MUSTAQEEM KHAN

✉ mustaqeemicp@gmail.com, mustaqeem.khan@mbzuai.ac.ae

📱 +971 503971132

📍 MBZUAI, Abu Dhabi, United Arab Emirates

ABOUT ME

My research interests revolve around audio, video, and Speech Signal Processing; my Ph.D. thesis was on human emotion recognition using Deep Learning techniques. I have achieved an expert level of conceptual and implementation skills in Deep Learning for various applications. During my Ph.D. research, I designed different kinds of Machine/Deep Learning models, including 1D-CNNs, 2D-CNNs, 3D-CNNs, Multi-Model, audio/text encoders, sequential and its variants for emotion recognition, age and gender detection, action recognition, violence detection, and forecasting. My academic research has been reviewed and published in several reputed peer-reviewed international journals and A* conferences like IEEE, ISE, Elsevier, Welly, IEEE/CVF, and Springer.

EDUCATION

Doctoral PhD (SC)   *September 2019 - 2022*
🏛 Sejong University, Seoul, South Korea   CGPA: 4.44/4.5 (98%)
Department of Software Convergence
Ph.D. Dissertation Topic: Advanced Study of Emotion Recognition Based on Speech Signals using Deep Learning

Master in Computer Science (MSCS)   *2016-2018*
🏛 Islamia College Peshawar, Peshawar, Pakistan   CGPA: 3.94/4.00 (92.22%)
Department of Computer Science   **2016-18 Batch Gold Medalist**
Dissertation Title: Human Action Recognition using Video Stream
Dissertation Publication: Human action recognition using attention-based LSTM network with dilated CNN features

Bachelors' in Computer Science (BSCS)   *2011-2015*
🏛 Institute of Business and Management Sciences, AUP Peshawar, Pakistan   CGPA: 3.35/4.00 (75.73%)
Department of Computer Science   **2011-15**
Dissertation Title: Web-based Design Project

PROFESSIONAL EXPERIENCE

🎞[*September 2022* - **Present**] **Postdoctoral Fellow at Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI), and Lab Coordinator, Multimedia Communication Recognition (MCR) Laboratory**

Responsibilities:

- Collaborating with the Technical Innovation Institute (TII) on an industrial project to develop an advanced drone detection system.
- Managing a team of ten researchers specializing in diverse domains within Artificial Intelligence, encompassing Computer Vision, Data Sciences, Graphics, and Metaverse.
- Providing partial supervision to Master's and Ph.D. students.
- Overseeing project requirements and achievements for the Professor's research projects.
- Managing student implementations and assisting in processing their research articles.

🎞[*September 2019* - **August 2022**] **Research Assistant at Sejong University, Seoul, South Korea, and IT Lab Coordinator**

Responsibilities

- Supervised a team of five researchers and students specializing in Speech Processing and Energy Informatics domains.
- Provided partial supervision to three Master's students.
- Overseeing project requirements and achievements for the Professor's research projects.
- Conducting research and development for various industrial and research projects.

💼[*March 2018 - August 2019*] **Lecture at Dept. of Computer Science, Islamia College Peshawar**

Teach Courses:

- Introduction To Information technology (Course Code: COMP-101)
- Programming Fundamental (Course Code: COMP-102)
- Multimedia and Databases (Course Code: COMPP-102)
- Object Oriented Programming-1 Lab (Course Code: COMPP-106)
- Artificial Intelligence Lab (Course Code: COMPP-315)
- Internet Programming-1 (Web Technologies) Lab (Course Code: COMPP-321)
- Digital Image Processing Lab (Course Code: COMPP-416)

💼[*February 2016 - 2018*] **Research Assistant at Digital Image Processing Laboratory, Dept. of Computer Science, Islamia College Peshawar**

Responsibilities:

- Overseeing project work and conducting research in Computer Vision and Speech Analysis.
- Engaged in video analytics for complex action recognition.

INTERNATIONAL COLLABORATION

🐾**Actively collaborating with research teams from various countries:**

- Sejong University, Seoul, South Korea.
- SKKU University, Seoul, South Korea.
- Inchon National University, South Korea.
- University of Paris, Paris France.
- King Abdulaziz University, Jaddah, Saudi Arabia.
- Maysour University, Maysour, India.
- Islamia College University, Peshawar, Pakistan.

EDITORIAL EXPERIENCE

👤+**Editorial services at several journals.**

- Editorial board member: Annals of Applied Sciences
- Associate editor: European Journal of Mathematical Analysis
- Review Editor: Frontiers Blockchain
- SI Lead Guest editor: MDPI Energy journal; Energy Analytics and Time-Series Data: Applications of Deep Learning

RESEARCH EXPERIENCE

✂**Topics of Interest**

- Speech Signal Processing (Emotion Recognition and Age and Gender Recognition)
- Multi-Modal Speech Emotion Recognition (Audio, Text, Video, Image, and Gesture)
- Computer Vision and Video Analysis: Action Recognition, Violence Detection.
- Electric Energy Forecasting
- Google Scholar
- Research Gate

- Publons

⚘Projects Participation Participated in several Korean Government and industrial projects.

· Intelligent Object Detection, Dynamic Scene and Activity Recognition for Real-Time UAV Applications. (TII: Technology Innovation Institute, Abu Dhabi, UAE)
· Energy Analytics and Time-Series Data: Applications of Deep Learning. (NRF: National Research Foundation, Seoul, South Korea)
· Command AI Data Establishment (2018R1D1A1B07043302) National Research Foundation of Korea (NRFK)
· Development of ensemble methods-based XAI energy platform for effective energy consumption pattern (2019M3F2A1073179) National Research Foundation of Korea (NRFK)
· Human Actions and Activities Recognition (HEC Startup Project 2018-19, Grant 304318/2019-6)

📎Peer-reviewed Research publications

(2024 Publications)

· P$_1$. Ufaq khan, Umair Nawaz, **Mustaqeem Khan**, Abdulmotaleb El Saddik. Deepskinformer: Skin Lesion Segmentation Using Hierarchical Transformers And Edge Enhancement. IEEE International Conference on Image Processing (ICIP) (2024).
· P$_1$. **Mustaqeem Khan**, Jamil Ahmad, Abdulmotaleb El Saddik, Wail Gueaieb, Giulia De Masi, and Fakhri Karray. Drone-HAT: Hybrid Attention Transformer for Complex Action Recognition in Drone Surveillance Videos. Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (2024).

· P$_1$. **Mustaqeem Khan**, Jamil Ahmad, Abdulmotaleb El Saddik, Wail Gueaieb, Giulia De Masi, and Fakhri Karray. Graph-Based Knowledge Driven Approach for Violence Detection. IEEE Consumer Electronic Magazine, (2024): 122946. [IF: 4.1, Q1].

· P$_1$. Ufaq khan, Umair Nawaz, **Mustaqeem Khan**, Abdulmotaleb El Saddik. FETR: A Weakly Self-Supervised Approach for Fetal Ultrasound Anatomical Detection. IEEE International Symposium on Medical Measurements and Applications (MeMeA) (2024).
· P$_2$. Abbas Khan, **Mustaqeem Khan**, Wail Gueaieb, Abdulmotaleb El Saddik, Giulia De Masi, Fakhri Karray. CamoFocus: Enhancing Camouflage Object Detection With Split-Feature Focal Modulation and Context Refinement. Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (2024).

· P$_3$. **Mustaqeem Khan**, Wail Gueaieb, Abdulmotaleb El Saddik, and Soonil Kwon. MSER: Multimodal speech emotion recognition using cross-attention with deep fusion Expert Systems with Applications v. 245, (2024): 122946. [IF: 8.954, Q1]

· P$_4$. Hussam Azzuni, **Mustaqeem Khan**, Abdulmotaleb Elsaddik, and Wail Gueaieb. Smartphone Video-based Monocular 3D Reconstruction. IEEE Consumer Electronics Magazine v. 245, (2024): 122946. [IF: 4.954, Q1]

· P$_5$. **Mustaqeem Khan**, Abdulmotaleb El Saddik, Mohamed Deriche, and Wail Gueaieb. STT-Net: Simplified Temporal Transformer for Emotion Recognition. IEEE Access v. 245, (2024): 122946. [IF: 3.84, Q1]

· P$_6$. **Mustaqeem Khan**, Abdulmotaleb El Saddik, Wail Gueaieb, Giulia De Masi, and Fakhri Karray. VD-Net: An Edge Vision-Based Surveillance System for Violence Detection. IEEE Access v. 12, (2024): 43796-43808. [IF: 3.84, Q1]

· P$_7$. Toluwani Aremu, Li Zhiyuan, Reem Alameeri, **Mustaqeem Khan**, and Abdulmotaleb El Saddik. SSIVD-Net: A Novel Salient Super Image Classification and Detection Technique for Weaponized Violence. Science and Information Conference (2024).

· P8. **Mustaqeem Khan**, Muhammad Saad, Abbas Khan, Wail Gueaieb, Abdulmotaleb El Saddik, Giulia De Masi, and Fakhri Karray. Action knowledge graph for violence detection using audiovisual features. IEEE International Conference on Consumer Electronics (ICCE-2024).

· P9. Abbas Khan, **Mustaqeem Khan**, Wail Gueaieb, Abdulmotaleb El Saddik, Guilia De Masi, Fakhri Karray. SpotCrack: Leveraging a Lightweight Framework for Crack Segmentation in Infrastructure. IEEE International Conference on Consumer Electronics (ICCE-2024).

· P10. **Mustaqeem Khan**, Jamil Ahmad, Abdulmotaleb El Saddik, and Wail Gueaieb. Skin-Former: Mobile-Friendly Transformer for Skin Lesion Diagnosis. IEEE International Conference on Consumer Electronics (ICCE-2024).

(2023 publications)

· P11. **Mustaqeem Khan**, Abdulmotaleb El Saddik, Fahd Saleh Alotaibi, and Nhat Truong Pham. AAD-Net: Advanced end-to-end signal processing system for human emotion detection & recognition using attention-based deep echo state network. Knowledge-Based System v. 270, (2023): [IF: 7.745, Q1]

· P12. **Mustaqeem Khan**, Muhammad Ishaq, Monorama Swain, and Soonil Kwon. Advanced sequence learning approaches for emotion recognition using speech signals. Intelligent Multimedia Signal Processing for Smart Ecosystems (Springer International Publishing), pages 307-325 v. 167, (2023).

· P13. Alice OTHMANI, Bechir Brahem, Younes Haddou, **Mustaqeem Khan**. Machine Learning-based Approaches for Post-Traumatic Stress Disorder Diagnosis using Video and EEG Sensors: A Review. IEEE Sensors Journal (2023, Q1).

· P14. **Mustaqeem Khan**, Muhammad Saeed, Abdulmotaleb El Saddik, and Wail Gueaieb. Artrivit: Automatic face recognition system using vit-based siamese neural networks with a triplet loss. IEEE 32nd International Symposium on Industrial Electronics (ISIE-2023).

· P15. **Mustaqeem Khan**, Abdulmotaleb El Saddik, and Wail Gueaieb. Metaverse key technologies and blockchains: Impacts considerations. IEEE International Conference on Metaverse Computing, Networking and Applications (MetaCom-2023).

· P16. **Mustaqeem Khan**, and Alice Othmani. PD-Net: Multi-Stream Hybrid Healthcare System for Parkinson's Disease Detection using Multi Learning Trick Approach. IEEE 36th International Symposium on Computer-Based Medical Systems (CBMS-2023).

· P17. **Mustaqeem Khan**, Wail Gueaieb, Abdulmotaleb El Saddik, Giulia De Masi, and Fakhri Karray. An efficient violence detection approach for smart cities surveillance system. IEEE International Smart Cities Conference (ISC2-2023).

· P18. Abbas Khan, **Mustaqeem Khan**, Wail Gueaieb, Abdulmotaleb El Saddik, Guilia De Masi, and Fakhri Karray. Recod: resource-efficient camouflaged object detection for uav-based smart cities applications. IEEE International Smart Cities Conference (ISC2-2023).

· P19. Muhammad Saad, **Mustaqeem Khan**, Muhammad Saeed, Abdulmotaleb El Saddik, and Wail Gueaieb. Combating Counterfeit Products in Smart Cities with Digital Twin Technology. IEEE International Smart Cities Conference (ISC2-2023).

· P20. Muhammad Saeed, Abbas Khan, **Mustaqeem Khan**, Muhammad Saad, Abdulmotaleb El Saddik, and Wail Gueaieb. Gaming-Based Education System for Children on Road Safety in Metaverse Towards Smart Cities. IEEE International Smart Cities Conference (ISC2-2023).

· P21. Ufaq Khan **Mustaqeem Khan**, Abdulmotaleb El Saddik, and Wail Gueaieb. DDNet: Diabetic Retinopathy Detection System Using Skip Connection-based Upgraded Feature Block In Proceedings of IEEE International Symposium on Medical Measurements and Applications (MeMeA-2023)

- P$_{22}$. Monorama Swain, Bubai Maji, **Mustaqeem Khan**, Abdulmotaleb El Saddik, and Wail Gueaieb. Multilevel Feature Representation for Hybrid Transformers-based Emotion Recognition In Proceedings of International Conference on Bio-engineering for Smart Technologies (BioSMART-2023)

- P$_{23}$. Kudaibergen Abutalip, Noman Saeed, **Mustaqeem khan**, and Abdulmotaleb Elsaddik. Improving Stain Invariance of CNNs for Segmentation by Fusing Channel Attention and Domain-Adversarial Training. Medical Imaging with Deep Learning, (MIDL-2023).

- P$_{24}$. Muhammad Ishaq, **Mustaqeem khan**, and Soonil Kwon. TCN: A Modest and Lightweight Emotion Recognition System Using Temporal Convolution Network. Computer Systems Science and Engineering (CSSE), (2023): [IF: 4.745]

- P$_{25}$. Muhammad Ishaq, **Mustaqeem khan**, and Soonil Kwon. Deteriorated image classification model for Malayalam palm leaf manuscripts. Journal of Intelligent Fuzzy Systems, (2023): [IF: 2.745]

(2022 publications)

- P$_{26}$. Habib Khan, Munsif Khan, Ijaz Khan **Mustaqeem Khan**. Automated Wheat Disease Classification Framework using Advance Machine Learning Techniques. Agriculture, (2022) [IF: 3.052, Q1].

- P$_{27}$. Bubai Maji, Monorama Swain, and **Mustaqeem Khan**. Advanced Fusion-Based Speech Emotion Recognition System Using a Dual-Attention Mechanism with Conv-Caps and Bi-GRU Features., Electronics v. 11, (2022), 1328. [IF: 2.397].

- P$_{28}$. **Mustaqeem Khan**, Muhammad Ishaq, and Soonil Kwon. A CNN-Assisted Deep Echo State Network using Multiple Time-Scale Dynamic Learning Reservoirs for Generating Short-Term Solar Energy Forecasting. Sustainable Energy Technologies and Assessments v. 52, (2022): [IF: 5.745]

(2021 publications)

- P$_{29}$. **Mustaqeem Khan**, and Soonil Kwon. MLT-DNet: Speech emotion recognition using 1D dilated CNN based on multi-learning trick approach. Expert Systems with Applications v. 167, no. 1 (2021): 114177. [IF: 6.954, Q1]

- P$_{30}$. **Mustaqeem Khan**, and Soonil Kwon. Att-Net: Enhanced emotion recognition system using lightweight self-attention module. Applied Soft Computing v. 102, no. 1 (2021): 107101. [IF: 6.725, Q1]

- P$_{31}$. **Mustaqeem khan**, and Soonil Kwon. Optimal feature selection based speech emotion recognition using two-stream deep convolutional neural network. International Journal of Intelligent Systems v. 36 issues. 9 (2021): 5116-5135. [IF: 10.324, Q1]

- P$_{32}$. Khan Muhammad, **Mustaqeem Khan**, et al. Human action recognition using attention-based LSTM network with dilated CNN features., Future Generation Computing Systems v. 125, (2021): p. 820-830. [IF: 7.187, Q1]

- P$_{33}$. **Mustaqeem Khan**, and Soonil Kwon. 1D-CNN: Speech Emotion Recognition System Using a Stacked Network with Dilated CNN Features. CMC-Computer Material and Continua: v. 67. issue. 3. 2102.06407 (2021).[IF: 4.89, Q1]

- P$_{34}$. **Mustaqeem Khan**, Muhammad Ishaq, and Soonil Kwon. Short-Term Energy Forecasting Framework Using an Ensemble Deep Learning Approach. IEEE Access v. 9, (2021): 94262-94271. [IF: 3.745, Q1]

- P$_{35}$. Tursunov Anvarjon, **Mustaqeem Khan**, Joon Yeon Choen, and Soonil Kwon. Age and Gender Recognition Using a Convolutional Neural Network with a Specially Designed Multi-Attention Module through Speech Spectrograms., Sensors v. 21, (2021): p. 5892. [IF: 3.576, Q1]

· P$_{36}$. **Mustaqeem Khan**, and Soonil Kwon. Speech Emotion Recognition Based on Deep Networks: A Review In Proceedings of the Korea Information Processing Society Conference v. 1, (2021): 331-334. [2005-0011(pISSN)/2671-7298(eISSN)]

· P$_{37}$. **Mustaqeem Khan**, Muhammad Ishaq, Guiyang Son, and Soonil Kwon. Utterance-Level Speech Emotion Recognition using Parallel Convolutional Neural Network with SelfAttention Module. 7th International Conference on Next Generation Computing-2021 v. 1, (2021).

(2020 publications)

· P$_{38}$. **Mustaqeem Khan**, and Soonil Kwon. A CNN-Assisted Enhanced Audio Signal Processing for Speech Emotion Recognition. Sensors v. 20, (2020): 183. [IF: 3.036, Q1]

· P$_{39}$. **Mustaqeem Khan**, and Soonil Kwon. Clustering-Based Speech Emotion Recognition by Incorporating Learned Features and Deep BiLSTM. IEEE Access v. 8, (2020): 79861-79875. [IF: 4.098, Q1]

· P$_{40}$. **Mustaqeem Khan**, and Soonil Kwon. CLSTM: Deep Feature-Based Speech Emotion Recognition Using the Hierarchical ConvLSTM Network. Mathematics v. 8, no. 12 (2020): 2133. [IF: 2.258, Q1]

· P$_{41}$. Tursunov Anvarjon, **Mustaqeem Khan**, and Soonil Kwon. Deep-Net: A Lightweight CNN-Based Speech Emotion Recognition System Using Deep Frequency Features., Sensors v. 18, (2020): p. 5212. [IF: 3.257, Q1]

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Registered/Application Patent

· P1$_2$. Soonil Kwon, **Mustaqeem Khan**. Apparatus and method for speaker's emotion recognition based on the speech signal., Patent number: 17-250623-000, Application number: 1711118600

· P1$_2$. Soonil Kwon, **Mustaqeem Khan**. Apparatus and method for emotion recognition based on voice signals., Patent number: 20-2660623-00, Application number: DP20200667KR

Patents	journal papers	Conference papers	No. of citations	h-index
002	024	019	1750+ (Google scholar)	15

Table 1: Summarized statistics of the publication record.

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👤+Reviewer at more than 35+ reputed journals (Detailed history at Web of Science).
· International Journals of Intelligent Systems
· Intelligent Automation and Soft Computing
· IEEE Transaction on Effective Computing
· IEEE Transaction On Big Data
· Computer Systems Science and Engineering
· Computers, Material and Continua
· Applied Soft Computing
· Multimedia Tools and Applications
· Knowledge-based Systems
· Computer Systems Science and Engineering
· CMC-Computers, Materials & Continua
· IEEE Sensors Journal
· IEEE Access
· Complexity
· Remote Sensing

· Applied Science
· Sensors
· Electronics
· Energies
· ETC....

🏆ACADEMIC ACHIEVEMENTS

1. [*May 2021*] Best Paper Award **Winner**, **KIPS-2021** (Issued by Korea Information Processing Society).

2. [*August 2020*] Best Paper Award **Winner**, **Mathematics-2020** (Issued by Journal Editorial Board).

3. [*August 2022*] Outstanding Research **Award**, **in PH.D.** (Issued by Sejong University, Seoul, South Korea).

4. [*Session 2016 to 2018*] **Gold Medalist**, MS-Computer Science, Islamia College Peshawar.

5. [*2019*] **Fully Funded Ph.D. Scholarship** at Department of Software Convergence, Sejong University, South Korea.

🛒TECHNICAL SKILLS

1. Programming and development skills
[*Expert*] MATLAB (Image processing and computer vision toolbox)

[*Expert*] Python (OpenCV, Numpy, Scikit-learn, TKinter, Pandas, Matplotlib)

[*Intermediate*] Java (GUI, File handling)

[*Intermediate*] C, C#, C++

2. Deep learning frameworks
[*Expert*] TensorFlow and Keras (Tensors, Data loaders, Neural networks, Transformers)

[*Expert*] PyTorch (Tensors, Data loaders, Neural networks, Transformers)

3. Research writing and visualization
[*Expert*] Microsoft Word

[*Expert*] Overleaf

REFERENCES

Abdulmotaleb Elsaddik [PostDoc. Line Manager]
Full Professor and Director of Metaverse laboratory.
Acting Chair of Computer Vision, MBZUAI, Abu Dubai, United Arab Emirates.
Email: a.elsaddik@mbzuai.ac.ae/elsaddik@uottawa.ca,
Phone: +971 50 742 2103

Soonil Kwon [PhD. Supervisor]
Full Professor and Director of Interaction Technology Laboratory (ITLab).
Department of Software, Sejong University, Seoul, South Korea.
Email: skwon@sejong.edu
Phone: +82-10-3408-3847

Muhammad Sajjad [Master's Supervisor]
Associate Professor and Director of Digital Image Processing Laboratory (DIPLab).

Department of Computer Science, Islamia College Peshawar, Peshawar, Pakistan
Email: muhammad.sajjad@icp.edu.pk
Phone: +92-333-9319-519

Khan Muhammad [Mentor]
Assistant Professor and Director of Visual Analytics for Knowledge Laboratory (VIS2KNOW Lab).
Department of Software, Sejong University, Seoul, South Korea
Email: khan.muhammad@ieee.org
Phone: +82-10-4831-2104