

Engr. Dr. Shehzad Khalid

Address:

Dept. of C&SE, Bahria University
Shangrila Road, E-8, Islamabad, Pakistan.
Tel.: 0092-51-9260002 (Ext: 315), Mob. 0092-300-5102999
Email: shehzad_khalid@hotmail.com;shehzad@bahria.edu.pk

Education: **University of Manchester, UK.**

Ph.D. in Motion Data Mining and Machine Learning, February 2009.
Title of the thesis is "Motion Classification Using Spatiotemporal Approximation of Object Trajectories".

National University of Science and Technology, Rawalpindi, Pakistan.

MSc Software Engineering, July 2003.
CGPA: 4.0/4.0

GIK Institute of Engineering Sciences & Technology Topi, Pakistan.

Bachelor of Science in Computer Systems Engineering, Graduated in May 2000
CGPA: 3.31/4.0

Islamabad Model College For Boys ,F-8/4 Islamabad Pakistan.

F.Sc. (Engineering), 1996
Marks: 83%

Islamabad Model College For Boys, F-8/4 Islamabad Pakistan.

Matric (Sciences), 1994
Marks: 84%

Experience: **Bahria University, Islamabad.**

- Working as Associate Professor since August 2007.
- Head of Computer Vision and Pattern Recognition Research Center

National Database and Registration Authority (NADRA)

Worked as senior software engineer from November 2005 to September 2007.

HORNET, University of Manchester.

Worked as network administrator in University Hall of Residence from September 2004 to August 2005.

University of Manchester, UK.

Worked as teaching assistant for Java and Computer Graphic undergraduate courses, from September 2003 to May 2005.

Bahria Institute of Management and Computer Sciences, Bahria University, Islamabad.

Taught Object Oriented Programming and Java as a lecturer in 2002.

aQuad Consultings:

Worked in aQuad consultings, worked on JAVA, JSPs, EJBs and web development from August 15th, 2000 to June 20th, 2002.

SIEMENS Internee, *Summer 99*

Worked on the exchange (EWSN) which serves as a router to establish communication between the subscriber attached to the exchange and also to other exchanges and gateways.

Project: **Biometric Access Control System (BACS)**

Designed and developed a biometric based access control system. BACS is a sophisticated combination of card swipe, fingerprint and facial matching.

Vehicle Identification and Tracking System (VITS)

Developed a state-of-the-art Vehicle Identification and Tracking System based on leading RFID technology. VITS help control vehicle related crimes including car thefts, through centrally controlled tracker chip, fixed on each vehicle, known as Vehicle Identification Number (VIN).

Vehicle Access Control System (VACS)

Developed VACS for access control of vehicles to different premises with restricted access. The system is implemented using leading RFID technology, loops for motion

detection and digital cameras. The system is centralized for controlling access to different premises using single tracker chip.

Human Motion Data Mining

Research on techniques for automating of surveillance systems. Developed a tracking system to track multiple objects in a single camera environment. Indexing and querying system is developed for indexing motion data and query based retrieval of motion clips based on indexed information. Methodology for classification and prediction of motion trajectories using spatiotemporal approximation is proposed and tested. Event detection based on motion behavior of objects in video is also studied.

Etilize

Worked on a project developed for efficient handling of resources of different companies that are registered to the site. Etilize can handle transactions like buy, sell, temporary and permanent swaps of goods. It also have the capability to efficiently handle the liquid resources of companies. It works for R-R, M-M, B-B and B-C models. You can visit the site at <http://www.r2rcentral.com>.

EtilizeSCX

Working on a project SCX (Sales Collaborate Xchange) which is a B2B n tier project. Using the site, users can browse through different products and can add them into their shopping cart for which they can then order to buy. The order is then submitted to appropriate vendors and the users are then provided with the order tracking facilities till the order is delivered to them.

Human Motion Capture and 3D rendering of the Human model

A software based motion caption and rendering in the OpenGL environment used in entertainment, ads, games and movie.

Book:

1. Shehzad Khalid, "*Motion Data Mining and Activity Recognition*", VDM Verlag, 2009, ISBN 978-3-639-21045-3.

Book Chapter:

1. Shehzad Khalid, "*Behavior recognition using any feature space representation of motion trajectories*", In book "Video Surveillance", Intech, 2011, ISBN 978-953-307-958-5.
2. Usman Akram, Shehzad Khalid, "A software system for grading diabetic retinopathy by analyzing retinal images", In book "Knowledge based processes in software development", IGI Global, 2012.

Publications:

1. Andrew Naftel and Shehzad Khalid, "*Video Sequence Indexing Through Recovery of Object Based Motion Trajectories*", Irish Machine Vision and Image Processing Conference, 232-239, Trinity College, Dublin, Sep 1-3, 2004.
2. Naftel and S. Khalid, "*Indexing and Retrieval of Video Clips via Object Motion Trajectory Descriptors*", Visualization, Imaging and Image Processing, 452-141, Sep 6-8, 2004, Marbella, Spain.
3. S. Khalid and A. Naftel, "*Evaluation of Matching Metrics for Trajectories-based Indexing and Retrieval of Video Clips*", IEEE workshop on Applications of Computer Vision, Jan 5-7 2005, Colorado, U.S.A.
4. Shehzad Khalid and Andrew Naftel, "*Motion Trajectory Clustering for Video Retrieval Using Spatiotemporal Approximation*", 8th International Conference on Visual Surveillance Systems, July 4, 2005, Amsterdam, Holland.
5. Shehzad Khalid and Andrew Naftel, "*Motion Clustering Using Spatiotemporal Approximation*" IASTED international conference on Internet and Multimedia Systems and Applications, August 15-17, 2005, Honolulu, Hawaii, U.S.A.
6. Andrew Naftel and Shehzad Khalid, "*Classification and Prediction of Motion Trajectories Using Spatiotemporal Approximation*", BMVC workshop on Human Activity Recognition and Modelling, 9th Sep, 2005, Oxford, U.K.

7. Shehzad Khalid and Andrew Naftel, "Classifying Spatiotemporal Object Trajectories using Unsupervised Learning of Basis Function Coefficients", 3rd ACM International Workshop on Video Surveillance and Sensor Networks, Nov. 11-12, 2005, Singapore.
8. Shehzad Khalid and Andrew Naftel, "Detecting Anomalous Motion Trajectories in the Coefficient Space", IEEE International Conference on Computer Vision Systems, Jan 5-7, 2006, New York, U.S.A.
9. Shehzad Khalid and Andrew Naftel, "Classifying spatiotemporal object trajectories using unsupervised learning in the coefficient feature space", *ACM Multimedia Systems Special Issue: Multimedia video surveillance*, Vol. 12, No. 3, pp. 227-238, December 2006.
10. Shehzad Khalid and Andrew Naftel, "Automatic motion learning in the presence of anomalies using coefficient feature space representation of trajectories", *Acta Automatica Sinica*, Vol. 36, No 5, January, 2010.
11. Shehzad Khalid and Andrew Naftel, "Self-Tuned Unsupervised Learning of Motion Trajectories", Vol. 2, No. 1, pp. 27-36, August 2009.
12. Shehzad Khalid, "Motion based behaviour learning, profiling and classification in the presence on anomalies", *Pattern Recognition*, Vol. 43, No. 1, pp. 173-186, 2010.
13. Shehzad Khalid, "Activity classification and anomaly detection using m-Medioids based modeling of motion patterns", *Pattern Recognition*, Vol. 43, No. 10, pp. 3636-3647, 2010.
14. S.Khalid, S.Razzaq, "Frameworks for multivariate m-medioids based modeling and classification in Euclidean and general feature spaces", *Pattern Recognition*, Vol. 45, No. 3, pp. 1092-1103, March 2012.
15. Shahid Razzaq, Shehzad Khalid, "Image Matching using Feature Set Transformations", in IEEE ICET, pp. 218-223, September 2011.
16. Shehzad Khalid, "Robust shape matching using global feature space representation of contours", in *ICNC'12-MCC*, pp. 724 – 728, Maui, Hawaii, USA, Feb., 2012.
17. Shehzad Khalid, "Incremental indexing and retrieval mechanism for scalable and robust contour-based shape matching", *Multimedia Systems*, Vol. 18, Issue 4, pp. 319-336, July 2012.
18. Usman Akram, Shehzad Khalid, "Identification and Classification of Microaneurysms for Early Detection of Diabetic Retinopathy", *Pattern Recognition*, Vol. 18, Issue 4, pp. 319-336, July 2013.
19. Sohail Jabbar, Abid Ali Minhas, Imran Shafi, Shehzad Khalid and Rabia Iram, "Intelligent Optimization of Wireless Sensor Network through Bio-Inspired Computing: Survey and Future Directions", <http://dx.doi.org/10.1155/2013/421084>, 2013. (ISI Impact factor: 0.727)
20. Shehzad Khalid, Sadaf Mukhtar, "An approach to improve efficiency and accuracy of sophisticated and intelligent shape matching techniques", IEEE 4th International Conference on Simulation, Modeling and Simulation, Bangkok, Thailand, 29-31 January, 2013.
21. Usman Akram, Shehzad Khalid, Shoab Khan, Detection of Neovascularization in Retinal Images using Multivariate m-Medioids based Classifier, Accepted in *Computerized Medical Imaging and Graphics*, 2013. (ISI Impact factor: 1.487)
22. Shahid Razzaq, Shehzad Khalid, "TOBAE: A density-based agglomerative clustering algorithm", submitted to *Journal of Classification*, 2012.
23. Shehzad Khalid, Usman Akram, Shahid Razzaq, "Motion-based behavior analysis and recognition using multivariate m-Medioids based modeling of trajectory patterns", submitted to *Knowledge and Information Systems*, 2012.
24. Shehzad Khalid, Sadaf Mukhtar, "A hybrid shape matching framework for efficient and effective shape matching", submitted to *Journal of Digital Imaging*, 2012.
25. Shehzad Khalid, Sadaf Mukhtar, "Accurate and efficient shape matching approach using vocabularies of multi-feature space representations", submitted to *Journal of Pattern recognition*, 2012.

26. Usman Akram, Shehzad Khalid, Shoab A. Khan, "Grading of proliferative diabetic retinopathy using multivariate m-Medoids based classifier, submitted to Journal of Optics, 2012.
27. Shahid Razzaq, Shehzad Khalid, "Determination of low particle count in gasses through speed distribution analysis", submitted in journal of Applied probabilities, 2013.
28. Shehzad Khalid, Sannia Arshad, "Framework for constructing hybrid classifier using weight learning to combine heterogeneous classifiers." IEEE 5th International Conference on Computational Intelligence, Communication System and Networks. Madrid, Spain June 2013.
29. Shehzad Khalid, Sannia Arshad, "A Robust Ensemble based Approach to Combine Heterogeneous Classifiers in the Presence of Class Label Noise", Submitted to 8th International Conference on Digital Information Management, Islamabad, Pakistan. September 2013.
30. Sannia Arshad, Shehzad Khalid, "A hybrid approach to combine heterogeneous classifiers using weight learning robust to the presence of class label noise and imbalanced classes", Submitted to Bahria University Journal of Information & Communication Technology, BUJICT Volume V Issue1 - 2013

Supervision:

MPhil Thesis

1. Sohail Safdar, Effective representation and intelligent execution of workflows, 2009
2. Muazzam Gill, Achieving data cleaning through conditional functional dependencies and numerical functional dependencies, 2010.
3. Suleman Amjad, Fingerprint image enhancement for purpose of minutiae detection, 2011.
4. Aafia Kamal, Brand logo recognition based on augmented SURF algorithm, 2011.
5. Zia ur Rehman Hashmi, STANCH: A refinement of SCRUM for requirement engineering, 2011.
6. Junaid Tariq, Affine invariant approach for 2D shape matching, 2011.
7. Sadaf Mukhtar, Piecewise approach for efficient shape matching robust to occlusion, 2012.
8. Sannia Arshad, A genetic algorithm based weight learning method for improving, 2012.
9. Faisal Imran, Content-based image classification using weighted image descriptors, 2012.

PhD Thesis

1. Usman Akram, Retinal Image Analysis and Hybrid Classification for Screening of Diabetic Retinopathy, Completed in 2012.
2. Uzma Jamil, Acute leukemia recognition, In Progress.

Courses Taught:

Under-graduate Level

- Computing Fundamentals, Computer Programming, Data Structures, Object Oriented Programming, Artificial Intelligence

Graduate Level

- Data Warehousing and Mining, Object Oriented Analysis and Design, Research Methodology

PhD Level

- Artificial Intelligence, Neural Networks, Research Methodology

Awards/ Achievements:

- Research project titling “Network enabled retinal image analysis and screening system for grading and diagnosis of diabetic retinopathy” declared best R&D application in PASHA ICT awards and won second prize in Asian Pacific ICT Awards (APICTA)
- HEC approved Ph.D. supervisor
- Head of Bahria University CVPR Research Center
- Awarded a cash award of Rs. 100,000/- by Bahria University on publishing two high quality ISI indexed and one CSI indexed journal paper in the year 2010.
- Member of reviewing committee of ISI indexed journals with impact factors including Journal of Computer Vision and Image Understanding (ISI index: 2.7), Journal of Visual Communication and Image Representation (ISI index: 1.326), Journal of Medical Systems (ISI index: 1.064), IEEE Transactions on System, Man and Cybernetics, Part B (ISI index: 4.68), Journal of information sciences (Impact factor 1.299).
- Member of reviewing committee of other journals and conferences including Majlesi Journal of Electrical Engineering, IEEE International Conference on Advanced Video and Signal-Based Surveillance AVSS 2011, World Congress on Engineering and Computer Science since 2007., ournal of King Saud University - Computer and Information Sciences (JKSU-CIS), Frontier of Information technology (FIT), COMSATS., 5th IEEE ICET 2009.
- Session chair in *IEEE Intl. Symposium on Biometrics and Security Technologies*, 2008.
- Awarded scholarship by Higher Education Commission of Pakistan for Ph.D.