM, GRU, and attention-based models for temporal analysis.
- Enhanced temporal analysis with LSTM-Attention and GRU-Attention.
- Explored Vision Transformers for video analysis, assessing their effectiveness compared to traditional CNN-sequential model pipelines.

## TECHNICAL SKILLS

**Programming:** Python, MATLAB, C++, SQL, JavaScript. (HTML/CSS)
**Technologies:** Keras, Tensorflow, Pytorch, Scikit-learn, NodeJS, React, A-Frame, ThreeJs,
**Tools:** PyCharm, VS code, Git, Blender, AWS (Amazon Web Services), Digital Ocean, Docker, Latex

## HONOURS AND AWARDS

- Award of appreciation for securing 1st position in Youth Talent Expo
- Awarded a data science certificate by the government of Pakistan (NAVTTC)
- High achiever award from Islami Jamiat Talaba (IJT) president for organizing the best cricket tournament

## EXTRACURRICULAR ACTIVITIES

- Captain of Islamia College Peshawar cricket team for tennis ball tournaments
- Organized and headed a tennis ball cricket tournaments as president of Islami Jamiat Talaba (IJT) student federation

## HOBBIES

- **Academic:** Reading and writing articles
- **Sports:** Playing and watching cricket

## REFERENCES

- **Prof. Abdulmotaleb El Saddik**
  University Research Chair and Professor in the School of Electrical Engineering and Computer Science at the University of Ottawa, Canada
  Professor, Department of Human Computer Interaction, Mohamed Bin Zayed University of Artificial Intelligence, Abu Dhabi, UAE
  Email: elsaddik@uOttawa.ca
- **Dr. Muhmmad Sajjad**
  Associate Professor, Department of Computer Science at Islamia College Peshawar, Pakistan
  Email: muhammad.sajjad@icp.edu.pk