Ghulam Muhammad

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Summary:

Ghulam Muhammad is a full professor in the Department of Computer Engineering, College of Computer and Information Sciences at King Saud University (KSU), Riyadh, Saudi Arabia. Prof. Ghulam received his Ph.D. degree in Electronic and Information Engineering from Toyohashi University and Technology, Japan in 2006, M.S. degree from the same university in 2003. He received his B.S. degree in Computer Science and Engineering from Bangladesh University of Engineering and Technology in 1997. He was a recipient of the Japan Society for Promotion and Science (JSPS) fellowship from the Ministry of Education, Culture, Sports, Science and Technology, Japan. His research interests include AI, signal processing, machine learning, IoTs, medical signal and image analysis, and biometrics. Prof. Ghulam has authored and co-authored more than 300 publications including IEEE / ACM / Springer / Elsevier journals, and flagship conference papers. He owns four U.S. patents. He received the best faculty award of Computer Engineering department at KSU during 2014-2015. He has supervised more than 25 Ph.D. and Master Theses. Prof. Ghulam is involved in many research projects as a principal investigator (approximate amount of 1.5 million US dollars) and a co-principal investigator (approximate amount of 1.8 million US dollars).

Key Performance

- Received the **Research Excellence Award 'Lifetime Achievement'** (in the category of Economies of the Future) – 2024, by the Research Development and Innovation Authority (RDIA) and given by the H.E. Minister of Communications and Information Technology
- Received the **Dr. Sulaiman Fakeeh Award for Research and Innovation**, first place in medical research, collaboration with the RDIA, presented by The H.E. Fahad bin Abdulrahman Al-Jalajel, Minister of Health, and Dr. Mazen Fakeeh, President of Fakeeh Care Group. 2026
- **Highly Cited Researcher 2023** (Clarivate Analytics – Web of Science)
- **Best faculty award**, Computer Engineering Department
- More than 25 Ph.D./MS **Thesis supervision** at KSU
- **Owns four US patents**
- 300+ ISI-indexed journal publications, mostly Q1 and Q2
- **Editor** of Information Fusion journal (top 2%), IEEE Internet of Things Journal (top 6%), IEEE Transactions on Affective Computing (top 7%), Alexandria Engineering J. (top 5%).
- Supervised **projects won first and third prizes** in SAMI-KSU annual project competitions
- Principal investigator (PI) and Co-PI of 15+ **funded research projects** from MoE and KACST.

- Showcased prototypes of "Mobile Robot for Plant Disease Detection", "Hand rehabilitation system using a hand exoskeleton", and "Rafiki: Robot for sign language" in innovation expo.
- **Clarivate Analytics H-index: 66; Google Scholar H-index: 92**

Citation Metrics

- Scopus: http://www.scopus.com/authid/detail.url?authorId=56605566900
- Google Scholar: https://scholar.google.com.sg/citations?user=mmKu4-EAAAAJ&hl=en&safe=on
- WoS ID: https://www.webofscience.com/wos/author/record/H-5884-2011
- ORCID ID: http://orcid.org/0000-0002-9781-3969
- Publon Profile: https://publons.com/researcher/2764744/ghulam-muhammad/

Media Coverage:

- https://www.spa.gov.sa/en/N2260759
- https://www.onearabia.me/local/minister-of-communications-honors-scientists-innovators-leap25-011-98387.html
- https://alriyadhdaily.com/article/877c743ee87e43a3b60f370fa0004af0

Table of Contents:

Education:

Ph.D. *March 2006*
Electronic and Information Engineering, Toyohashi University of Technology, Japan.
Thesis Title: A study on auditory based feature extraction and HMM/SM based classification for robust automatic speech recognition

M.S. *March 2003*
Knowledge-based Information Engineering, Toyohashi University of Technology, Japan.
Thesis Title: Normalization of Acoustic Quality of the Monophones in an Utterance.

B.S. *July 1997*

Computer Science and Engineering, Bangladesh University of Engineering and Technology, Bangladesh.

Academic Experience:

Professor
23 January 2017 – present
Department of Computer Engineering,
College of Computer and Information Sciences (CCIS),
King Saud University (KSU), Riyadh, Saudi Arabia

Associate Professor
September 2011 – 22 January 2017
Department of Computer Engineering,
College of Computer and Information Sciences (CCIS),
King Saud University (KSU), Riyadh, Saudi Arabia

Assistant Professor
August 2007 – August 2011
Department of Computer Engineering,
College of Computer and Information Sciences (CCIS),
King Saud University (KSU), Riyadh, Saudi Arabia

JSPS Post-Doctoral Research Fellow
April 2007 - August 2007 (shortened)
Ministry of Education, Japan & Toyohashi University of Technology, Japan.

Toshiba Research Fellow
April 2006 - March 2007
Toyohashi University of Technology, Japan. Collaboration with Toshiba Corporation, Japan.

Courses Taught:

Undergraduate: Signals and Systems (CEN340; CEN351), Digital signal processing (CEN352); Introduction to digital control (CEN455); Digital speech processing (CEN460), Digital image processing (CEN465).

Graduate and post-graduate (Ph.D.): Digital signal processing (CEN543); Digital image processing (CEN545); Digital Speech processing (CEN547); Speech and video signal processing (CEN643); Advanced digital signal processing (CEN645), Advanced Topics in Computer Engineering (CEN691)

Thesis Supervision:

Ph.D. Supervision (total 14 students)
2024 –

- Multi-Modal and Multi-View Deep Learning-Based Driver's Fatigue and Distraction Detection System for Intelligent Vehicles, *Lina Noaman Alkhatib*

2022 – 2024

- Ischemic stroke image segmentation using few-shot learning, *Fatimah Shinan Alshehri*
- Attention-based deep learning techniques for decoding motor imagery EEG brain signals, *Hamdi Taher Altaheri*
- Advanced Deep Segmentation Architectures for the Analysis of Medical Imagery, *Hamdan Sulaiman Al Jowair*, co-supervising
- Abnormal Event Detection for Video Surveillance Using Transformer Model, *Abdulrahman Alshalawi*, co-supervising

2021 – 2022

- A multi-branch convolutional neural network model for electroencephalogram-based motor imagery classification, *Ghadir Ali Altuwaijri*

2020 – 2022

- Sensor based Human Activity Recognition with Spatio Temporal Deep Learning, *Ohoud Nafea Bakeat Almohammadi*, co-supervising

2019 – 2023

- Human Fall Detection Using Multistream Convolutional Neural Networks with Fusion, *Thamer Alanazi*

2017 – 2020

- Hand gesture recognition for sign language using deep learning techniques, *Muneer Hamid A. Al-Hammadi*
- Deep Learning for Brain's Motor Imagery Activity Classification based on Electroencephalography, *Syed Umar Amin*, co-supervising
- A Novel Tree-Based Deep Convolutional Model, *Abduljawad A. Amory*, co-supervising

2014 – 2017

- Investigation of Frequency Regions for Voice Pathology Detection and Classification, *Ahmed Al-nasheri*
- Automatic Voice Pathology Assessment System for Vocal Fold Disorders, *Zulfiqar Ali*, co-supervising, University Teknologi Petronas, Malaysia.

2009-2013

- A multi-directional feature extraction technique for speaker recognition, *Awais Mahmood*, co-supervising

Master Thesis / Project Supervision (total 15 students)

2020-2021

- (Thesis) Tuberculosis Detection in Chest Radiograph by Using Convolutional Neural Networks Architecture, *Saad Ibrahim Nafisah*

2018-2020

- (Thesis) A vision system for date harvesting robot, *Hamdi Altaheri*

2013-2015

- (Thesis) Image forgery detection based on texture descriptors, *Aisha Al-Bogami*
- (Project) Image forgery detection using MSB and local texture descriptors, *Mai Sulaiman Hamad Altulyan*
- (Thesis) Detection and/or Classification of Voice Pathology Using Feature Selection, *Malak Mohammad AlMojaly*
- (Thesis) Automatic voice pathology detection based on vocal tract area measurement, *Ghadir Ali AlTuwaijri*
- (Thesis) Automatic Pronunciation Error Detection of Non-native Arabic Speech, *Afnan Waheed AlHindi*

2012-2013

- (Thesis) Copy Move Image Forgery Detection Based on Multi-resolution Techniques, *Muneer Hamid Ahmed Al-Hammadi*
- (Project) Category Specific Face Recognition Using Bandlets, *Faten Abdullah Alomar*
- (Thesis) Voice Pathology Detection Based on MPEG-7 Features, *Moutasem Melhim*
- (Thesis) Automatic Detection of Copy-Move Image Forgery Based on Clustering Technique, *Motasem S. Al-Sawadi*
- (Project) Face Recognition Using Ridgelet Coefficients, *Mutib Hamdan AL-Enazi*

2011-2012

- (Project) Applying Feature Selection on Local Binary Patterns/WLD for Ethnicity classification for Category-specific Face Recognition, *Fatimah Alanizi*

2009-2010

- (Thesis) Feature selection based verification system using palm and fingerprint, *Muhanad M. Jazzar*
- (Project) Extract context from environment sound, *Mobarak Obaid Alqahtani*

Academic Committee Involvement:

- Department ABET and NCAAA committee member (2010 – present)
- Department course curriculum committee member (2011 – 2012)
- College NCAAA committee member (2012 – 2013)
- Executive committee member, Research Center, CCIS, KSU (2017 – 2024)
- Editorial board member, KSU-CIS Journal (2017 – 2024), Q1

Research Interest:

- Artificial Intelligence
- Machine Learning
- Digital Speech Processing
- Digital Image Processing
- Biometrics
- Smart Healthcare and IoTs
- Multimedia Forensics.

Patent (Four US Patents and one Saudi IP licensing)

1. "Environment recognition of audio input", US Patent No.: 8,812,310 B2, Issue date: August 19, 2014; Inventors: **Ghulam Muhammad** and Khaled S. Alghathbar.
(https://patentimages.storage.googleapis.com/35/1b/fb/91996575d09385/US8812310.pdf)

2. "Tree harvesting tool", US Patent No.: 10,485,171 B1, Issue Date: November 26, 2019: Inventors: Mohamed Amin Mekhtiche, et al.
(https://patentimages.storage.googleapis.com/fa/24/b4/7185e1c2d7cc63/US10485171.pdf)

3. "Robotic systems for harvesting and maintain date palms," US Patent No.: 11,910,751 B1, Issue Date: February 27, 2024; Inventors: Mohamed Amin Mekhtiche, et al.
(https://patents.google.com/patent/US11910751B1/en)

4. "System and Method for Detecting Diseases Among Plants," US Patent No.: US 12,277,762 B1; Filed: December 19, 2024; Issue date: April 15, 2025; Inventors: **Ghulam Muhammad**, et al.
(https://patents.justia.com/patent/12277762)

5. Saudi IP Licensing

"Design and Implementation of Plant Disease Detection System [NAPAT | نبَت]," Saudi IP Code Licensing No. 25-12-27495667; Issue Date: March 17, 2025; Inventors: Ghulam Muhammad, et al.

Databases

Speech Database

Mansour Alsulaiman, **Ghulam Muhammad**, Bencherif Mohamed Abdelkader, Awais Mahmood, Zulfiqar Ali, King Saud University Arabic Speech Database LDC2014S02. Web Download. Philadelphia: Linguistic Data Consortium, 2014. ISBN 1-58563-669-X; https://catalog.ldc.upenn.edu/LDC2014S02

Date Fruits Dataset

H. Altaheri, M. Alsulaiman, M. Faisal, and **G. Muhammad**, "Date Fruit Dataset for Automated Harvesting and Visual Yield Estimation," IEEE DataPort, v1, 2019. DOI: 10.21227/x46j-sk98.

EEG-Motor Imagery Dataset

H. Altaheri, **G. Muhammed**, S. U. Amin, M. Alsulaiman, "REH-MI: EEG Motor Imagery Dataset from the Same Limb for Rehabilitation Applications", IEEE DataPort, May 13, 2025, doi:10.21227/xgzb-6s98

Book Chapter

1. Syed Umar Amin, Mansour Alsulaiman, **Ghulam Muhammad**, M Shamim Hossain, and Mohsen Guizani, "Deep Learning for EEG Motor Imagery-Based Cognitive Healthcare," Book: Connected Health in Smart Cities, pp. 233-254, Eds. A. El Saddik, M. S. Hossain, B. Kantarci, 2020, Springer.

2. Md. Milon Islam, S. M. Taslim Uddin, Sheikh Nooruddin, Fakhri Karray, and **Ghulam Muhammad**, "Internet of Health Things: an introduction," Book: Blockchain and Digital Twin for Smart Healthcare, Chapter 2, pp. 19 - 44, Eds. Tuan Anh Nguyen, 1st Edition - February 1, 2025, Elsevier. ISBN: 9780443303005. DOI: B978-0-443-30300-5.00004-X

Guest Editorial

Ghulam Muhammad, Farook Sattar, and Zulfiqar Ali, "Insights of Machine Learning into Medical Decision Making Systems: From Research to Practice," IEEE Journal of Biomedical and Health Informatics, 2024. DOI: 10.1109/JBHI.2024.3372661

Publications:
Journal Publications (my name is in bold; underline means I am the corresponding author)

2026

331. Zhiguo Qu, Zihong Cai, Le Sun, and **Ghulam Muhammad**, "PCNA-IDS: An integrated lightweight intrusion detection system in internet of vehicles with federated contrastive learning and differential privacy," Knowledge-Based Systems, vol. 336, 115346, pp. 1-13, March 2026. DOI: 10.1016/j.knosys.2026.115346 [*Q1*]

330. Mohammad Azad, Nur Mohammad Fahad, Mohaimenul Azam Khan Raiaan, Tanvir Rahman Anik, Md Faraz Kabir Khan, Habib Mahamadou Kélé Toyé, and **Ghulam Muhammad**, "A Systematic Review of Diffusion Models for Medical Image-Based Diagnosis: Methods, Taxonomies, Clinical Integration, Explainability, and Future Directions," Diagnostics, 2026. DOI: [*Q1*]

329. Farhana Yasmin, Yu Xue, Mahade Hasan, and **Ghulam Muhammad**, "EPSO-Net: A Multi-Objective Evolutionary Neural Architecture Search with PSO-Guided Mutation Fusion for Explainable Brain Tumor Segmentation," Information Fusion, 104119, 2026. DOI: 10.1016/j.inffus.2025.104119 [*Top 2%*]

328. Sunil Prajapat, Dheeraj Kumar, Pankaj Kumar, **Ghulam Muhammad**, and Ashok Kumar Das, "A Blockchain-Enabled Image Encryption Protocol Based on Quantum Walk for Securing Industrial Internet of Things Environments," IEEE Internet of Things Journal, 2026. DOI: 10.1109/JIOT.2026.3650859 [*Top 6%*]

327. **Ghulam Muhammad**, Sumayah Almuntasheri, Fadia Alenezi, Nooran Alhadi, and Victor C. M. Leung, "EEG-based Multimodal Emotion Recognition: Recent Progress, Challenges, and Future Directions," ACM Transactions on Multimedia Computing, Communications, and Applications (ACM TOMM), 2026. DOI: 10.1145/3774428 [*Top 10%*]

326. Xuewei Chao, Jiachen Jiang, Wenyan Ma, Yang Li, Jing Nie, Sezai Ercisli, and **Ghulam Muhammad**, "Personalized Federated Transformer Architecture with Digital Twin for Enhanced Environmental Perception in Intelligent IoV Systems," IEEE Internet of Things Journal, 2026. DOI: 10.1109/JIOT.2025.3641637 [*Top 6%*]

325. Abdullah Lakhan, Tor-Morten Grønli, Ahmet Soylu, **Ghulam Muhammad**, Qurat-ul-ain Mastoi, and Huaming Wu, "Transfer Learning-Enabled System for Drone Medicine Delivery Based on Spatio-Temporal Remote Sensing Data in Edge Cloud Networks," IEEE Transactions on Cloud Computing, 2026. DOI: 10.1109/TCC.2025.3639073 [*Q1*]

324. Zhiguo Qu, Mengqing Zhou, Le Sun, Yimin Yu, and **Ghulam Muhammad**, "QHSA-ViT: A Quantum Discrete Fourier Transform-Based Hierarchical Self-Attention Fusion Vision Transformer for Traffic Sign Recognition in Intelligent Vehicular Networks," IEEE Internet of Things Journal, 2026. DOI: 10.1109/JIOT.2025.3621725 [*Top 6%*]

323. Abdulrahman Alshalawi, Wadood Abdul, and **Ghulam Muhammad**, "Fire Swin:Video Anomaly Detection Using a hybrid model with convolutional layers, fire module, and Swin transformer," Journal of Engineering Research, 2025. DOI: 10.1016/j.jer.2025.08.016 [*ISI indexed*] [*Q2*]

322. Shahariar Hossain Mahir, Md Tanjum An Tashrif, Aysha Siddika Shathe, Md Ahsan Karim, Anichur Rahman, Dipanjali Kundu, Tanoy Debnath, and **Ghulam Muhammad**, "PriFL-XAI: Hybrid Privacy-Preserving Federated Learning Models for Monkeypox Detection through GAN Augmentation and Explainable AI," Biomedical Signal Processing and Control, Volume 112, Part A, 108426, February 2026. DOI: 10.1016/j.bspc.2025.108426 [*Q1*]

2025

321. Le Sun, Yulin Wang, Zhiguo Qu, Jinliang Liu, Jing Tian, Yimin Yu, **Ghulam Muhammad**, and Mahmoud Ragab, "Holo-FAFL: Cross-Modal Feature Augmentation and Latency-Aware Asynchronous Federated Learning for Holographic IoT Systems," IEEE Transactions on Consumer Electronics, vol. 71, no. 4, pp. 11475 – 11486, November 2025. DOI: 10.1109/TCE.2025.3612586 [*Top 4%*]

320. Farhana Yasmin, Yu Xue, Mahade Hasan, Moncef Gabbouj, Mohammad Kamrul Hasan, Khursheed Aurangzeb, and **Ghulam Muhammad**, "Evo-GrayNet: Colon Polyp Detection and Segmentation using Evolutionary Network Architecture Search," IEEE Transactions on Instrumentation & Measurement, vol. 74, pp. 1-14, 2025, Art no. 4021314, December 2025. DOI: 10.1109/TIM.2025.3636637 [*Q1*]

319. Divya Sharma, Chander Prabha, Deepali Gupta, Sapna Juneja, Ali Nauman, and **Ghulam Muhammad**, "Enhancing security and privacy of chest X-ray images by implementing edge-based steganography and layered cryptography," Alexandria Engineering Journal, vol. 132, pp. 456-481, November 2025. DOI: 10.1016/j.aej.2025.08.051 [*Top 5%*]

318. Sanjay Kumar Sahoo, Avinash Samantra, Chinmaya Kumar Mohapatra, Bishnu Prasad Swain, Zulfiqar Ali, and **Ghulam Muhammad**, "LABDT (Lexi AdaBoost Decision Tree): An Approach for Legal Outcome Prediction Fusing Lexical, Semantic, and Similarity-based features," International Journal of Computational Intelligence Systems, vol. 18, article number 279, November 2025. DOI: 10.1007/s44196-025-01003-2 [*Q2*]

317. Nasrullah Khan, **Ghulam Muhammad**, and Xiao-Yuan Jing, "Smart Internet of Everything Model for Knowledge Graph-based Reliable Recommendation," IEEE Internet of Things Journal, vol. 12, no. 20, pp. 43855-43868, October 2025. DOI: 10.1109/JIOT.2025.3599082 [*Top 6%*]

316. Jingchun Zhou, Wenyu Fan, Bing Long, Dehuan Zhang, Zongxin He, Qiuping Jiang, and **Ghulam Muhammad**, "SGUVE-Net: Semantic-Guided Underwater Video Enhancement Network for Real-Time IoT-Based Marine Monitoring," IEEE Internet of Things Journal, Vol. 12, No. 18, pp. 36966 – 36978, September 2025. DOI: 10.1109/JIOT.2025.3581038 [*Top 6%*]

315. Zhiguo Qu, Yalin Li, Le Sun, Yimin Yu, and **Ghulam Muhammad**, "SCS-QBCT: A Supply Chain System-Driven Efficient Quantum Blockchain Cross-Chain Transaction Scheme," IEEE Internet of Things Journal, Vol. 12, No. 19, 2025. DOI: 10.1109/JIOT.2025.3581038 [*Top 6%*]

314. Abdulrahman Alshalawi, Wadood Abdul, and **Ghulam Muhammad**, "Advanced Detection of Violence from Video: Performance Evaluation of Transformer and state of the art of convolution of neural network transformer," IEEE Access, vol. 13, pp. 74200-74216, May 2025. DOI: 10.1109/ACCESS.2025.3564435 [*Q2*]

313. Anichur Rahman, Dipanjali Kundu, Tanoy Debnath, Muaz Rahman, Utpol Kanti Das, Abu Saleh Musa Miah, and **Ghulam Muhammad**, "From AI to the Era of Explainable AI in Healthcare 5.0: Current State and Future Outlook," Expert Systems, vol. 42, Issue 6, e70060, pp. 1-36, June 2025. DOI: 10.1111/exsy.70060 [*Q2*]

312. Isha Kansal, Vikas Khuallar, Gifty Gupta, Deepali Gupta, Sapna Juneja, Ali Nauman, and **Ghulam Muhammad**, "Deep Learning-Based Privacy Preserving Multimodal Biometrics Recognition for Cross-Silo Datasets," Expert Systems, vol. 42, Issue 6, e70053, pp. 1-25, June 2025. DOI: 10.1111/exsy.70053 [*Q2*]

311. Sunil Prajapat, Pankaj Kumar, Ashok Kumar Das, and **Ghulam Muhammad**, "Generative AI-Enabled Quantum Encryption Algorithm for Securing IoT-Based Healthcare Application Using Blockchain," IEEE Internet of Things Journal, vol. 12, no. 13, pp. 24541-24551, July 2025. DOI: 10.1109/JIOT.2025.3555159 [*Top 6%*]

310. Zhiguo Qu, Yichen Xia, Le Sun, Wenjie Liu, and **Ghulam Muhammad**, "QCACNN: A Quantum Convolutional Neural Network Algorithm for Traffic Sign Recognition in Carbon-Intelligent Electric Vehicles," IEEE Internet of Things Journal, vol. 12, no. 16, 2025. DOI: 10.1109/JIOT.2025.3553897 [*Top 6%*]

309. Md. Milon Islam, Fakhri Karray, and **Ghulam Muhammad**, "MSF-Net: Multi-stage fusion network for emotion recognition from multimodal signals in scalable healthcare," Information Fusion, vol. 119, 103028, July 2025. DOI: 10.1016/j.inffus.2025.103028 [*Top 2%*]

308. Kranthi Kumar Singamaneni, Anil Kumar Budati, Shayla Islam, Raenu Kolandaisamy, and **Ghulam Muhammad**, "A Novel Hybrid Quantum-Crypto Standard to Enhance Security and Resilience in 6G enabled IoT Networks," IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 18, pp. 7876-7891, March 2025. DOI: 10.1109/JSTARS.2025.3540905 [*Q1*]

307. Chintha Sri Pothu Raju, Rabul Hussain Laskar, Zulfiqar Ali, and **Ghulam Muhammad**, "Attention-based Fusion for Stroke Lesion Segmentation on Computed Tomography Perfusion Data," ACM Transactions on Multimedia Computing, Communications, and Applications (ACM TOMM), vol. 21, no. 4, Article No.: 121, pp. 1 - 23, April 2025. DOI: 10.1145/3716632 [*Top 10%*]

306. Jingchun Zhou, Jingchun Zhou, Chunjiang Liu, Bing Long, Dehuan Zhang, Qiuping Jiang, and **Ghulam Muhammad**, "Degradation-Decoupling Vision Enhancement for Intelligent Underwater Robot Vision Perception System," IEEE Internet of Things Journal, vol. 12, no. 12, pp. 17880-17895, June 2025. DOI: 10.1109/JIOT.2025.3540033 [*Top 6%*]

305. Zhiguo Qu, Xuemeng Zhao, Le Sun, and **Ghulam Muhammad**, "DAQFL: Dynamic Aggregation Quantum Federated Learning Algorithm for Intelligent Diagnosis in Internet of Medical Things," IEEE Internet of Things Journal, vol. 12, no. 18, 2025. DOI: 10.1109/JIOT.2025.3537614 [*Top 6%*]

304. Zhiguo Qu, Xiyu Fu, Le Sun, and **Ghulam Muhammad**, "QDICP: A quantum blockchain model for copyright protection of digital images in consumer electronics," IEEE Transactions on Consumer Electronics, vol. 71, no. 2, pp. 5189-5200, May 2025. DOI: 10.1109/TCE.2024.3522276 [*Top 4%*]

303. Pooja Kherwa, Jyoti Arora, Tripti Sharma, Deepali Gupta, Sapna Juneja, **Ghulam Muhammad**, and Ali Nauman, "Contextual Embedded Text Summarizer System: A Hybrid Approach," Expert Systems, vol. 42, no. 2, e13733, pp. 1-18, February 2025. DOI: 10.1111/exsy.13733 [*Q2*]

302. Mingzhe Zhai, Qianhong Wu, Yizhong Liu, Bo Qin, Yang Yang, **Ghulam Muhammad**, and Prayag Tiwari, "Privacy Preservation in AI-Driven IoT for Vehicles via Hierarchical Sharding Blockchain," IEEE Internet of Things Journal, vol. 12, no. 8, 2025. DOI: 10.1109/JIOT.2024.3513770 [*Top 6%*]

301. Md. Sakhawat Hossain Rabbi, Md. Masbahul Bari, Tanoy Debnath, Anichur Rahman, Avik Kumar Das, Md. Parvez Hossain, and **Ghulam Muhammad**, "Performance Evaluation of Optimal Ensemble Learning Approaches with PCA and LDA-based Feature Extraction for Heart Disease Prediction," Biomedical Signal Processing and Control, Vol. 101, 1071382025, pp. 1-21, March 2025. DOI: 10.1016/j.bspc.2024.107138 [*Q1*]

300. Le Sun, Wenzhang Dai, and **Ghulam Muhammad**, "Gating Memory Network Multi-Layer Perceptron for Traffic Forecasting in Internet-of-Vehicles systems," IEEE Internet of Things Journal, vol. 12, no. 5, pp. 4783-4793, March 2025. DOI: 10.1109/JIOT.2024.3486722 [*Top 6%*]

299. Le Sun, Shunqi Liu, and **Ghulam Muhammad**, "FedWFC: Federated Learning with Weighted Fuzzy Clustering for Handling Heterogeneous Data in MIoT Networks," Alexandria Engineering Journal, vol. 111, pp. 194-202, January 2025. DOI: 10.1016/j.aej.2024.10.033 [*Top 5%*]

298. Chintha Sri Pothu Raju, Bala Chakravarthy, Neelapu, Rabul Hussain Laskar, and **Ghulam Muhammad**, "Analysis of multimodal fusion strategies in deep learning for ischemic stroke lesion segmentation on computed tomography perfusion data," Multimedia Tools and Applications, Volume 84, pp. 7493–7518, April 2025. DOI: 10.1007/s11042-024-19252-2

297. Le Sun, Zhimeng Zhang, and **Ghulam Muhammad**, "Generative learning-based personalized federated learning for metaverse data security," IEEE Systems, Man, & Cybernetics Magazine, vol. 11, no. 2, pp. 4-13, April 2024. DOI: 10.1109/MSMC.2024.3449572 [*Q3*]

2024

(From this year backwards, I did not put the ranking of the journals because of the yearly changing of the ranking)

296. Ohoud Nafea, Wadood Abdul, and **Ghulam Muhammad**, "Incorporating Attention Mechanism into CNN-BiGRU Classifier for HAR," IEEE Access, vol. 12, pp. 160205-160218, November 2024. DOI: 10.1109/ACCESS.2024.3487860 [*ISI indexed*]

295. Sonia Goel, Meena Tushir, Jyoti Arora, Tripti Sharma, Deepali Gupta, Ali Nauman, and **Ghulam Muhammad**, "An Enhanced Integrated Method for Healthcare Data Classification with Incompleteness," CMC-Computers, Materials & Continua, vol. 81, no. 2, pp. 1-21, November 2024. DOI: 10.32604/cmc.2024.054476 [*ISI indexed*]

294. Fatima Alshehri and **Ghulam Muhammad**, "Ischemic Stroke Segmentation by Transformer and Convolutional Neural Network Using Few-Shot Learning," ACM Transactions on

Multimedia Computing, Communications, and Applications, vol. 20, no. 12, 394, pp. 1-21, November 2024. DOI: 10.1145/3699513 [*ISI indexed*]

293. Le Sun, Yueyuan Wang, Huiyun Li, and **Ghulam Muhammad**, "Fine-Grained Vulnerability Detection for Medical Sensor Systems," Internet of Things, vol. 28, 101362, pp. 1-16, December 2024. DOI: 10.1016/j.iot.2024.101362 [*ISI indexed*]

292. Le Sun, Yuhang Li, and **Ghulam Muhammad**, "Soft Computing-driven Infrared and Visible Image Fusion Network for Security Application Service," Applied Soft Computing, vol. 165, 112114, pp. 1-13, November 2024. DOI: 10.1016/j.asoc.2024.112114 [*ISI indexed*]

291. Pummy Dhiman, Amandeep Kaur, Deepali Gupta, Sapna Juneja, Ali Nauman, and **Ghulam Muhammad**, "GBERT: A Hybrid Deep Learning Model Based on GPT-BERT for Fake News Detection," Heliyon, vol. 10, no. 10, e35865, August 2024. DOI: 10.1016/j.heliyon.2024.e35865 [*ISI indexed*]

290. Le Sun, Zhimeng Zhang, and **Ghulam Muhammad**, "FedCPD: A federated learning algorithm for processing and securing distributed heterogeneous data in the metaverse," IEEE Open Journal of the Communications Society, vol. 5, pp. 5540- 5551, September 2024. DOI: 10.1109/OJCOMS.2024.3435389 [*ISI indexed*]

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56. **Ghulam Muhammad**, Muhammad Hussain, Anwar M. Mirza, and George Bebis, "Dyadic wavelets and DCT based blind copy-move image forgery detection," IET Image Processing Conference, London, July 2012.

55. Muhammad Hussain, Salabat Khan, **Ghulam Muhammad**, and George Bebis, "Mass detection in digital mammograms using Gabor filter bank," IET Image Processing Conference, London, July 2012.

54. Muhammad Hussain, Salabat Khan, **Ghulam Muhammad**, and George Bebis, "Mass detection in digital mammograms using optimized Gabor filter bank," International Symposium on Visual Computing (ISVC'12), Springer LNCS 7432, pp. 82-91, Crete, Greece, July 2012.

53. Ihsan Ullah, Muhammad Hussain, Hatim Aboalsamh, **Ghulam Muhammad**, Anwar M. Mirza, and George Bebis, "Gender recognition from face images with dyadic wavelet transform and local binary pattern," International Symposium on Visual Computing (ISVC'12), Springer LNCS 7432, pp. 409-419, Crete, Greece, July 2012.

52. **Ghulam Muhammad**, Muhammad Hussain, Fatmah Alenezy, Anwar M. Mirza, George Bebis, Hatim Aboalsamh, "Race recognition using local descriptors," IEEE International Conference on Acoustics, Speech and Signal processing (ICASSP'12), Kyoto, Japan, March 2012.

51. **Ghulam Muhammad**, Muhammad Hussain, Fatimah Alenezy, George Bebis, Anwar M. Mirza, and Hatim Aboalsamh, "'Race Recognition From Face Images Using Weber Local Descriptor," 19th International Conference on Systems, Signals and Image Processing (IWSSIP), Vienna, Austria, April 2012.

50. Ihsanullah, Muhammad Hussain, **Ghulam Muhammad**, George Bebis, and Hatim Aboalsamh, "'Gender Recognition from Face Images with Local WLD Descriptor," 19th International Conference on Systems, Signals and Image Processing (IWSSIP), Vienna, Austria, April 2012.

49. Mansour Alsulaiman, Zulfiqar Ali, and **Ghulam Muhammad**, "Voice Intensity based Gender Classification by Using Simpson's Rule with SVM," 19th International Conference on Systems, Signals and Image Processing (IWSSIP), Vienna, Austria, April 2012.

48. Awais Mahmood, Mansour Alsulaiman, **Ghulam Muhammad**, "Multidirectional Local Feature for Speaker Recognition," Third International Conference on Intelligent Systems Modelling and Simulation (ISMS), pp.308-311, Malaysia, February 2012.

47. Hesham Altwaijry, Mejahed C. Mekhallalati, Hamid R. Abachi and **Ghulam Muhammad**, "Quality Improvement Using a Rubrics Based Methodology in ABET," TechEducation Conference, Springer LNCS, Barcelona, July 2012.

46. Mansour Alsulaiman, Mohamed Bencherif, Ghassan Al Shatter, Saad Al-Kahtani, **Ghulam Muhammad**, Zulfiqar Butt and Mohamed Al-Gabri, "Automatic identification of Arabic L2 Learners Origin," International Symposium on Automatic Detection of Errors in Pronunciation Training (IS ADEPT), pp. 107-112, Sweden, June 2012.

2011

45. Mansour Alsulaiman, **Ghulam Muhammad**, et al., "Building a Rich Arabic Speech Database" Fifth Asia modeling Symposium, pp. 100-105, Malaysia, June 2011.

44. Mansour Alsulaiman, Zulfiqar Ali, and **Ghulam Muhammad**, "Gender Classification with Voice Intensity," European Modeling Symposium (EMS), 2011.

43. Mansour Alsulaiman, **Ghulam Muhammad**, Zulfiqar Ali, "Comparison of Voice Features for Arabic Speech Recognition", Proc. International Conference on Digital Information Management'11, pp. 90-95, Melbourne, September 2011.

42. Najah Muhammad, Muhammad Hussain, **Ghulam Muhammad**, and George Bebis, "A Non-Intrusive Method for Copy-Move Forgery Detection", ISVC 2011, Part II, LNCS 6939, Springer-Verlag Berlin Heidelberg, pp. 516–525, 2011.

41. **Ghulam Muhammad** and Mohammad S. Hossain, "Robust Copy-Move Image Forgery Detection using Undecimated Wavelets and Zernike Moments," ACM Third International Conference on Internet Multimedia Computing and Service (ICIMCS), doi: 10.1145/2043674.2043702, 2011.

40. **Ghulam Muhammad**, Mansour Alsulaiman, Awais Mahmood, and Zulfiqar Ali, "Automatic voice disorder classification using vowel formants," IEEE International Conference on Multimedia and Expo (ICME) – Workshop MUST-EH 2011, Barcelona, July 2011.

39. **Ghulam Muhammad**, Muhammad Hussain, Khalid Khawaji, and George Bebis, "Blind copy move image forgery detection using dyadic wavelet transform," The 17th DSP Conference, Greece, July 2011.

38. Mansour Alsulaiman, **Ghulam Muhammad**, Mohammed A. Alomari, Mohammed A. Alshehri, Zulfiqar Ali, and Awais Mahmood, "An Automatic Diagnostic System for Medically Disordered Voice," The 2011 International Conference on Image Processing, Computer Vision, & Pattern Recognition (IPCV'11), USA, July 18-21, 2011.

37. **Ghulam Muhammad**, Khalid AlMalki, Tamer Mesallam, Mohamed Farahat, and Mansour Alsulaiman, "Automatic Arabic Digit Speech Recognition and Formant Analysis for Voicing Disordered People," 2011 IEEE Symposium on Computers & Informatics, Malaysia, March 2011.

2010

36. Md. Shahadat Hossain, Nusrat Jahan Lisa, Gazi Md. Moshfiqul Islam, Foyzul Hassan, Md. Mahedi Hasan, Sharif Mohammad Musfiqur Rahman, **Ghulam Muhammad** and Mohammad Nurul Huda, "Evaluation of Bangla Word Recognition Performance Using Acoustic Features," ICCAIE 2010, (IEEE Explore), Kuala Lumpur, Malaysia, December, 2010.

35. Mohammed Rokibul Alam Kotwal, Foyzul Hassan, Gazi Md. Moshfiqul Islam, Md. Rakibuzzaman, Md. Mahedi Hasan, Manoj Banik, **Ghulam Muhammad** and Mohammad Nurul Huda, "Bangla Phoneme Recognition for Different Acoustic Features," ICCAIE 2010, (IEEE Explore), Kuala Lumpur, Malaysia, December, 2010.

34. Foyzul Hassan, Qamrun Nahar Eity, Mohammed Rokibul Alam Kotwal, Manoj Banik, Gazi Md. Moshfiqul Islam, Md. Mahedi Hasan, Sharif Mohammad Musfiqur Rahman, **Ghulam Muhammad** and Mohammad Nurul Huda, "Articulatory Δ and ΔΔ Parameters effect on HMM-based classifier for ASR," ICCAIE 2010, (IEEE Explore), Kuala Lumpur, Malaysia, December, 2010.

33. Mubarak O. AlQahtani, **Ghulam Muhammad**, and Mohamed M. Adb-Eldayem, "Environment sound recognition for digital audio forensics using ZC, MFCC and MPEG-7 features," 2010 International Conference on Psychology, Psychological Sciences and Computer Sciences (PPSCS), (IEEE Explore), pp. 34-37, China, December, 2010.

32. Mohammad Nurul Huda, **Ghulam Muhammad**, Md. Shahadat Hossain, Foyzul Hassan, Nusrat Jahan Lisa and Tsuneo Nitta, "An Inhibition/Enhancement Network for Noise Robust ASR," The 13th International Conference on Computer and Information Technology 2010 (ICCIT2010), (IEEE xplore), Bangladesh, December, 2010.

31. Mohammed Rokibul Alam Kotwal, Manoj Bonik, Qamrun Nahar Eity, Mohammad Nurul Huda, **Ghulam Muhammad**, Yousef Ajami Alotaibi, "Bangla Phoneme Recognition for ASR Using Multilayer Neural Network," The 13th International Conference on Computer and Information Technology 2010 (ICCIT2010), (IEEE xplore), Bangladesh, December, 2010.

30. Mohammed Rokibul Alam Kotwal, Md. Shahadat Hossain, Foyzul Hasan, **Ghulam Muhammad**, Moahammad Nurul Huda and Chowdhury Mofizur Rahman, "Bangla Phoneme Recognition Using Hybrid Features," ICECE 2010, Dhaka, Bangladesh, December, 2010.

29. Manoj Banik, Mohammed Rokibul Alam Kotwal, Foyzul Hassan, Gazi Md. Moshfiqul Islam, Sharif Mohammad Musfiqur Rahman, Md. Mahedi Hasan, **Ghulam Muhammad** and Mohammad Nurul Huda, "Effect of Articulatory Δ and ΔΔ Parameters on Multilayer Neural Network based Speech Recognition," APCCAS 2010, (IEEE Explore), Kuala Lumpur, Malaysia, December, 2010.

28. Mohammed Rokibul Alam Kotwal, Foyzul Hassan, Gazi Md. Moshfiqul Islam, Manoj Banik, Md. Mahedi Hasan, Sharif Mohammad Musfiqur Rahman, **Ghulam Muhammad** and Mohammad Nurul Huda, "Bangla Triphone HMM Based Word Recognition," APCCAS 2010, (IEEE Explore), Kuala Lumpur, Malaysia, December, 2010.

27. Mohammed Rokibul Alam Kotwal, Manoj Banik, Gazi Md. Moshfiqul Islam, Md. Shahadat Hossain, Foyzul Hassan, Mohammad Mahedi Hasan, **Ghulam Muhammad** and Mohammad Nurul Huda, "DPF-based Japanese Phoneme Recognition using Tandem MLNs," The 10th International Conference on Hybrid Intelligent System (HIS) 2010, (IEEE xplore) Atlanta, Georgia, USA, August 23-24, 2010.

26. Mohammad Nurul Huda, Mohammad Mahedi Hasan, **Ghulam Muhammad**, Mohammed Rokibul Alam Kotwal, Foyzul Hassan and Md. Shahadat Hossain, "Inhibition/Enhancement of Articulatory features - Which one is Dominant for Speech Recognition," International Conference on Integrated Intelligent Computing (ICIIC) 2010 (IEEE xplore), pp. 51-55, Bangalore, India, August, 2010.

25. Mohammad Nurul Huda, **Ghulam Muhammad**, Mohammad Mahedi Hasan, Sumon Ahmed, Mohammed Rokibul Alam Kotwal and Manoj Banik, "Distinctive Phonetic Features (DPFs)-based isolated word recognition using Multilayer neural networks," International Conference on Integrated Intelligent Computing (ICIIC) 2010 (IEEE xplore), Bangalore, India, August, 2010.

24. Mansour Alsulaiman, Awais Mahmood, **Ghulam Muhammad**, Muhammad A. Bencherif, and Yousef A. Alotaibi, "A Technique to Overcome the Problem of Small Size Database for Automatic Speaker Recognition", Proc. The 5th International Conference on Digital Information Management (ICDIM 2010), (IEEE xplore) Lakehead University, Thunder Bay, Canada, July 05-08, 2010.

23. Mohammad Nurul Huda, **Ghulam Muhammad**, Mohammad Mahedi Hasan, Mohammed Rokibul Alam Kotwal, Gazi Md. Moshfiqul Islam, Md. Shahadat Hossain and Chowdhury Mofizur Rahman, "Which one is dominant for neural network based speech recognition – Δ or ΔΔ articulatory parameters?," 2010 International Conference on Intelligent Computing and Cognitive Informatics (ICICCI 2010), (IEEE xplore), Kuala Lumpur, Malaysia, June, 2010.

22. Mohammad Nurul Huda, **Ghulam Muhammad**, Mohammad Mahedi Hasan, Sharif Mohammad Musfiqur Rahman, Foyzul Hassan and Mohammed Rokibul Alam Kotwal, "Effect of articulatory trajectories on phoneme recognition performance," 2010 International Conference on Intelligent Computing and Cognitive Informatics (ICICCI 2010), (IEEE xplore), Kuala Lumpur, Malaysia, June, 2010.

21. **Ghulam Muhammad**, Yousef A. Alotaibi, Mansour Alsulaiman, and Mohammad Nurul Huda, "Environment Recognition Using Selected MPEG-7 Audio Features and Mel-Frequency Cepstral Coefficients", Proc. the 5th International Conference on Digital Telecommunications (ICDT10), (IEEE xplore), pp. 11-16, Greece, June 13-19, 2010.

20. Mubarak O. AlQahtani, **Ghulam Muhammad**, and Yousef Ajami Alotaibi, "Environment Sound Recognition using Zero Crossing Features and MPEG-7", Proc. the 3rd International Conference on the Applications of Web Information and Digital Technologies (ICADIWT 2010), Turkey, July 2010.

2009

19. Mansour Alsulaiman, **Ghulam Muhammad**, Yousef Alotaibi, Awais Mahmood, and Mohamed A. Bencherif, "Building a Speaker Recognition System with one Sample", Proc. the 2nd Symposium International Computer Science and Computational Technology (ISCSCT '09), Huangshan, P. R. China, pp. 330-334, 26-28, December, 2009.

18. **Ghulam Muhammad** and Khaled Alghathbar, "Environment recognition from audio using MPEG-7 features," Proc. The 4th International Conference on Embedded and Multimedia Computing (EM-Com09), (IEEE xplore), S. Korea, December, 2009.

17. **Ghulam Muhammad**, Yousef A. Alotaibi, and Mohammad Nurul Huda, "Automatic Speech Recognition for Bangla Digits," The 12th International Conference on Computer and Information Technology 2009 (ICCIT2009), (IEEE xplore), Bangladesh, December, 2009.

16. Mohammad Nurul Huda, Manoj Banik, **Ghulam Muhammad**, and Bernd J. Kroger, "Phoneme Recognition based on Distinctive Phonetic Features (DPFs) incorporating Syllable based Language Model," The 12th International Conference on Computer and Information Technology 2009 (ICCIT2009), (IEEE xplore), Bangladesh, December, 2009.

15. **Ghulam Muhammad**, Mubarak O. Al-Qahtani, and Khaled Alghathbar, "Environment recognition for digital audio forensics using MPEG-7 features and separate modeling technique," The 10th International Workshop on Information Security Application (WISA09), Busan, S. Korea, Aug 25-27, 2009.

14. Yousef Ajami Alotaibi, Khondaker Abdullah-Al-Mamun, and **Ghulam Muhammad**, "Noise Effect of Saudi Accented Arabic Alphadigit in Automatic Speech Recognition," Proc. The 2009 International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV'09), Las Vegas, USA, July 13-16, 2009.

2008 and before

13. Yousef A. Alotaibi, Khondaker Abdullah-Al-Mamun, and **Ghulam Muhammad**, "Study on unique Pharyngeal and Uvular consonants in foreign accented Arabic," Proc. INTERSPEECH'08, pp. 751-754, Brisbane, Australia, September 2008.

12. Khondaker Abdullah-Al-Mamun and **Ghulam Muhammad**, "Improved noise reduction with pitch-enabled voice activity detection," Proc. IEEE 4th International Symposium on Image/Video Communications over fixed and mobile networks (ISIVC2008), Bilbao, Spain, July 2008.

11. **Ghulam Muhammad**, "Noise Robust Pitch Detection Based on Extended AMDF," Proc. The 8th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT2008), (IEEE xplore), pp. 133-138, Sarajevo, December 2008.

10. Huda Mohammad Nurul, **Muhammad Ghulam**, Junsei Horikawa, and Tsuneo Nitta, "Distinctive Phonetic Feature (DPF) Based Phone Segmentation using Hybrid Neural Networks," Proc. INTERSPEECH'07, Antwerp, Belgium, August 2007.

09. Huda Mohammad Nurul, **Muhammad Ghulam**, Kouichi Katsurada, Yurie Iribe and Tsuneo Nitta, "Distinctive Phonetic feature (DPF) based phone segmentation using 2-stage multilayer neural networks," RISP International Workshop on Nonlinear Circuits and Signal Processing (NCSP'07), pp. 325-328, Shanghai, China, March 2007.

08. **Muhammad Ghulam**, Junsei Horikawa and Tsuneo Nitta, "Comparative study on contributions of pitch-synchronization and peak-amplitude towards robustness issue of ASR," Proc. INTERSPEECH'06, pp. 373-376, Pittsburgh, September 2006.

07. **Muhammad Ghulam**, Junsei Horikawa and Tsuneo Nitta, "A pitch-synchronous peak-amplitude based feature extraction method for robust ASR," Proc. IEEE International Conference on Acoustics, Speech and Signal processing (ICASSP'06), pp. I-505-508, Toulouse, France, May 2006.

06. Takashi Fukuda, **Muhammad Ghulam**, and Tsuneo Nitta, "Designing multiple distinctive phonetic feature extractors for canonicalization by using clustering technique," Proc. INTERSPEECH'05, pp. 3141-3144, Lisbon, September 2005.

05. **Muhammad Ghulam**, Takashi Fukuda, Junsei Horikawa, and Tsuneo Nitta, "Pitch-synchronous ZCPA (PS-ZCPA)-based feature extraction with auditory masking," Proc. IEEE ICASSP'05, pp. I-517-520, Philadelphia, March 2005.

04. **Muhammad Ghulam**, Takashi Fukuda, Junsei Horikawa, and Tsuneo Nitta, "A noise-robust feature-extraction method based on pitch-synchronous ZCPA for ASR," Proc. INTERSPEECH-ICSLP'04, vol. I, pp.133-136, Korea, October 2004.

03. **Muhammad Ghulam**, Takashi Fukuda, and Tsuneo Nitta, "Voice quality normalization in an utterance for robust ASR," Proc. Eurospeech'03, vol. III, pp. 2173-2176, Geneva, September 2003.

02. **Muhammad Ghulam**, Takashi Fukuda, Takaharu Sato, and Tsuneo Nitta, "Improving performance of an HMM-based ASR system by using monophone-level normalized confidence measure," Proc. ICSLP'02, vol.4, pp.2453-2456, Denver, September 2002.

01. Takaharu Sato, **Muhammad Ghulam**, Takashi Fukuda, and Tsuneo Nitta, "Confidence scoring for accurate HMM-based word recognition by using SM-based monophone score normalization," Proc. IEEE ICASSP'02, pp. I-217-220, Orlando, March 2002.

Scholarships and Awards:

- Research Excellence Award 'Lifetime Achievement' (in the category of Economies of the Future) – 2024, by the Research Development and Innovation Authority (RDIA) and given by the H.E. Minister of Communications and Information Technology, Abdullah Alswaha.

- Best teaching faculty award for Computer Engineering department (2014-2015).
- Top quality research paper award (2018), I got three awards out of total eight awards throughout KSU.
- JSPS Post-Doctoral Research Fellowship from the Ministry of Education, Culture, Sports, Science and Technology (MONBUKAGAKUSHO), Japan for my outstanding research (acceptance rate: 14%) from April 2007.
- Scholarship awarded by MONBUKAGAKUSHO throughout MS and PhD courses, October 2000-March 2006.

Student's Awards Under My Supervision:

- Ahmed Alnasheri, First Prize, The 7th meeting of KSU graduate research, 2016; *Title: Investigation of Frequency Regions for Voice Pathology Detection and Classification*. Advisors: Ghulam Muhammad and Mansour Alsulaiman
- Muneer Al-Hammadi, First Prize, The 10th meeting of KSU graduate research, 2019; *Title: Hand Gesture Recognition using Deep Learning Techniques.* Advisors: Ghulam Muhammad and Abdulwadood Abdulwaheed.
- Yazeed Khalid Musallam, Nasser Ibrahim AlFassam, and Khalid Saleh Alshehri, First Prize, AEC-KSU Best Graduation Project, 2021. *Title: Design of an electroencephalogram (EEG)-based motor imagery classification system*. Supervisor: Ghulam Muhammad
- Hamdi Altaheri, First place award for the best scientific paper in the King Saud University Scientific Forum for Research, Innovation and Talent, 2022. *Title: Attention-based deep learning techniques for decoding motor imagery EEG brain signals*. Advisor: Ghulam Muhammad
- Abdullah Khalid Albrethen, Khalid Bader Alharbi, and Mohammed Abdullah Alswayed, *Title: Design a hand rehabilitation system using a hand exoskeleton*, Third Prize, AEC-KSU Best Graduation Project, 2022. Supervisor: Ghulam Muhammad
- Waleed Albaqami, Muhannad Alanizy, Nasser Alzamil, *Title: NABT - Mobile Robot for Plant Disease Detection*, First Prize, 25th AEC-KSU Best Graduation Project, 2023. Supervisor: Ghulam Muhammad (https://ccis.ksu.edu.sa/en/node/2227)

Research Projects and Grants:

19. *Title*: Highly Cited Review Article (in Economics of the Future)
    Organization: Deputyship for Research and Innovation, Ministry of Education, KSA
    Duration: 2025 (1 year)
    Responsibility: Principal Investigator.
    Amount: 120,000 Saudi Riyals.

18. *Title*: Deep Learning based EEG Brain Control for Hand Rehabilitation of Stroke Patients
    Organization: KSA International Collaboration Grant, Research and Development

Office at the Ministry of Education, KSA
Duration: 2020-2022 (3 years)
Responsibility: Principal Investigator.
Amount: 1.6144 Million Saudi Riyals.

17. *Title*: A Framework for Arabic Media Mining and Information Extraction Using Continuous Domain Semantic Representation
Organization: KSA International Collaboration Grant, Research and Development Office at the Ministry of Education, KSA
Duration: 2020-2022 (3 years)
Responsibility: Co-Principal Investigator.
Amount: 1.8 Million Saudi Riyals.

16. *Title*: High Quality and Impact Research Initiative
Organization: Research and Development Office at the Ministry of Education, KSA
Duration: 2019-2020
Responsibility: Principal Investigator.
Amount: 90,420 Saudi Riyals per contract.

15. *Title*: Computer-Aided Pronunciation Training System for Non-native Learners of the Arabic Language
Organization: Grant Programs for Universities and Research Centers. (Project Number: 3-17-09-001-0003).
Duration: 2018-2020 (two years).
Responsibility: Co- Principal Investigator.
Amount: 750,000 Saudi Riyals.

14. *Title*: Multimodal Healthcare System Research Group.
Organization: KSU Deanship of Scientific Research. (RGP-1436-023)
Duration: 2015-2017 (two years).
Responsibility: Principal Investigator.
Amount: 150,000 Saudi Riyals per year.

13. *Title*: Automatic date fruit inspection system using local texture descriptor in different color spaces
Organization: Research Center, CCIS, KSU. (Project Number: RC140218).
Duration: 2014-2015 (one year).
Responsibility: Principal Investigator.
Amount: 30,000 Saudi Riyals.

12. *Title*: The design and analysis of 3D educational content for learning and memorization processes
Organization: KACST-KSU National Strategic Research Project Grant. (Project Number: 12-INF2582-02).

Duration: 2014-2016 (two years).
Responsibility: Co- Principal Investigator.
Amount: 1,825,000 Saudi Riyals.

11. *Title*: Automatic Voice Pathology Assessment
Organization: KACST-KSU National Strategic Research Project Grant. (Project Number: 12-MED2474-02).
Duration: 2013-2015 (two years).
Responsibility: Co- Principal Investigator.
Amount: 1,999,830 Saudi Riyals.

10. *Title*: Non-intrusive Image Forgery Detection using Multiresolution Framework.
Organization: KACST-KSU National Strategic Research Project Grant. (Project Number: 10-INF1140-02).
Duration: 2012-2013 (two years).
Responsibility: Principal Investigator.
Amount: 1,528,000 Saudi Riyals.

9. *Title*: Haptics-based Health Monitoring and Learning Research Group.
Organization: KSU Deanship of Scientific Research. (RGP-VPP-228)
Duration: 2013-2015 (two years).
Responsibility: Co- Principal Investigator.
Amount: 150,000 Saudi Riyals per year.

8. *Title*: Arabic Speaker Recognition.
Organization: KACST-KSU National Strategic Research Project Grant. (Project Number: 08-INF167-02)
Duration: 2011-2013 (two years).
Responsibility: Co-Principal Investigator.
Amount: 1,098,000 Saudi Riyals.

7. *Title*: Category specific face recognition.
Organization: KACST-KSU National Strategic Research Project Grant. (Project Number: 10-INF1044-02)
Duration: 2011-2013 (two years).
Responsibility: Co-Principal Investigator.
Amount: 1,295,000 Saudi Riyals.

6. *Title*: Automatic voice pathology detection based on MPEG-7 audio descriptors and support vector machine.
Organization: Research Center, CCIS, KSU. (Project Number: RC120910)
Duration: 2012-2013 (one year).
Responsibility: Principal Investigator.

Amount: 30,000 Saudi Riyals.

5. *Title*: Automatic voice pathology detection based on vocal tract area function.
   Organization: Research Center, CCIS, KSU. (Project Number: RC121230)
   Duration: 2013-2014 (one year).
   Responsibility: Principal Investigator.
   Amount: 30,000 Saudi Riyals.

4. *Title*: Environment detection for digital audio forensics.
   Organization: Center of Excellence in Information Assurance, KSU.
   Duration: 2009, six months.
   Responsibility: Principal Investigator.
   Amount: 60,000 Saudi Riyals.

3. *Title*: Pitch detection in noisy environments.
   Organization: Research Center, CCIS, KSU. (Project Number: RC13/428-429)
   Duration: 2008-2009 (one year).
   Responsibility: Principal Investigator.
   Amount: 30,000 Saudi Riyals.

2. *Title*: Study on cannonicalization for robust speech recognition.
   Organization: Japan Society for the Promotion of Science (JSPS), Ministry of Education, Culture, Sports, Science and Technology, Japan. (ID No. P 07080)
   Duration: 2007-2009. (Shortened and completed)
   Responsibility: JSPS Fellow.

1. *Title*: Feature extraction for noise-robust automatic speech recognition.
   Organization: Toshiba Corporation, Japan.
   Duration: 2006-2007.
   Responsibility: Principal Researcher.

Professional Membership:

- International Speech Communication Association (ISCA). (4110)
- Acoustic Society of Japan (ASJ), (not active).
- IEEE, Senior Member. (91229298); IEEE Communications Society; IEEE Industrial Electronics Society; IEEE Instrumentation and Measurement Society; IEEE Signal Processing Society; IEEE Consumer Technology Society.
- Institute of Engineers, Bangladesh (IEB), Fellow. (F-13241)
- ACM, Senior Member. (5060427)

Professional Activities:

Editorial Board member / Technical Committee Member / Program Committee Member

- **Guest Editor**, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, SI: Perception-Driven Enhancement and Detection Methods for Remote Sensing Images in Non-Ideal Environments, 2025.
- **Guest Editor (lead)**, IEEE IoTJ, SI: Challenges and Opportunities of IoT-based Healthcare Industry 5.0, 2024-2025.
- **Guest Editor (lead)**, Information Fusion, SI: Internet of Medical Things (IoMT) Data Fusion, 2023.
- **Guest Editor (lead)**, IEEE Journal of Biomedical and Health Informatics, SI: Insights of Machine Learning into Medical Decision Making Systems: From Research to Practice, 2022.
- **Guest Editor**, IEEE Systems Journal, SI: Advanced Learning-based Support for Large-scale Multi-agent Systems, 2023-2024.
- **Guest Editor (lead)**, Sustainable Cities and Society SI: Internet of Health Things (IoHT)-based Connected Living for Sustainable Smart Cities, 2021.
- **Guest Editor**, Multimedia Systems SI: Deep Learning for Multimedia Healthcare, 2020.
- **Guest Editor**, ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM), SI: AI-empowered Multimedia Data Analytics for Smart Healthcare, 2020.
- **Guest Editor (lead),** Special Issue on Computational Intelligence on Meta Learning for Smart Healthcare, IEEE Computational Intelligence Magazine, 2021-2022.
- **Area Editor**, Information Fusion (Top 2% journal), 2023 -
- **Associate Editor,** IEEE Internet of Things Journal (Top 5% journal), 2023 –
- **Associate Editor**, IEEE Transactions on Affective Computing (Top 10% journal), 2025 -
- **Associate Editor,** Alexandria Engineering Journal, (Top 5% journal), 2023 -
- **Associate Editor,** IEEE Access, Q2
- **Editorial Board** (past), KSU CIS Journal (Q1), 2017 – 2024.
- **Associate Editor**, Expert Systems (Wiley; Q2), 2023 – present.
- **Associate Editor,** Connection Science (Taylor and Francis; Q2), 2024 -
- **Associate Editor,** International Arab Journal on Information Technology, 2011 – 2020
- IEEE Global Communications Conference (IEEE GLOBECOM), The Advances of The Internet of Things and Cloud for Smart Connected Living (Aiotcscl), 9-13 December 2019, Waikoloa, HI, USA
- The International IEEE Workshop on Multimedia Services and Technologies for Smart-health (MUST-SH 2020), London, UK, 2020.
- The International IEEE Workshop on Multimedia Services and Technologies for Smart-health (MUST-SH 2019), Hawaii, USA, 2019.
- The International IEEE Workshop on Multimedia Services and Technologies for Smart-health (MUST-SH 2018), San Diego, USA, 2018.
- The 7th International IEEE Workshop on Multimedia Services and Technologies for E-Health (MUST-EH), in conjunction with IEEE ICME, Hong Kong, 2017.
- Program committee member, KACSTIT2016, the 4th Saudi International Conference on Information Technology, November, Riyadh, Saudi Arabia.
- Advisory committee member, 1st International Conference on Advanced Information and Communication Technology 2016 (ICAICT 2016)
- The 6th International IEEE Workshop on Multimedia Services and Technologies for E-Health (MUST-EH), in conjunction with IEEE ICME, Seattle, USA, 2016.
- EUROCON 2015, Salamanca, Spain, 2015.
- The 5th International IEEE Workshop on Multimedia Services and Technologies for E-Health (MUST-EH), in conjunction with IEEE ICME, Torino, Italy, 2015.

- The second International Conference on Information Technology (ICIT14), Dubai, UAE, 2014.
- 10th International Symposium on Visual Computing (ISVC), Las Vegas, USA, 2014.
- 2013 IEEE Symposium on Computers and Informatics (ISCI 2013), Malaysia, 2013.
- The 3rd International IEEE Workshop on Multimedia Services and Technologies for E-Health (MUST-EH), in conjunction with IEEE ICME, San Jose, USA, 2013.
- 9th International Symposium on Visual Computing (ISVC), Crete, Greece, 2013.
- The 2nd International IEEE Workshop on Multimedia Services and Technologies for E-Health (MUST-EH), in conjunction with IEEE ICME, Melbourne, 2012.
- 2012 IEEE Symposium on Computers and Informatics (ISCI 2012), Malaysia, 2012.
- The First International Conference on Robot, Vision, and Signal Processing, Kaohsiung, Taiwan, 2011
- The 1st International IEEE Workshop on Multimedia Services and Technologies for E-Health (MUST-EH), in conjunction with IEEE ICME, Barcelona, 2011
- 2011 IEEE Symposium on Computers and Informatics (ISCI 2011), Malaysia, 2011.
- 2011 IEEE Symposium on Industrial Electronics and Applications (ISIEA 2011), Malaysia, 2011.
- 2011 IEEE International Conference on Signal and Image Processing Applications (ICSIPA 2011), Malaysia, 2011.
- 2011 IEEE Conference on Computer Applications and Industrial Electronics (ICCAIE 2011), Malaysia, 2011.
- 2010 IEEE Conference on Computer Applications and Industrial Electronics (ICCAIE 2010), Malaysia, 2010.

Community Activities:

- Invited talk, “Palm handling: dataset collection, date fruit type and maturity classification for automatic harvesting,” The 6th International Dates Conference and Exhibition, Riyadh, Kingdom of Saudi Arabia, from November 25th to 26th, 2025, under the theme: “Innovations for Sustainability in the Date Palm Value Chain”.
- Invited talk, “Guide to Writing a Good Thesis Proposal, Selecting Papers, and Exposure,” at CCIS Research Skills Workshop - Fall 2025, 8 October 2025.
- Invited talk, “How to Write an Innovative and Good Research Proposal,” at Al Yamamah University, Riyadh, Kingdom of Saudi Arabia, 4 September 2025.
- Invited talk, “Mobile robot for plant disease detection - A success story from a capstone project to a US patent,” 2025 College (CCIS) Conference, 4 May 2025.