

Awais Mahmood, PhD

Associate Professor | Artificial Intelligence | Machine Learning | Healthcare AI | Data Science and Big Data Analytics

College of Applied Computer Science (CACS), King Saud University (Almuzahmiya Branch), Riyadh, Saudi Arabia

Iqama status: Premium residency

☎ +966-545-798315

✉ mawais@ksu.edu.sa | awais.mahmood@gmail.com



Professional Summary

Associate Professor with over **25 years of academic, research, and industry experience** in Computer Engineering and Applied Computer Science. Specialized in **machine learning, deep learning, Data Science, signal processing, speaker recognition, phonocardiography, and AI-driven healthcare applications**. Proven track record of **high-impact publications (IEEE Access, Diagnostics, Sensors, Applied Sciences, Multimedia Tools & Applications)**, funded national projects, and graduate/postgraduate supervision. Experienced educator committed to outcome-based learning and research-led teaching.

Academic & Professional Experience

Associate Professor

King Saud University, Riyadh, Saudi Arabia
December 2021 – Present

- Teaching undergraduate courses in Applied Computer Science - Conducting research in AI, Data Science, machine learning, healthcare signal analysis, and computer vision - Supervising undergraduate and postgraduate research projects - Active contributor to high-impact journal publications

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- Conducting research in AI, machine learning, healthcare signal analysis, and computer vision
- Supervising undergraduate and postgraduate research projects

- Active contributor to high-impact journal publications
- **Member of key academic and administrative committees**, including:
 - ✓ Examination Committee
 - ✓ Quality Assurance Committee
 - ✓ E-Transaction Committee
 - ✓ Student Advisory Committee
 - ✓ HR Committee
- **Supervised numerous undergraduate capstone projects**; students frequently achieved **top positions in internal and external project competitions**

Assistant Professor

King Saud University, Riyadh, Saudi Arabia

August 2014 – November 2021 - Delivered undergraduate courses in Computer Science and Engineering - Conducted funded research in speaker recognition and medical signal processing - Published extensively in ISI- and Scopus-indexed journals

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Researcher / PhD Scholar

King Saud University, Riyadh, Saudi Arabia

January 2008 – August 2014 - Research focus: **Speaker Recognition Systems** - Successfully completed **KACST-funded national project: Arabic Speaker Recognition** - Defended PhD dissertation in January 2014 - Assisted faculty in Computer Engineering courses

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Assistant Professor

GIFT University, Gujranwala, Pakistan

September 2003 – October 2007 - Taught undergraduate and graduate-level Computer Science courses - Roles included: Student Advisor, Activity Coordinator, Technical Training Coordinator

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- Roles included: Student Advisor, Activity Coordinator, Technical Training Coordinator

Research & Teaching Assistant

Eastern Mediterranean University (EMU), TRNC, Turkey

February 2001 – July 2003 - Research in speaker classifier fusion and recognition systems - Delivered tutorials, labs, and lectures - Student advising and academic mentoring

Industry & Technical Roles (Early Career)

- **System/Network Administrator**, EMU (2000–2001)
 - **Web Developer / Program Analyst**, Soft Shake, Pakistan (2000)
 - **Hardware & Network Engineer (Intern)**, Bank of Punjab, Pakistan (2000)
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Education

PhD in Computer Engineering

King Saud University, Riyadh, Saudi Arabia — 2014

Dissertation: *A Multidimensional Feature Extraction Technique for Speaker Recognition*

MS in Computer Engineering

Eastern Mediterranean University, TRNC, Turkey — 2003

BS in Computer Engineering

Eastern Mediterranean University, TRNC, Turkey — 2001

Achievement: 2nd Position in Department

BSc in Mathematics & Physics

University of the Punjab, Lahore, Pakistan — 1995

Research Interests

- Machine Learning & Deep Learning
- Data Science Big Data Analytics
- Healthcare AI (PCG, Voice Pathology, Medical Imaging)
- Speaker & Speech Recognition
- Signal Processing
- Computer Vision
- Explainable AI (XAI)

Honors & Scholarships

- 100% PhD Scholarship – King Saud University

- 100% MS Scholarship – EMU
 - 70% BS Scholarship
 - High Honors Certificate (6 semesters)
 - Department Rank: 2nd Position (Undergraduate)
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Funded Projects

- [1] **Title:** *Heart Disease identification and classification.*
Organization: *KSU Deanship of Scientific Research and Ministry of Education. (IFKSUDR_H225)*
Duration: *two years.*
Responsibility: *Principal investigator.*
Amount: *500,000 Saudi Riyals per year.*
- [2] **Title:** *AI in health care.*
Organization: *KSU Deanship of Scientific Research. (RGP-1436-023)*
Duration: *two years.*
Responsibility: *Co-PI.*
Amount: *150,000 Saudi Riyals per year.*
- [3] **Title:** *AI and machine learning Research Group.*
Organization: *KSU Deanship of Scientific Research. (RGP-1439-039)*
Duration: *two years .*
Responsibility: *Co. PI.*
Amount: *150,000 Saudi Riyals.*
- [4] **Title:** *Machine learning Research Group.*
Organization: *KSU Deanship of Scientific Research. (RGP-1438-071)*
Duration: *(two years + two years).*
Responsibility: *Co.PI.*
Amount: *150,000 Saudi Riyals per two year.*
- [5] **Title:** *Automatic Voice Pathology Assessment*
Funding Agency: *KACST-KSU National Strategic Research Project Grant. (Project Number: 12-MED2474-02).*
Duration: *2013-2015 (two years).*
Responsibility: *Researcher.*
Amount: *1,999,830 Saudi Riyals.*
- [6] **Title** *Arabic Speaker Recognition*
Funding Agency: *KSU–KACST National Plan for Science and Technology (Project Number: 08-INF167-02)*

Role: PhD Researcher
Duration: 2 Years
Grant Amount: SAR 1.098 Million

Publications and citations

Google Scholar: https://scholar.google.com/citations?user=loZ_zNgAAAAJ&hl=en

Journal Papers

- 1 Malik, W.; Fahiem, M.A.; Farhat, T.; Alghazo, R.; Mahmood, A.; Alhajlah, M. An Explainable Deep Learning Framework for Multimodal Autism Diagnosis Using XAI GAMI-Net and Hypernetworks. *Diagnostics* 2025, 15, 2232. <https://doi.org/10.3390/diagnostics15172232>
- 2 A. R. Altaf, H. Mahdin, A. Mahmood, A. Altaf, M. Hussain, and S. Islam, "Elevating voice diagnostics: SAVA unleashes new frontiers in healthy and pathological voice detection," *Journal of Theoretical and Applied Information Technology*, vol. 103, no. 14, 2025.
- 3 A. Mahmood, M. Alhajlah, H. Dhahri and A. Almaslukh, "Lorenz-PSO Optimized Deep Neural Network for Enhanced Phonocardiogram Classification," in *IEEE Access*, vol. 13, pp. 84645-84658, 2025, doi: 10.1109/ACCESS.2025.3569327.
- 4 Lal Khan, Atika Qazi, Hsien-Tsung Chang, Mousa Alhajlah, Awais Mahmood. Empowering Urdu sentiment analysis: an attention-based stacked CNN-Bi-LSTM DNN with multilingual BERT. *Complex Intell. Syst.* 11, 10 (2025). <https://doi.org/10.1007/s40747-024-01631-9>
- 5 A. ALTAF, H. MAHDIN2, A. MAHMOOD, A. ALTAF, An Innovative Machine Learning Framework for Phonocardiography (PCG) Using MFCC And Deep Extreme Learning Machine (DELM). *Journal of Theoretical and Applied Information Technology*, 30th November 2024. Vol.102. No. 22
- [6] A. Mahmood, H. Dhahri, M. Alhajlah and A. Almaslukh, "Enhanced Classification of Phonocardiograms Using Modified Deep Learning," in *IEEE Access*, vol. 12, pp. 178909-178916, 2024, doi: 10.1109/ACCESS.2024.3507920.
- [7] Almutiry, O., Iqbal, K., Hussain, S., Mahmood, A. & Dhahri, H. Underwater images contrast enhancement and its challenges: a survey. *Multimed Tools Appl* 83, 15125–15150 (2024). <https://doi.org/10.1007/s11042-021-10626-4>
- [8] Mahmood, A. Arabic speaker recognition system based on phoneme fusion. *Multimed Tools Appl* 83, 15043–15060 (2024). <https://doi.org/10.1007/s11042-020-08893-8>
- [9] Shahzad, H.M.; Bhatti, S.M.; Jaffar, A.; Akram, S.; Alhajlah, M.; Mahmood, A. Hybrid Facial Emotion Recognition Using CNN-Based Features. *Appl. Sci.* 2023, 13, 5572. <https://doi.org/10.3390/app13095572>
- [10] Ali, R.; Farhat, T.; Abdullah, S.; Akram, S.; Alhajlah, M.; Mahmood, A.; Iqbal, M.A. Deep Learning for Sarcasm Identification in News Headlines. *Appl. Sci.* 2023, 13, 5586. <https://doi.org/10.3390/app13095586>

- [11] Mahmood, A.; Mehroz Khan, M.; Imran, M.; Alhajlah, O.; Dhahri, H.; Karamat, T. End-to-End Deep Learning Method for Detection of Invasive Parkinson's Disease. *Diagnostics* 2023, 13, 1088. <https://doi.org/10.3390/diagnostics13061088>
- [12] Altaf, A., Mahdin, H., Maskat, R., Shaharudin, S. M., Altaf, A., & Mahmood, A. (2023). A novel voice feature AVA and its application to the pathological voice detection through machine learning. *International Journal of Advanced Computer Science and Applications*, 14(9), 1085–1092. <https://doi.org/10.14569/IJACSA.2023.01409113>
- [13] Altaf, A., Mahdin, H., Mahmood, A., Ninggal, M. I. H., Altaf, A., & Javid, I. (2023). Systematic review for phonocardiography classification based on machine learning. *International Journal of Advanced Computer Science and Applications*, 14(8), 806–817. <https://doi.org/10.14569/IJACSA.2023.0140889>
- [14] Altaf, A., Mahdin, H., Mahmood, A., Ninggal, M. I. H., Altaf, A., & Javid, I. (2023). Systematic review for phonocardiography classification based on machine learning. *International Journal of Advanced Computer Science and Applications*, 14(8), 806–817. <https://doi.org/10.14569/IJACSA.2023.0140889>
- [15] Alhajlah, M., Noor, M. N., Nazir, M., Mahmood, A., Ashraf, I., & Karamat, T. (2023). Gastrointestinal diseases classification using deep transfer learning and features optimization. *Computers, Materials & Continua*, 75(1), 2227–2245. <https://doi.org/10.32604/cmc.2023.031890>
- [16] Rafiq, A.; Imran, M.; Alhajlah, M.; Mahmood, A.; Karamat, T.; Haneef, M.; Alhajlah, A. Deep Feature Extraction for Detection of COVID-19 Using Deep Learning. *Electronics* 2022, 11, 4053. <https://doi.org/10.3390/electronics11234053>
- [17] Khalil, M.I.; Rehman, S.U.; Alhajlah, M.; Mahmood, A.; Karamat, T.; Haneef, M.; Alhajlah, A. Deep-COVID: Detection and Analysis of COVID-19 Outcomes Using Deep Learning. *Electronics* 2022, 11, 3836. <https://doi.org/10.3390/electronics11223836>
- 18 Othman, E.; Mahmoud, M.; Dhahri, H.; Abdulkader, H.; Mahmood, A.; Ibrahim, M. Automatic Detection of Liver Cancer Using Hybrid Pre-Trained Models. *Sensors* 2022, 22, 5429. <https://doi.org/10.3390/s22145429>
- 19 Rizk-Allah, R.M.; Abdulkader, H.; Elatif, S.S.A.; Elkilani, W.S.; Al Maghayreh, E.; Dhahri, H.; Mahmood, A. A Novel Binary Hybrid PSO-EO Algorithm for Cryptanalysis of Internal State of RC4 Cipher. *Sensors* 2022, 22, 3844. <https://doi.org/10.3390/s22103844>
- 20 Awassa, L.; Jdey, I.; Dhahri, H.; Hcini, G.; Mahmood, A.; Othman, E.; Haneef, M. Study of Different Deep Learning Methods for Coronavirus (COVID-19) Pandemic: Taxonomy, Survey and Insights. *Sensors* 2022, 22, 1890. <https://doi.org/10.3390/s22051890>
- 21 Ashraf, A. H., Imran, M., Qahtani, A. M., Alsufyani, A., Almutiry, O., Mahmood, A., & Habib, M (2021). Weapons Detection for Security and Video Surveillance Using CNN and YOLO-V5s. *CMC* 1–15.

- 22 A. Mahmood, M. Imran, A. Irtaza, Q. Abbas, H. Dhahri et al., "Hybrid evolutionary algorithm based relevance feedback approach for image retrieval," *Computers, Materials & Continua*, vol. 70, no.1, pp. 963–979, 2022.
- 23 Al Maghayreh, E., Dhahri, H., Albogamy, F., Alrahal, M., Mahmood, A., Othman, E., & Elkilani, W. (2021). Particle Swarm Optimization Algorithm for Detecting Distributed Predicates. *IEEE Access*.
- 24 Singh, Pradeep Kumar, Esam Othman, Rafeeq Ahmed, Awais Mahmood, Habib Dhahri, and Prasenjit Choudhury. "Optimized recommendations by user profiling using apriori algorithm." *Applied Soft Computing* 106 (2021): 107272.
- 25 Riaz, Ayesha, Naveed Riaz, Awais Mahmood, Khan Sajid Ali, Imran Mahmood, Omar Almutiry, and Dhahri Habib. "ExpressionHash: Securing Telecare Medical Information Systems Using BioHashing." *Computers, Materials, & Continua* (2021): 2747-2764.
- 26 Almutiry, O., Ayaz, M., Sadad, T., Lali, I. U., Mahmood, A. et al. (2021). A Novel Framework for Multi-Classification of Guava Disease. *CMC-Computers, Materials & Continua*, 69(2), 1915–1926.
- 27 Almutiry, O., Iqbal, K., Hussain, S., Mahmood, A., & Dhahri, H. (2021). Underwater images contrast enhancement and its challenges: a survey. *Multimedia Tools and Applications*, 1-26.
- 28 Dhahri, H., Rahmany, I., Mahmood, A., Al Maghayreh, E., & Elkilani, W. (2020). Tabu search and machine-learning classification of benign and malignant proliferative breast lesions. *BioMed research international*, 2020.
- 29 Dhahri, H., Al Maghayreh, E., Mahmood, A., Elkilani, W., & Faisal Nagi, M. (2019). Automated breast cancer diagnosis based on machine learning algorithms. *Journal of healthcare engineering*, 2019.
- 30 Awais Mahmood, Sajid Ali Khan, Shariq Hussain, Eslam Mohammad Almaghayreh, "An Adaptive Image Contrast Enhancement Technique for Low-Contrast Images " *IEEE Access*, Vol. 7, pages 161584 – 161593, November 2019, DOI: 10.1109/ACCESS.2019.2951468
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- [32] Awais Mahmood, Shariq Hussain, Khalid Iqbal, and Wail S. Elkilani, "Recognition of Facial Expressions under Varying Conditions Using Dual-Feature Fusion" *Mathematical Problems in Engineering* Volume 2019, <https://doi.org/10.1155/2019/9185481>
- [33] Awais Mahmood, Ghulam Muhammad, Mansour Alsulaiman, Habib Dhahri, Esam Othman, Mohammed Faisal: "Moving average multi directional local features for speaker recognition". *Cluster Computing* Vol. 22(Suppl 1): 2145-2157 (2019)
- [34] Mohamad Mahmoud Al Rahhal, Mohamed Lamine Mekhalfi, Mawloud Guermoui, Esam Othman, Baiying Lei, Awais Mahmood:

- "A Dense Phase Descriptor for Human Ear Recognition". IEEE Access 6: 11883-11887 (2018)
- [35] Mansour Alsulaiman, Awais Mahmood, Ghulam Muhammad, "Speaker recognition based on Arabic phonemes," Speech Communication, vol. 86, pp. 42-51, February 2017. DOI: 10.1016/j.specom.2016.11.004 [ISI indexed]
- [36] Awais Mahmood, Mansour Alsulaiman, Ghulam Muhammad, Sheeraz Akram: Artificially intelligent recognition of Arabic speaker using voice print-based local features. J. Exp. Theor. Artif. Intell. 28(6): 1009-1020 (2016) [ISI indexed]
- [37] Awais Mahmood, Mansour Alsulaiman, and Ghulam Muhammad, "Automatic Speaker Recognition using Multi Directional Local Features (MDLF)," Arabian Journal of Science and Engineering, Accepted, 2013. (ISI indexed with impact factor 0.385)
- [38] Mansour Alsulaiman, Ghulam Muhammad, Mohamed Bencherif, Awais Mahmood and Zulfiqar Ali, "KSU Rich Arabic Speech Database," Information Journal, Vol.16, No.6(B), pp. 4231-4254, June 2013. (ISI index with Impact Factor of 0.250)
- [39] Ghulam Muhammad, Tamer Mesallam, Khalid Almalki, Mohamed Farahat, Awais Mahmood, and Mansour Alsulaiman, "Multi Directional Regression (MDR) Based Features for Automatic Voice Disorder Detection," Journal of Voice, Elsevier, Accepted, 2012. (ISI index with Impact Factor of 1.39)
- [40] Mansour Alsulaiman, Youssef Alotaibi, Muhammad Ghulam, Mohamed A. Bencherif and Awais Mahmood, "Arabic Speaker Recognition: Babylon Levantine Subset Case Study", Journal of Computer Science, USA 6 (4): 381-385, 2010
- [41] M. Alsulaiman, Awais Mahmood, Y. Alotaibi and M. A. Bencherif , "Review of Arabic Speaker Recognition", Al-Azhar University Engineering journal, JAUES. Vol. 3, No. 17, Dec. 2008, pp: 419-429.
- [41] Awais Mahmood, "Linear Classifier Fusion for Speaker Identification System", Al-Azhar University Engineering journal, JAUES. Vol. 3, No. 17, Dec. 2008, pp: 364-371.

Research Report

- [1] M. Alsulaiman, Y. Alotaibi, Awais Mahmood and M. A. Bencherif , "Survey of Arabic Speaker Recognition" research report CCIS journal, King Saud University, Saudi Arabia.

Conference Papers

- [1] Awais Mahmood, "A Solution to the Security Authentication Problem in Smart Houses Based on Speech" Procedia Computer Science Volume 155, 2019, Pages 606-611

- [2] Zulfiqar Ali, Mansour Alsulaiman, Ghulam Muhammad, Ahmed Al-Nasheri, and Awais Mahmood, "Clinical Informatics: Mining of Pathological Data by Acoustic Analysis," International Congress in Health Informatics (ICHI), Riyadh, Saudi Arabia, 21-23 February 2017.
- [3] Mohamed A. Bencherif, Mansour Alsulaiman, Ghulam Muhammad, Zulfiqar Ali, Awais Mahmood, "Gender Effect in Trait Recognition", International Conference on Signal Processing and Image Engineering 2012, San Francisco, USA.
- [4] Awais Mahmood, Mansour Alsulaiman, and Ghulam Muhammad, "Multidirectional Local Features for Speaker Recognition", ISMS 2012, February 2012, Kota Kinabalu, Malaysia.
- [5] Awais Mahmood, Mansour M. Alsulaiman, Ghulam Muhammad, and Mohamed A. Bencherif, "Verification of A Rich Arabic Speech Database", COCODA 2011, October, Taiwan.
- [6] Mansour M. Alsulaiman, Ghulam Muhammad, Mohamed A. Bencherif, Awais Mahmood, Zulfiqar Ali, and Mohammad Aljabri, "Building a Rich Arabic Speech Database", The Fifth Asia International Conference on Mathematical Modeling and Computer Simulation (AMS '11), May 23, Malaysia.
- [7] Ghulam Muhammad, Mansour M. Alsulaiman, Zulfiqar Ali and Awais Mahmood, "Automatic Voice Disorder Classification using Vowel Formants", The 2011 IEEE International Conference on Multimedia and Expo (ICME 2011), July 11-15, 2011, Barcelona.
- [8] 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 (ICCV'11), July 18-21, 2011, USA.
- [9] 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.
- [10] Mansour Alsulaiman, Ghulam Muhammad, Yousef Alotaibi, Awais Mahmood, and Mohamed Abdelkader Bencherif " Building a Speaker Recognition System with one Sample", Proceedings of the Second Symposium International Computer Science and Computational Technology (ISCSCT '09) Huangshan, P. R. China, 26-28, Dec. 2009, pp. 330-334.

Speech Corpus

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>

Professional Service & Activities

- Reviewer for IEEE Access, Sensors, Diagnostics, Applied Sciences
 - Student advisor and academic mentor
 - Active collaborator in interdisciplinary healthcare AI research
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