

Ghulam Muhammad

Professor, Dept. of Computer Engineering
College of Computer and Information Sciences
King Saud University, P.O. Box: 51178, Riyadh 11543, Saudi Arabia.
Email: ghulam@ksu.edu.sa, ghulam@ccis.edu.sa
Webpage: <http://faculty.ksu.edu.sa/ghulam/>
Phone: +966 11 4696281 (Office)
FAX: +966 11 4676990 (Office)

Education:

Ph.D. March 2006

Electronics 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

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 – 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), Digital signal processing (CEN352); Introduction to digital control (CEN455); Digital speech processing (CEN460).

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).

Thesis Supervision:

Ph.D. Supervision

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*

Master Thesis / Project Supervision

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 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 – present)

Research Interest:

- Multimedia Forensics.
- Noise Robust Automatic Speech Recognition.
- Speech Signal Processing.
- Digital Image Processing.
- Face, Fingerprint, Palm print Recognition.
- Healthcare

Publications:

Patent

“Environment recognition of audio input”, US Application No.: 13/183,424, Filed: July 14, 2011; US Patent No.: 8,812,310 B2, Issue date: August 19, 2014; Inventors: **Ghulam Muhammad** and Khaled S. Alghathbar.

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>

Journal Publications

2017

75. M. Shamim Hossain, Mohammed F. Alhamid, **Ghulam Muhammad**, “Collaborative Analysis Model for Trending Images on Social Networks,” *Future Generation Computer Systems*, 2017. DOI: 10.1016/j.future.2017.01.030 [*ISI indexed*]
74. **Ghulam Muhammad** and M. F. Alhamid, “User Emotion Recognition from a Larger Pool of Social Network Data Using Active Learning,” *Multimedia Tools and Applications*, 2016. DOI: 10.1007/s11042-016-3912-2 [*ISI indexed*]
73. Zulfiqar Ali, Mansour Alsulaiman, **Ghulam Muhammad**, Irraivan Elamvazuthi, Ahmed Al-nasheri, Tamer A. Mesallam, Mohamed Farahat, and Khalid H. Malki, “Intra- and Inter-

Database Study for Arabic, English, and German Databases: Do Conventional Speech Features Detect Voice Pathology?" *Journal of Voice*, 2016. DOI: 10.1016/j.jvoice.2016.09.009 [*ISI indexed*]

72. Mohammed Algabri, Mohamed Bencherif, Mansour Alsulaiman, **Ghulam Muhammad**, and Mohamed Amine Mekhtiche, "Soft Computing Techniques for Classification of Voiced/Unvoiced Phonemes," *Intelligent Automation & Soft Computing (Autosoft)*, 2017. DOI: 10.1080/10798587.2017.1278961 [*ISI indexed*]
71. M. Shamim Hossain and **Ghulam Muhammad**, "An emotion recognition system for mobile applications," *IEEE Access*, 2017. DOI: 10.1109/ACCESS.2017.2672829. [*ISI indexed*]
70. **Ghulam Muhammad**, M. F. Alhamid, M. Shamim Hossain, Ahmed S. Almogren, and Athanasios Vasilakos, "Enhanced Living by Assessing Voice Pathology Using Co-occurrence Matrix," *Sensors*, 17(2), 267, January 2017. DOI: 10.3390/s17020267 [*ISI indexed*]
69. Amani Alahmadi, Muhammad Hussain, Hatim Aboalsamh, **Ghulam Muhammad**, George Bebis, and Hassan Mathkour, "Passive Detection of Image Forgery using DCT and Local Binary Pattern," *Signal, Image and Video Processing*, vol. 11, no. 1, pp. 81-88, January 2017. DOI 10.1007/s11760-016-0899-0 [*ISI indexed*]
68. Ahmed Al-nasheri, **Ghulam Muhammad**, Mansour Alsulaiman, Zulfiqar Ali, Tamer A. Mesallam, Mohamed Farahat, Khalid H. Malki, and Mohamed A. Bencherif, "An Investigation of Multi-Dimensional Voice Program Parameters in Three Different Databases for Voice Pathology Detection and Classification," *Journal of Voice*, vol. 31, issue 1, pp. 113.e9–113.e18, January 2017. DOI: 10.1016/j.jvoice.2016.03.019 [*ISI indexed*]
67. Ahmed Al-nasheri, **Ghulam Muhammad**, Mansour Alsulaiman, and Zulfiqar Ali, "Investigation of Voice Pathology Detection and Classification on Different Frequency Regions Using Correlation Functions," *Journal of Voice*, vol. 31, issue 1, pp. 3-15, 2017. DOI: 10.1016/j.jvoice.2016.01.014 [*ISI indexed*]
66. 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*]
65. M. Shamim Hossain, Md. Abdur Rahman, and **Ghulam Muhammad**, "Cyber Physical Cloud-Oriented Multi-Sensory Smart Home Framework for Elderly People: An Energy Efficiency Perspective," *Journal of Parallel and Distributed Computing*, vol. 103, pp. 11-21, May 2017. DOI: 10.1016/j.jpdc.2016.10.005 [*ISI indexed*]
64. **Ghulam Muhammad**, S. K. Md. Mizanur Rahman, Abdulhameed Alelaiwi and Atif Alamri, "Smart health solution integrating IoT and cloud: a case study of voice pathology monitoring," *IEEE Communications Magazine*, vol. 55, issue 1, pp. 69-73, January 2017. DOI: 10.1109/MCOM.2017.1600425CM [*ISI indexed*]
63. **Ghulam Muhammad**, Mansour Alsulaiman, Zulfiqar Ali, Tamer A. Mesallam, Mohamed Farahat, Khalid H. Malki, Ahmed Al-nasheri, and Mohamed A. Bencherif, "Voice Pathology Detection using Interlaced Derivative Pattern on Glottal Source Excitation," *Biomedical Signal*

Processing and Control, vol. 31, pp. 156-164, January 2017. DOI: 10.1016/j.bspc.2016.08.002 [ISI indexed]

2016

62. M. Shamim Hossain and **Ghulam Muhammad**, "Healthcare Big Data Voice Pathology Assessment Framework," IEEE Access vol. 4, no. 1, pp. 7806-7815, 2016. DOI: 10.1109/ACCESS.2016.2626316 [ISI indexed]
61. M. Shamim Hossain, M. Moniruzzaman, **Ghulam Muhammad**, Ahmed Al Ghoneim, and Atif Alamri, "Big Data-Driven Service Composition Using Parallel Clustered Particle Swarm Optimization in Mobile Environment," IEEE Transactions on Services Computing, vol. 9, no. 5, pp. 806-817, September/October 2016. DOI: 10.1109/TSC.2016.2598335 [ISI indexed]
60. **Ghulam Muhammad**, Muhammad Hussain, Muneer Al-Hammadi, Hatim Aboalsamh, Hassan Mathkour, and Amir Saeed Malik, "Short-term and Long-term Memory Analysis of Learning Using 2D and 3D Educational Contents," Behaviour & Information Technology, vol. 35, no. 11, pp. 958-967, 2016. DOI: 10.1080/0144929X.2016.1212094 [ISI indexed]
59. M. Shamim Hossain and **Ghulam Muhammad**, "Authenticated media uploading framework for mobile cloud computing," Memetic Computing, vol. 8, no. 4, pp. 325-332, December 2016. DOI: 10.1007/s12293-016-0200-7 [ISI indexed]
58. M. Shamim Hossain, **Ghulam Muhammad**, S. K. Md. Mizanur Rahman, Wadood Abdul, Abdulhameed Alelaiwi and Atif Alamri, "Towards End-to-End Biometric-based Security for IoT Infrastructure," IEEE Wireless Communications Magazine, vol. 23. no. 5, pp. 44-51, October 2016. DOI: 10.1109/MWC.2016.7721741 [ISI indexed]
57. Md Mohaimenuzzaman, S. M. Monzurur Rahman, Musaed Alhussein, **Ghulam Muhammad**, and Khondaker Abdullah Al Mamun, "Enhancing Safety in Water Transport System based on Internet of Things for Developing Countries," International Journal of Distributed Sensor Networks, 2016, Article ID 2834616, 10 pages, 2016. DOI:10.1155/2016/2834616 [ISI indexed]
56. **Ghulam Muhammad**, Ghadir Altuwaijri, Mansour Alsulaiman, Zulfiqar Ali, Tamer A. Mesallam, Mohamed Farahat, Khalid H. Malki, and Ahmed Al-nasheri, "Automatic Voice Pathology Detection and Classification Using Vocal Tract Area Irregularity," Biocybernetics and Biomedical Engineering, vol. 36, no. 2, pp. 309-317, 2016. DOI: 10.1016/j.bbe.2016.01.004 [ISI indexed]
55. Abdulhameed Alelaiwi, Wadood Abdul, M. Solaiman Dewan, Mahmoud Migdadi, and **Ghulam Muhammad**, "Steerable pyramid transform and local binary pattern based robust face recognition for e-Health secured login," Computers and Electrical Engineering, vol. 53, pp. 435-443, July 2016. DOI: 10.1016/j.compeleceng.2016.01.008 [ISI indexed]
54. M. Shamim Hossain and **Ghulam Muhammad**, "Cloud-Assisted Industrial Internet of Things (IIoT)-enabled Framework for Health Monitoring," Computer Networks, vol. 101, pp. 192-202, 2016. DOI: 10.1016/j.comnet.2016.01.009 [ISI indexed]

53. M. Shamim Hossain, **Ghulam Muhammad**, M. F. Alhamid, Biao Song, and Khaled Al-Mutib, "Audio-Visual Emotion Recognition Using Big Data Towards 5G," *Mobile Networks and Applications*, vol. 221, no. 5, pp. 753-763, October 2016. DOI: 10.1007/s11036-016-0685-9 [ISI indexed]
52. Saeed Bamatraf, Muhammad Hussain, Hatim A. Aboalsamh, Qazi Emad-Ul-Haq, Aamir Saeed Malik, HafeezUllah Amin, Hassan Mathkour, **Ghulam Muhammad** and Hafiz Muhammad Imran, "A System for True and False Memory Prediction based on 2D and 3D Educational Contents and EEG Brain Signals," *Computational Intelligence and Neuroscience*, Volume 2016 (2016), Article ID 842687, 11 pages, 2016. DOI: 10.1155/2016/8491046 [ISI indexed]
51. Zulfiqar Ali, Irraivan Elamvazuthi, Mansour Alsulaiman, and **Ghulam Muhammad**, "Detection of Voice Pathology using Fractal Dimension in a Multiresolution Analysis of Normal and Disordered Speech Signals," *Journal of Medical Systems*, vol. 40, issue. 20, 10 pages, 2016. DOI 10.1007/s10916-015-0392-2 [ISI indexed]
50. Zulfiqar Ali, Irraivan Elamvazuthi, Mansour Alsulaiman, and **Ghulam Muhammad**, "Automatic Voice Pathology Detection with Running Speech by Using Estimation of Auditory Spectrum and Cepstral Coefficients Based on the All-Pole Model," *Journal of Voice*, vol. 30, Issue 6, pp. 757.e7–757.e19, November 2016. DOI: 10.1016/j.jvoice.2015.08.010 [ISI indexed]
49. M. Shamim Hossain and **Ghulam Muhammad**, "Audio-Visual Emotion Recognition using Multi-Directional Regression and Ridgelet Transform," *Journal on Multimodal User Interfaces*, vol. 10, no. 4, pp. 325-333, 2016. DOI: 10.1007/s12193-015-0207-2 [ISI indexed] IF: 0.797
48. Zulfiqar Ali, Mansour Alsulaiman, Irraivan Elamvazuthi, **Ghulam Muhammad**, Tamer A. Mesallam, Mohamed Farahat, Khalid H. Malki, "Voice pathology detection based on the modified voice contour and SVM," *Biologically Inspired Cognitive Architectures*, vol. 15, pp. 10-18, January 2016. DOI: 10.1016/j.bica.2015.10.004 [ISI indexed]
47. Awais Mahmood, Mansour Alsulaiman, **Ghulam Muhammad**, Sheeraz Akram, "Artificially Intelligent Recognition of Arabic Speaker using Voice Print Based Local Features," *Journal of Experimental & Theoretical Artificial Intelligence*, vol. 28, no. 6, pp. 1009-1020, October 2016. DOI: 10.1080/0952813X.2015.1055827 [ISI indexed]
46. Q. Fang, C. Xu, M. Shamim Hossain, and **Ghulam Muhammad**, "STCAPLRS: A Spatial-Temporal Context-Aware Personalized Location Recommendation System," *ACM Transactions on Intelligent Systems and Technology*, (ACM TIST), vol. 7, no. 4, Article 59, March 2016, 30 pages. DOI: 10.1145/2842631 [ISI indexed]

2015

45. Q. Fang, C. Xu, J. Sang, M. Shamim Hossain, and **Ghulam Muhammad**, "Word-of-Mouth Understanding Multimodal Aspect-Opinion Mining in Social Media," *IEEE Transactions on Multimedia*, vol. 17, no. 12, pp. 2281-2296, December 2015. DOI: 10.1109/TMM.2015.2491019 [ISI indexed]
44. Musaed Alhussein and **Ghulam Muhammad**, "Watermarking of Parkinson Disease Speech in Cloud-Based Healthcare Framework," *International Journal of Distributed Sensor Networks*, Volume 2015, Article ID 264575, 9 pages, 2015. DOI: 10.1155/2015/264575 [ISI indexed]

43. M. Shamim Hossain, **Ghulam Muhammad**, Biao Song, Mehedi Hassan, Abdulhameed Alelaiwi, Atif Alamri, "Audio-Visual Emotion-Aware Cloud Gaming Framework," IEEE Transactions on Circuits and Systems for Video Technology, vol. 25, no. 12, pp. 2105-2118, December 2015. DOI: 10.1109/TCSVT.2015.2444731 [*ISI indexed*]
42. M. Shamim Hossain and **Ghulam Muhammad**, "Cloud-Assisted Speech and Face Recognition Framework for Health Monitoring," ACM/Springer Mobile Networks and Applications (MONET), vol. 20, no. 3, pp. 391-399, 2015. DOI: 10.1007/s11036-015-0586-3 [*ISI indexed*]
41. M. Hussain, Sahar Q. Saleh, George Bebis, **Ghulam Muhammad**, H. Aboalsamh, and Hassan Mathkour, "Evaluation of Image Forgery Detection Using Multi-Scale Weber Local Descriptors," International Journal on Artificial Intelligence Tools, vol. 24, no. 4, pp. 1540016 (28 pages), 2015. DOI: 10.1142/S0218213015400163 [*ISI indexed*]
40. **Ghulam Muhammad**, "Automatic speech recognition using interlaced derivative pattern for cloud based healthcare system," Cluster Computing (Springer), vol. 18, No. 2, pp. 795-802, June 2015. DOI: 10.1007/s10586-015-0439-7 [*ISI indexed*]
39. **Ghulam Muhammad**, "Date fruits classification using texture descriptors and shape-size features," Engineering Applications of Artificial Intelligence, vol. 37, pp. 361-367, 2015. DOI: 10.1016/j.engappai.2014.10.001 [*ISI indexed*]
38. A. Alelaiwi, A. Alghamdi, M. Shorfuzzaman, M. Rawashdeh, M. Shamim Hossain, and **Ghulam Muhammad**, "Enhanced engineering education using smart class environment," Computers and Human Behavior, vol. 51, pp. 852-856, 2015. DOI: 10.1016/j.chb.2014.11.061. [*ISI indexed*]
37. **Ghulam Muhammad**, M. Masud, A. Alelaiwi, M. A. Rahman, A. Karime, A. Alamri, M. Shamim Hossain, "Spectro-temporal directional derivative based automatic speech recognition for a serious game scenario," Multimedia Tools and Applications, vol. 74, issue 14, pp. 5313-5327, 2015. DOI: 10.1007/s11042-014-1973-7. [*ISI indexed*]

2014

36. Atif Alamri, **Ghulam Muhammad**, Abdulhameed A. Al Elaiwi, Khalid N. Al-Mutib, and M. Shamim Hossain, "Media Content Adaptation Framework for Technology Enhanced Mobile e-Learning," Journal of Universal Computer Science, vol. 20, no. 15, pp. 2016-1023, December 2014. [*ISI indexed*]
35. Ihsan Ullah, Hatim Aboalsamh, Muhammad Hussain, **Ghulam Muhammad**, George Bebis, "Gender Classification from Facial Images Using Texture Descriptors," Journal of Internet Technology, Vol. 15 No. 5, pp. 801-812, September 2014. [*ISI indexed*]
34. **Ghulam Muhammad** and Moutasem Melhem, "Pathological Voice Detection and Binary Classification Using MPEG-7 Audio Features," Biomedical Signal Processing and Controls, 11 (2014), pp. 1 – 9, 2014. DOI: 10.1016/j.bspc.2014.02.001. [*ISI indexed*]
33. M. Shamim Hossain and **Ghulam Muhammad**, "Cloud-based Collaborative Media Service Framework for Health-Care," International Journal of Distributed Sensor Networks, Vol. 2014, Article ID 858712, 11 pages, 2014. DOI:10.1155/2014/858712,2014. [*ISI indexed*]

32. **Ghulam Muhammad**, Muneer H. Al-Hammadi, Muhammad Hussain, and George Bebis, "Image forgery detection using steerable pyramid transform and local binary pattern," *Machine Vision and Applications*, Vol. 25, pp. 985-995, 2014. DOI: 10.1007/s00138-013-0547-4. [*ISI indexed*]
31. Muhammad Hussain, Salabat Khan, **Ghulam Muhammad**, Iftikhar Ahmad, and George Bebis, "Effective Extraction of Gabor Features for False Positive Reduction and Mass Classification in Mammography," *Applied Mathematics & Information Sciences*, Vol. 8, No. 1L, pp. 397-412, April 2014. DOI: 10.12785/amis/081L50 [*ISI indexed*]
30. Maryam Jabery, George Bebis, Muhammad Hussain, and **Ghulam Muhammad**, "Accurate and robust localization of duplicated region in copy-move image forgery," *Machine Vision and Applications*, vol. 25, pp. 451-475, 2014. DOI: 10.1007/s00138-013-0522-0. [*ISI indexed*]
29. M. S. Hossain, Mehedi Masud, **Ghulam Muhammad**, Majdi Rawashdeh, and M. Mehedi Hassan, "Automated and user involved data synchronization in collaborative e-health environments," *Computers in Human Behavior*, Vol. 30, pp. 485-490, January 2014. DOI: 10.1016/j.chb.2013.06.019 [*ISI indexed*]
28. Hamid R. Abachi and **Ghulam Muhammad**, "The impact of M-learning technology on students and educators," *Computers in Human Behavior*, Vol. 30, pp. 491-496, January 2014. DOI: 10.1016/j.chb.2013.06.018 [*ISI indexed*]
27. 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*]

2013

26. Muhammad Hussain, I. Ullah, H. Aboalsamh, **Ghulam Muhammad**, George Bebis, and Anwar Mirza, "Gender Recognition from Face Images with Dyadic Wavelet Transform and Local Binary Pattern", *International Journal on Artificial Intelligence Tools*, Vol. 22, No. 6, 1360018 (18 pages), 2013. DOI: 10.1142/S021821301360018X [*ISI indexed*]
25. Shicay Yang, George Bebis, Muhammad Hussain, **Ghulam Muhammad**, and Anwar M. Mirza, "Unsupervised discovery of visual face categories," *International Journal on Artificial Intelligence Tools*, Vol. 22, No. 1, 1250029 (30 pages), 2013. DOI: 10.1142/S0218213012500297 [*ISI indexed*]
24. Muhanad Jazzar and **Ghulam Muhammad**, "Feature Selection Based Verification/Identification System Using Fingerprints and Palm Print," *Arabian Journal of Science and Engineering*, Vol. 38, No. 4, pp. 849-857, 2013. [*ISI indexed*]
23. **Ghulam Muhammad** and Muhammad Hussain, "Passive Detection of Copy-Move Image Forgery using Undecimated Wavelets and Zernike Moments," *Information Journal*, Vol.16, No.5, pp. 2957-2964, May 2013.
22. Mohamed I. Alkanhal, **Ghulam Muhammad**, and Mohammed A. Al-Manie, "Face recognition using nonlinear correlation filter," *Information Journal*, Vol.16, No.6(B), pp. 4151-4164, June 2013.

21. 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.

2012

20. **Ghulam Muhammad**, Muhammad Hussain, Fatimah Alenezy, George Bebis, Anwar M. Mirza, and Hatim Aboalsamh, "Race classification from face images using local descriptors," International Journal on Artificial Intelligence Tools, Vol. 21, No. 5, 2012. DOI: 10.1142/S0218213012500194 [*ISI indexed*]
19. **Ghulam Muhammad**, Muhammad Hussain, and George Bebis, "Passive copy move image forgery detection using undecimated dyadic wavelet transform," Digital Investigation, Elsevier, vol.9, issue 1, pp. 49-57, 2012. DOI: 10.1016/j.diin.2012.04.004 [*ISI indexed*]
18. **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, Vol. 26, No. 6, pp. 817.e19-817.e27, 2012. DOI: 10.1016/j.jvoice.2012.05.002 [*ISI Indexed*]
17. Hesham A. Al-Twaijry, Mejahed C. Mekhallalati, Hamid R. Abachi, and **Ghulam Muhammad**, "A Rubrics based Quality Improvement Methodology for ABET accreditation," International Journal of Engineering Education, Vol. 28, No. 6, pp. 1266–1273, 2012. [*ISI indexed*]

2011

16. Foyzul Hassan, M. R. A. Kotwal, **Ghulam Muhammad**, M. N. Huda, "MLN-based Bangla ASR using context sensitive triphone HMM," Int. J. Speech Technol., Springer, DOI 10.1007/s10772-011-9095-3, June 2011.
15. **Ghulam Muhammad** and Khalid Alghathbar, "Environment recognition for digital audio forensics using mpeg-7 and Mel cepstral features," Journal of Electrical Engineering, Vol. 62, No. 4, pp.199–205, August 2011. [*ISI indexed*]
14. M. R. A. Kotwal, Fouzul Hassan, **Ghulam Muhammad**, and M.N. Huda, "Tandem MLNs based Phonetic Feature Extraction," International Journal of Computer Information Systems and Industrial Management Applications, Volume 3, pp.088-095, 2011.
13. **Ghulam Muhammad**, Tamer A Mesallam, Khalid H Malki, Mohamed Farahat, Mansour Alsulaiman and Manal Bukhari, "Formant analysis in dysphonic patients and automatic Arabic digit speech recognition," BioMedical Engineering OnLine 2011, 10:41. (doi:10.1186/1475-925X-10-41). [*ISI indexed*]
12. **Ghulam Muhammad**, "Extended Average Magnitude Difference Function (EAMDF) Based Pitch Detection", International Arab Journal on Information Technology (IAJIT), vol. 8, no. 2, pp. 222-228, April 2011. [*ISI indexed*]

11. Foyzul Hassan, Mohammed Rokibul Alam Kotwal, Mohammad Mahedi Hasan, **Muhammad Ghulam**, Mohammad Nurul Huda, "Inhibition/Enhancement Network Based ASR using Multiple DPF Extractors," Journal of Multimedia 6(5), pp. 395-403, 2011.

2010

10. Mansour Alsulaiman, Youssef Alotaibi, **Muhammad Ghulam**, Mohamed A. Bencherif and Awais Mahmood, "Arabic Speaker Recognition: Babylon Levantine Subset Case Study", Journal of Computer Science 6 (4): 381-385, 2010.
09. **Ghulam Muhammad**, "Noise-Robust Pitch Detection using Auto-correlation Function with Enhancements," Journal of King Saud University (CCIS section), vol. 22 (1), July 2010.
08. Yousef A. Alotaibi and **Ghulam Muhammad**, "Study on pharyngeal and uvular consonants in foreign accented Arabic for ASR," Computer Speech and Language, Elsevier Science, vol. 24, pp. 219-231, 2010. [*ISI indexed*]
07. Mohammad Nurul Huda, Manoj Banik, **Ghulam Muhammad**, Mashud Kabir, and Bernd J. Kroger, "Effects of Syllable Language Model on Distinctive Phonetic Features (DPFs) based Phoneme Recognition Performance," Journal of Multimedia, Vol. 5, No. 6, pp. 543-550, 2010.

2009

06. **Ghulam Muhammad**, "Acoustic quality normalization for robust automatic speech recognition," Int. J. Speech Technol., Springer, doi: 10.1007/s10772-009-9024-x, pp. 175-182, 2009.
05. K. Abdullah-Al-Mamun, F. Sarker, and **Ghulam Muhammad**, "A high resolution pitch detection algorithm based on AMDF and ACF," Journal of Scientific Research, 1(3), pp.508-515, DOI:10.3329/jsr.vli3.xxxx, 2009.

2008 and before

04. Mohammad Nurul Huda, **Muhammad Ghulam**, Takashi Fukuda, Kouichi Katsurada, and Tsuneo Nitta, "Canonicalization of Feature Parameters for Robust Speech Recognition Based on Distinctive Phonetic Feature (DPF) Vectors," IEICE Trans. Inf. & Syst., vol. E91-D, no. 3, pp. 488-498, March, 2008. [*ISI indexed*]
03. **Muhammad Ghulam**, Junsei Horikawa, Kouichi Katsurada, and Tsuneo Nitta, "A pitch-synchronous peak-amplitude (PS-PA) based feature extraction method for noise robust ASR," IEICE Trans. Inf. & Syst., vol. E89-D, no.11, pp. 2766-2774, November 2006. [*ISI indexed*]
02. **Muhammad Ghulam**, Takashi Fukuda, Kouichi Katsurada, Junsei Horikawa, and Tsuneo Nitta, "PS-ZCPA based features extraction with auditory masking, modulation enhancement and noise reduction for robust ASR," IEICE Trans. Inf. & Syst., vol. E89-D, no.3, pp.1015-1023, March 2006. [*ISI indexed*]
01. **Muhammad Ghulam**, Takaharu Sato, Takashi Fukuda, and Tsuneo Nitta, "Confidence scoring for accurate HMM-based speech recognition by using monophone-level normalization

based on subspace method,” IEICE Trans. Inf. & Syst., vol. E86-D, no.3, pp.430-437, March 2003. [ISI indexed]

International Conference Publications

2017

98. 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, Riyadh, Saudi Arabia, 21-23 February 2017.

2016

97. Awny Alnusair, Majdi Rawashdeh, Mohammed F. Alhamid, M. Anwar Hossain, **Ghulam Muhammad**, “Reusing Software Libraries Using Semantic Graphs,” Proc. of the 17th IEEE International Conference on Information Reuse and Integration (IRI-2016), Pittsburgh, PA, USA, 28-30 July, 2016.

2015

96. Ahmed Al-nasheri, Zulfiqar Ali, **Ghulam Muhammad** and Mansour Alsulaiman, "An Investigation of MDVP Parameters for Voice Pathology Detection on Three Different Databases," Proc. Interspeech'15, pp. 2952-2956, Dresden, Germany, 6-10 September, 2015.
95. Muhammad Hussain, Saeed Bamatraf, Hatim Aboalsamh, Aamir Saeed Malik, Hafeez Ullah Amin, Hassan Mathkour, **Ghulam Muhammad**, and Emad-Ul-Haq Qazi, “A System based on 3D and 2D Educational Contents for True and False Memory Prediction using EEG Signals,” 7th International IEEE/EMBS Conference on Neural Engineering (NER), Montpellier, France, April 22-24, 2015.
94. M. Shamim Hossain and **Ghulam Muhammad**, "Cloud-Assisted Framework for Health Monitoring," the 28th annual IEEE Canadian Conference on Electrical and Computer Engineering (CCECE'2015), Halifax, Nova Scotia, Canada, 3-6 May, 2015.
93. Ahmed Al-nasheri, Zulfiqar Ali, **Ghulam Muhammad**, Mansour Alsulaiman, Khalid Almalki, Tamer Mesallam, and Mohamed Farahat, "Voice Pathology Detection with MDVP Parameters Using Arabic Voice Pathology Database," The 5th National Symposium on Information Technology: Towards New Smart World (NSITNSW'2015), Riyadh, Saudi Arabia, 17-19 February, 2015.

2014

92. Muhammad Hussain, Sarah Al-Otaibi, Hatim Aboalsamh, George Bebis, and **Ghulam Muhammad**, “Nonsampled Contourlet Transform Based Descriptors for Gender Recognition,” 2014 11th International Conference on Computer Graphics, Imaging and Visualization, pp. 63-68, Singapore, August 06-08, 2014.
91. **Ghulam Muhammad**, “Automatic Date Fruit Classification By Using Local Texture Descriptors And Shape-Size Features,” 8th European Modelling Symposium (EMS2014), Pisa, Italy, October 21-23, 2014.

90. **Ghulam Muhammad**, Mansour Alsulaiman, Awais Mahmood, Malak Almojaly, and M.A. Bencherif, "Voice Pathology Detection using Multiresolution Technique," 8th European Modelling Symposium (EMS2014), Pisa, Italy, October 21-23, 2014.
89. Malak Almojaly, **Ghulam Muhammad**, and Mansour Alsulaiman, "Detection and Classification of Voice Pathology Using Feature Selection," 11th ACS/IEEE International Conference on Computer Systems and Applications, Doha, Qatar, November 10-13, 2014.
88. Afnan Alhindi, Mansour Alsulaiman, **Ghulam Muhammad** and Saad Al-Kahtani, "Automatic Pronunciation Error Detection of Nonnative Arabic Speech," 11th ACS/IEEE International Conference on Computer Systems and Applications, Doha, Qatar, November 10-13, 2014.
87. Ahmed A-Nasheri, Zulfiqar Ali, **Ghulam Muhammad**, and Mansour Alsulaiman, "Voice Pathology Detection Using Auto-Correlation of Different Filters Bank," 11th ACS/IEEE International Conference on Computer Systems and Applications, Doha, Qatar, November 10-13, 2014.
86. Zulfiqar Ali, **Ghulam Muhammad**, Mansour Alsulaiman, Irraivan Elamvazuthi and Khalid Al-Mutib, "Automatic Speech Recognition for Dysphonic Patients by using Oriented Local Features," 27th International Conference on Computer Applications in Industry and Engineering, New Orleans, Louisiana, USA, October 13-15, 2014.
85. Mansour Alsulaiman, Zulfiqar Ali, **Ghulam Muhammad**, Afnan Al Hindi, Taha Alfakih, Hussein Obeidat, Saad Al-Kahtani, "Pronunciation Errors of Non-Arab Learners of Arabic Language," IEEE International Conference on Computer, Communication, and Control Technology (I4CT 2014), pp. 270-275, Langkawi, Malaysia, September 2-4, 2014.
84. **Ghulam Muhammad**, M. Solaiman Dewan, M. Moniruzzaman, Muhammad Hussain, and M. Nurul Huda, "Image forgery detection using Gabor filters and DCT," 2014 International Conference on Electrical Engineering and Information Communication Technology (ICEEICT), Dhaka, Bangladesh, 10-12 April, 2014.
83. Muhammad Hussain, Sahar Q. Saleh, **Ghulam Muhammad**, Hatim Aboalsamh, and George Bebis, "Comparison between WLD and LBP Descriptors for Non-Intrusive Image Forgery Detection," 2014 IEEE International Symposium on INnovations in Intelligent SysTems and Applications (INISTA), Alberobello, Italy, June 23-25, 2014.
82. **Ghulam Muhammad**, Zulfiqar Ali, Mansour Alsulaiman, and Khalid Almutib, "Vocal Fold Disorder Detection by applying LBP Operator on Dysphonic Speech Signal," The 2nd International Conference on Intelligent Control, Modelling and Systems Engineering, Boston, USA, January 2014.

2013

81. Amani A. Alahmadi, Muhammad Hussain, Hatim Aboalsamh, **Ghulam Muhammad**, George Bebis, "Splicing image forgery detection based on DCT and local binary pattern," 1st IEEE Global Conf. on Signal and Information Processing (GlobalSIP), Austin, Texas, USA, December 2013.

80. **Ghulam Muhammad**, “Voice pathology detection using vocal tract area,” European Modeling Symposium (EMS), Manchester, UK, November 2013.
79. Motasem AlSawadi, **Ghulam Muhammad**, Muhammad Hussain, and George Bebis, “Copy-move image forgery detection using local binary pattern and neighborhood clustering,” European Modeling Symposium (EMS), Manchester, UK, November 2013.
78. Zulfiqar Ali, Mansour Alsulaiman, Ghulam **Muhammad**, Irraivan Elamvazuthi, and Tamer Mesallam, “Vocal fold disorder detection based on continuous speech by using MFCC and GMM,” 7th IEEE – GCC Conference, Qatar, November 2013.
77. Awais Mahmood, Mansour Alsulaiman, **Ghulam Muhammad**, “MDLF-Mavg: A new speech feature with a voice print,” 7th IEEE – GCC Conference, Qatar, November 2013.
76. Mansour Alsulaiman, Zulfiqar Ali, **Ghulam Muhammad**, Mohamed Bencherif, and Awais Mahmood, “KSU Speech Database: Text Selection, Recording and Verification,” European Modeling Symposium (EMS), Manchester, UK, November 2013.
75. **Ghulam Muhammad** and Moutasem Melhem, “Voice Pathology Detection and Classification Using MPEG-7 Audio Low-Level Features,” Interspeech2013, pp. 3627 – 3631, Lyon, France, August 2013.
74. Muhammad Hussain, **Ghulam Muhammad**, Sahar Q. Saleh, Anwar M. Mirza, and George Bebis, “Image forgery detection using multi-resolution Weber local descriptors,” Eurocon2013, pp. 1570- 1577, Zagreb, Croatia, July 2013.
73. **Ghulam Muhammad**, Muneer H. Al-Hammadi, Muhammad Hussain, Anwar M. Mirza, and George Bebis, “Copy move image forgery detection method using steerable pyramid transform and texture descriptors,” Eurocon2013, pp. 1586- 1592, Zagreb, Croatia, July 2013.
72. **Ghulam Muhammad** and Moutasem Melhem, “MPEG-7 Audio Features based Voice Pathology Detection,” Eurocon2013, pp. 1617- 1624, Zagreb, Croatia, July 2013.
71. Taghreed Alamri, Muhammad Hussain, Hatim Aboalsamh, **Ghulam Muhammad**, George Bebis, and Anwar M. Mirza, “Category specific face recognition based on gender,” 2013 International Conference on Information Science and Applications (ICISA 2013), Pattaya, Thailand, June 2013.
70. Faten A. Alomar, **Ghulam Muhammad**, Hatim Aboalsamh, Muhammad Hussain, Anwar M. Mirza, and George Bebis, “Gender recognition from faces using bandlet and local binary patterns,” 20th International Conference on Systems, Signals and Image Processing (IWSSIP), pp. 59-62, Romania, July 2013.
69. Muneer H. Al-Hammadi, **Ghulam Muhammad**, Muhammad Hussain, and George Bebis, “Curvelet transform and local texture based image forgery detection,” International Symposium on Visual Computing (ISVC'13), Crete, Greece, July 29-31, 2013; G. Bebis *et al.* (Eds.): ISVC 2013, Part II, LNCS 8034, pp. 503–512, 2013.
68. Anwar M. Mirza, Muhammad Hussain, Huda Almuzaini, **Ghulam Muhammad**, Hatim Aboalsamh, and George Bebis, “Gender recognition using fusion of local and global facial

features,” International Symposium on Visual Computing (ISVC'13), Crete, Greece, July 29-31, 2013; G. Bebis *et al.* (Eds.): ISVC 2013, Part II, LNCS 8034, pp. 493–502, 2013.

67. Sahar Q. Saleh, Muhammad Hussain, **Ghulam Muhammad**, and George Bebis, “Evaluation of image forgery detection using multi-scale Weber local descriptors,” International Symposium on Visual Computing (ISVC'13), Crete, Greece, July 29-31, 2013; G. Bebis *et al.* (Eds.): ISVC 2013, Part II, LNCS 8034, pp. 416–424, 2013.
66. Muhammad Hussain, Sarah Al-Otaibi, **Ghulam Muhammad**, Anwar M. Mirza, Hatim Aboalsamh and George Bebis, “Gender Recognition using Nonsubsampled Contourlet Transform and WLD Descriptor,” 18th Scandinavian Conference on Image Analysis, Espoo, Finland, June 17-20, 2013; J.-K. Kämäräinen and M. Koskela (Eds.): SCIA 2013, LNCS 7944, pp. 373–383, 2013.
65. Maryam Jabeti, George Bebis, Muhammad Hussain, and **Ghulam Muhammad**, “Improving the Detection and Localization of Duplicated Regions in Copy-Move Image Forgery,” 18th International Conference on Digital Signal Processing (DSP2013), pp. 1-6, Santorini, Greece, July 2013.
64. **Ghulam Muhammad**, “Multi-scale local texture descriptor for image forgery detection,” IEEE International Conference on Industrial Technology (ICIT), pp. 1146-1151, Cape Town, South Africa, February 2013.

2012

63. Muhammad Hussain, **Ghulam Muhammad**, Sahar Q. Saleh, Anwar M. Mirza, and George Bebis, “Copy-Move Image Forgery Detection Using Multi-Resolution Weber Descriptors,” The 8th International Conference on Signal Image Technology & Internet Based Systems (SITIS), pp. 395-401, Sorrento-Naples, Italy, November 2012.
62. Muhammad Hussain, Salabat Khan, **Ghulam Muhammad**, and George Bebis, “A Comparison of Different Gabor Features for Mass Classification in Mammography,” The 8th International Conference on Signal Image Technology & Internet Based Systems (SITIS), pp. 142-148, Sorrento-Naples, Italy, November 2012.
61. Muhammad Hussain, **Ghulam Muhammad**, and George Bebis, “Face Recognition Using Multiscale and Spatially Enhanced Weber Law Descriptor,” The 8th International Conference on Signal Image Technology & Internet Based Systems (SITIS), pp. 85-89, Sorrento-Naples, Italy, November 2012.
60. Mohamed Alkanhal and **Ghulam Muhammad**, “Polynomial Correlation Filters for Human Face Recognition,” The 11th IEEE International Conference on Machine Learning Applications (ICMLA 2012), Florida, December 2012.
59. Mohamed Alkanhal, **Ghulam Muhammad**, Adel Alotaibi, and Khalid Alqahtani, “A robust face recognition system for partially occluded faces,” 27th International Conference Image and Vision Computing (IVCNZ 2012), New Zealand, November 2012.
58. Mohamed A. Bencherif, Mansour Alsulaiman, **Ghulam Muhammad**, Zulfiqar Ali, Awais Mahmood, and Mohamed Faisal, “Gender effect in trait recognition,” Proc. World Congress on Engineering and Computer Science (WCECS 2012), Vol. I, San Francisco, USA, October 2012.

57. Ihsan Ullah, Hatim Aboalsamh, Muhammad Hussain, **Ghulam Muhammad**, Anwar M. Mirza, and George Bebis, "Gender Recognition from facial images with local LBP," International Conference on Signals and Electronics Systems, Wroclaw, Poland, September 2012.
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 (ICCV'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 $\Delta\Delta$ 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 $\Delta\Delta$ 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 $\Delta\Delta$ 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 (ISCST '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 (ICCV'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:

- Best teaching faculty award for Computer Engineering department (2014-2015).
- 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.

Research Projects and Grants:

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 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 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 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 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 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 canonicalization 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, Member. (91229298)
- Institute of Engineers, Bangladesh (IEB), Member. (M-22272)
- ACM, Member. (5060427)

Professional Activities:

Editorial Board member / Technical Committee Member / Program Committee Member

- Associate Editor, KSU CCIS Journal (Elsevier), 2016 - present
- International Arab Journal on Information Technology, 2011 – present

- 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 5th 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 4th 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.

Reviewer (journal)

- International Arab Journal on Information Technology
- Multimedia Tools and Applications, Springer
- Biomedical Signal Processing and Control, Elsevier
- Computer Vision and Image Understanding, Elsevier
- Digital Signal Processing, Elsevier
- Information Fusion, Elsevier
- Information Sciences, Elsevier
- Computers in Biology and Medicine, Elsevier
- IEEE Journal of Biomedical and Health Informatics
- International Journal on Speech Technology, Springer
- IET Image Processing
- IET Signal Processing
- IEEE Transactions on Information Forensics & Security

- Computer and Electrical Engineering, Elsevier
- IEEE Access

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>