



# Muhammad Sajjad

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**Permanent Address:** Resident Warden II, Hardinge Hostel Islamia College, Peshawar, Pakistan.

## Personal Details

**Name:** Muhammad Sajjad  
**Date of Birth:** 13<sup>th</sup> Feb 1982  
**Gender:** Male  
**Marital Status:** Married

## Education

**2012-2014**  
PhD (Digital Contents /Computer Science)  
Sejong University, Seoul, Republic of Korea

**2005- 2007**  
MS (Computer Software Engineering)  
National University of Sciences and Technology, Pakistan (NUST). (**CGPA: 3.15/4.0**)

**2003 – 2005**  
M.Sc (Computer Science)  
University of Peshawar, Pakistan. (**Percentage: 75.92**)

**2001 – 2003**  
B.Sc (Computer Science)  
University of Peshawar, Pakistan. (**Percentage: 77.45**)

## Professional Experience

**2008-2009**  
Lecturer in Dept. of Computer Science, University of Peshawar, Pakistan.

**2009-2010**  
Lecturer in Dept. of Computer Science, University of Science & technology Bannu, Pakistan.

**2010-Till Now**  
Lecturer in Dept. of Computer Science, Islamia College Peshawar (Chartered University), Pakistan.

## AREA OF INTEREST

Digital Image Processing, Video Processing, Computer Vision, Medical Imaging, Machine Learning.

## THESIS

**PhD Thesis Title:** Image Super-Resolution Reconstruction using Adaptive Interpolation and Sparse Representation Based Methods

**MS Thesis Title:** Image Magnification using Adaptive Interpolation by Pixel Level Data-Dependent Geometrical Shapes

## TEACHING AND SUPERVISION

### Courses Taught

Digital Image Processing (using Matlab as a simulation tool ), Operating Systems, Distributed Computing, Assembly Language, Data Structures and Algorithms, Advance Computer Programming (OOP C++ & Java)

### Master Projects Co-Supervision

- Remotely supervise and guide PhD and Master students in various tasks at Intelligent Media Lab (where, I was working as a PhD researcher)
- Supervise PhD and Master students in research work at my home department of Computer science, Islamia College Peshawar, Pakistan.
- Remotely assist my professor in various tasks e.g. project proposal writing etc.

### Team Work

- Play an active role for capacity building in Dept. of Comp. Science Islamia College Peshawar.
- Project coordinator (responsibilities include research proposal evaluation, reviewing research articles, thesis evaluation) at Dept. of Comp. Science Islamia College Peshawar.
- Work with Lab members (PhD fellows) on collaboration basis on various research ideas and achieved magnificent outputs.
- Assist Faculty at Dept. of Comp. Science Islamia College Peshawar in research ability and aptitude building

## SERVICES

### Reviewer

- Journal of Signal Processing: Image Communication
- Journal of Visual Communication and Image Representation

- Journal of Signal, Image and Video
- Future Generation Computer Systems
- Multimedia Tools and Applications
- ACM Transactions on Embedded Computing Systems
- Enterprise Information Systems

### Departmental and University

- Coordinator of quality evaluation cell for undergraduate projects
- Coordinator of International Students in Intelligent Media Lab
- Advisor to Dean for Redesigning Curricula of UG Courses

## PUBLICATIONS

### Submitted Publications

1. **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik, *Image Super-Resolution using Orthogonal Complementary Matching Pursuit over Single Redundant Dictionary Based on Sparse Deep Belief Net Model*.
2. Jamil Ahmed, **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik, *Salient weighted feature graph for image retrieval on GPU*.
3. Khan Muhammad, **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik, *Video Summarization and its Secure Transmission using Cryptography*, Patent, KIPRIS(Korea Intellectual Property Rights Information Service).
4. Three more are under review, detail can be provided on demand.
5. Work (coding, experimenting, and writing ) is in progress on four more ideas consisting of *WBC classification, brain tumor 3D visualization, official documents and Medical imaging protection and verification*, and *optic-desk segmentation* in Digital Image Processing Lab

### Peer Reviewed Journals

1. **Muhammad Sajjad**, Khan Muhammad, Zahoor Jan, S. Rho, Irfan Mehmood *Mobile-Cloud Assisted Framework for Selective Encryption of Medical Images with Steganography for Resource-Constrained Devices*, **accepted** in Multimedia Tools and Applications, (2016) **[SCI/SCIE](IF=1.346)**.
2. Khan Muhammad, Jamil Ahmad, **Muhammad Sajjad**, Sung Wook Baik *Visual Saliency Models for Summarization of Diagnostic Hysteroscopy Videos* **accepted** in Springer Plus (2016) **[SCI/SCIE](IF=0.9)**.
3. Khan Muhammad, **Muhammad Sajjad**, Sung Wook Baik, *Efficient Visual Attention Driven Framework for Key frames Extraction from Hysteroscopy Videos*, **accepted** in Biomedical Signal Processing and Control, (2016) **[SCI/SCIE](IF=1.521)**.
4. Jamil Ahmad, **Muhammad Sajjad**, I. Mehmood, · S. Rho, · S. W. Baikd, *Saliency-weighted graphs for efficient visual content description and their applications in real-time image retrieval systems*, Journal Of Real-Time Image Processing, (2015) DOI: 10.1007/s11554-015-0536-0 **[SCI/SCIE](IF=2.02)**.
5. **Muhammad Sajjad**, Irfan Mehmood, Naveed Abbas, Sung Wook Baik, *BPD based image superresolution using a redundant set of atoms*, Signal, Image and Video Processing, vol. 10 Issue. 1 (2016) 181–188 **[SCI/SCIE](IF=1.430)**.
6. Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik, *Divide-and-conquer based Summarization Framework to Extract Affective Video Contents*, Neurocomputing, vol. 174, Issue. Part-A (2016) Pages 393-403 **[SCI/SCIE](IF=2.083)**.
7. Khan Muhammad, Jamil Ahmad, **Muhammad Sajjad**, Muhammad Zubair, "Secure Image Steganography using Cryptography and Image Transposition." *NED University Journal of Research* 12.4 (2015): 81-91.

8. **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik, *Sparse coded image super-resolution using K-SVD trained dictionary based on regularized orthogonal matching pursuit*, Bio-Medical Materials and Engineering, 26 (2015) S1399–S1407 [**SCI/SCIE**](**IF=1.091**)
9. Khan Muhammad, Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik, *Novel magic LSB substitution method (M-LSB-SM) using multi-level encryption and achromatic component of an image*, Multimedia Tools and Applications, (2015): 1-27. (DOI: 10.1007/s11042-015-2671-9) [**SCI/SCIE**](**IF=1.346**).
10. **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik, *Image Super-Resolution using Sparse Coding over Redundant Dictionary based on Effective Image Representations*, Journal of Visual Communication & Image Representation, , January 2015, Volume 26, Issue 3, Pages 50-65, [**SCI/SCIE**] (**IF=1.361**).
11. Jamil Ahmad, **Muhammad Sajjad**, Irfan Mehmood, Seungmin Rho, Sung Wook Baik. "Saliency-weighted graphs for efficient visual content description and their applications in real-time image retrieval systems." *Journal of Real-Time Image Processing*: 1-17. (DOI: 10.1007/s11554-015-0536-0) (2015) [**SCI/SCIE**] (IF=2.020)
12. Irfan Mehmood, Muhammad Sajjad, Sung Wook Baik, *Mobile-Cloud Assisted Video Summarization Driven Framework for Efficient Management of Remote Sensing Data Generated by Wireless Capsule Sensor*, Sensors 14.9 (2014)17112-17145 [**SCI/SCIE**](**IF=2.245**).
13. Irfan Mehmood, **Muhammad Sajjad**, Waleed Ejaz, Sung Wook Baik, *Saliency-directed prioritization of visual data in wireless surveillance networks*, Information Fusion, July 2015, Volume 24, Pages 16–30 [**SCI/SCIE**] (**IF=3.681**).
14. Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik, *Video summarization based tele-endoscopy: a service to efficiently manage visual data generated during wireless capsule endoscopy procedure*, Journal of medical systems 38.9 (2014): 1-9 [**SCI/SCIE**](**IF=1.783**).
15. **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik, *Sparse Representations-Based Super-Resolution of Key-Frames Extracted from Frames-Sequences Generated by a Visual Sensor Network*. Sensors 14.2 (2014): 3652-3674[**SCI/SCIE**](**IF=2.245**).
16. Jamil Ahmad, **Muhammad Sajjad**, Irfan Mehmood, Seungmin Rho, Sung Wook Baik. "Describing Colors, Textures and Shapes for Content Based Image Retrieval-A Survey." *Journal of Platform Technology*: 2.4 (2014):34-48.
17. **Muhammad Sajjad**, Naveed Ejaz, Irfan Mehmood, Sung Wook Baik, *Digital image super-resolution using adaptive interpolation based on Gaussian function*, Multimedia Tools and Applications (2013): 1-17[**SCI/SCIE**](**IF=1.346**).
18. Naveed Ejaz, Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik *Video Summarization by Employing Visual Saliency in a Sufficient Content Change Method*, International Journal of Computer Theory & Engineering 6.1 (2014).
19. Irfan Mehmood, Naveed Ejaz, **Muhammad Sajjad**, Sung Wook Baik *Prioritization of brain MRI volumes using medical image perception model and tumor region segmentation*, Computers In Biology and Medicine 43.10 (2013): 1471-1483[**SCI/SCIE**](**IF=1.475**).
20. **Muhammad Sajjad** et al., *Agent-Mediator based Communication Framework for Adaptive Mixed Reality Space*, Journal of the Korea Institute of Next Generation Computing, 9.4 (2013) 35-48.
21. **Muhammad Sajjad**, Naveed Ejaz, Sung Wook Baik, *Multi-kernel based adaptive interpolation for image super-resolution*, Multimedia Tools and Applications 72.2 (2014): 2063-2085[**SCI/SCIE**](**IF=1.346**).
22. **Muhammad Sajjad**, Naveed Khattak, Noman Jafri. *Image magnification using adaptive interpolation by pixel level data-dependent geometrical shapes*, International Journal of Computer Science and Engineering 1.2 (2007): 118-127. (**16 other citations**)

#### Conference Papers

1. Jamil Ahmad, **Muhammad Sajjad**, Irfan Mehmood, Sung Wook Baik. "SSH: Salient Structures Histogram for Content Based Image Retrieval." *Network-Based Information Systems (NBIS), 2015 18th International Conference on. IEEE, 2015.*

2. Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik, *Audio-visual and EEG-based Attention Modeling for Extraction of Affective Video Content*, (PlatCon 2015, Jeju island, Korea., January 26-28, 2015)
3. Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik, *Visual attention based extraction of semantic keyframes*, CSCC2014, Santorini Island, Greece, Vol. 1 (2014).
4. Irfan Mehmood, **Muhammad Sajjad**, Sung Wook Baik, *Saliency-directed Multi-dimensional Dictionary Learning for MR Image Denoising*, accepted in ICGHIT 2014(2014).
5. Muhammad Azhar, Fahad, **Muhammad Sajjad**, Sung Wook Baik, *Flowchart Based Storyboard System for Authoring Visual Contents in Mixed Reality Space*, ICEEE 2014, 3.3 (2014)
6. Muhammad Azhar, Fahad, **Muhammad Sajjad**, Sung Wook Baik, *VIP-Emulator: To Design Interactive Architecture for adaptive mixed Reality Space*, ICDMCME 2014, (2014)
7. Fahad, Muhammad Azhar, **Muhammad Sajjad**, Sung Wook Baik, *Real Time Distributed Content Rendering Technique based on Agent-mediator Communication Framework for Multi-display Systems*, in Proc. of 2013 International Conference on Future Software Engineering and Multimedia Engineering (ICFM 2013), IERI Procedia, vol. 6 pp. 2-7, Saipan, USA, December 28-29 2013
8. Fahad, Muhammad Azhar, **Muhammad Sajjad**, Sung Wook Baik, *Comparative Analysis of Graphic Contents Rendering Techniques in a Multi-view System through Agent-Mediator Based Communication*, in Proc. of Ubiquitous Information Technologies and Applications (CUTE 2013) Volume 280, 2014, pp 573-579, Danang, Vietnam, December 18-20 2013
9. **Muhammad Sajjad et. al**, *Synchronized and efficient communication system based on Agent-Mediator framework for adaptive mixed reality space*, ICT for Smart Society (ICISS), 2013 International Conference on , 2013, vol., no., pp.1,4, 13-14.
10. **Muhammad Sajjad**, Ran Baik, Sung Wook Bai, *Digital Image Magnification Using Gaussian-Edge Directed Interpolation*, IT Convergence and Security 2012. Lecture Notes in Electrical Engineering Vol. 215, 2013, pp 545-552.

## SKILLS

Team management and coordination skills, Problem solving skills, Fluent in English, Excellent computer skills

## LANGUAGES

MATLAB, C/C++, OOP C++, Assembly, Advance Java.

**Google Scholar Link:** <https://scholar.google.com.pk/citations?user=E4-dEIIAAAJ&hl=en>

**ResearchGate Link:** [https://www.researchgate.net/profile/Muhammad\\_Sajjad6](https://www.researchgate.net/profile/Muhammad_Sajjad6)

## REFERENCES

### Professor Sung Wook Baik

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### Dr. Seungmin Rho

Assistant Professor,  
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**Brief Biography:** Muhammad Sajjad received his MS degree in Computer Software Engineering in 2008 from National University of Sciences and Technology, Pakistan. From 2008 to 2012, he served as a lecturer in different renowned universities of Khyber Pakhtunkhwa, Pakistan, where he provided additional duties other than teaching such as project coordinator and supervising research activities of BS and MS students. In 2012, he joined Intelligent Media Lab (IM Lab) as a research associate while enrolling as a PhD student in Sejong University, Seoul, South Korea. In IM Lab, he worked on various projects related to image super-resolution, image quality assessment, video summarization and prioritization, and mixed reality. He also assisted his professor while writing research project proposal, supervising MS and newly inducted PhD students, and various other tasks related to teaching and management. After completing his PhD in 2015, he joined back his home university, Islamia College Peshawar (Public Sector University). Currently, he is working as an assistant professor in computer science department, Islamia College Peshawar. He is also the leading researcher of digital image processing lab in computer science department, where many BS, MS, and PhD students are working on various projects such image/video retrieval, steganography, digital watermarking, and medical imaging analysis etc. under his supervision. In addition, he is also in charge of quality enhancement cell, playing an active role in capacity building, improving teaching quality, and enhancing academia. Moreover, he is in strong research collaboration with IM lab where he assist his professor (supervisor), remotely supervising and guiding PhD and Master students in various tasks such as proposing new ideas, giving his valuable suggestions during experiments, and providing support in writing and revising project proposals and research papers.

He has published 40+ papers in peer-reviewed international journals and conferences such as Information Fusion, Neurocomputing, Sensors, Journal of Visual Communication and Image Representation, Multimedia Tools and Applications, Computers in Biology and Medicine, Journal of Medical Systems, Signal, Image and Video Processing, Bio-Medical Materials and Engineering, KSII Transactions on Internet and Information Systems, NBIS 2015, MITA 2015, and PlatCon 2016. He is serving as a professional reviewer for numerous well-reputed journals such as Journal of Visual Communication and Image Representation (11), Future Generation Computer Systems (4), Journal of SuperComputing (2), Signal Image and Video Processing (5), Multimedia Tools and Applications (5), ACM Transactions on Embedded Computing Systems (5), and Enterprise Information Systems (3).