Nazeer Muhammad (PhD)

OVERVIEW

Department of IT and Computer Science
Pak-Austria Fachhochschule Institute of Applied Sciences and Technology, 22620, Mang, Khanpur Road, Haripur, Pakistan
Email-1: nazeer@hanyang.ac.kr
Email-2: nmuhammad@paf-iast.edu.pk
Voice: +92-332-0568-444
Total Post-PhD experience as an Assistant Professor: 08 years
ORCID Link :orcid.org/0000-0002-4056-9854
Researchgate Link :Researchgate Profile-Nazeer Muhammad
Google Scholar Link :Google Scholar profile-Nazeer Muhammad
Total citations in last 5 years: 1900+
Total h-index in last 5 years: 27
Total i10-index in last 5 years: 55
Total accumulative Impact Factor in last 5 years: 150+
Publications in SRJ-Quartiles: Q-1=25, Q-2=31, Q-3=10, Q-4=2
Total number of book chapter: 01
Patent filed: 03 (Filed confirmation No. 1094, 9699, and 1076).
Total number of graduate students supervised with their thesis: 15

SUMMARY

Dr. Nazeer Muhammad is an experienced academic and researcher in the field of AI, specifically in mathematical imaging, machine learning, and data sciences. He holds a PhD from Hanyang University [ranked:156 by QS in 2023], South Korea. Later, he completed post-PhD Teaching and Management training from FH|JOANNEUM, Graz, Austria. He has collaborated with various industries on research and projects, patents, publications and serves as the faculty advisor for the Society of Industrial Robotic. He is working with the National Research Foundation of Korea as a Digital Imaging expert on various projects. Dr. Nazeer Muhammad is also providing consultancy services to SMOG Sighter (image dehazing project) to a Pakistan-based company that provide foggy weather solution for transportation system. He also worked with neurology experts from Rashid Hospital Dubai for neuroimaging solutions. Currently, he is working as an Assistant Professor at Pak-Austria Fachhochschule in the Department of IT and Computer Science. He is also represent mathematical sciences from Pakistan for Economic Cooperation Organization - Science Foundation (ECOSF).

INTERESTS

Mathematical Imaging
Data Science
Machine Learning/Deep Learning

EDUCATION

Fachhoschule Teaching and Management (University of Applied Science) of 30-ECTS *March 2021 to July 2021*, **FH|JOANNEUM, Graz**, Austria

Ph.D. in Applied Mathematics (Image Processing and Data Science) *Spring 2010 to Spring 2015*, **Hanyang University**, South Korea

- Result: Grade A
- Thesis Title: On study of noise reduction and data hiding methods in image processing
- Advisors: Kim, Dai-Gyoung, PhD - Purdue University
- Area of Study: Imaging Processing, Data Science, Machine Learning
- Summary: My PhD research was a joint work of Korean National Research Foundation (NRF) and the Higher Education Commission, Pakistan. We developed Sub-band replacement and fusion processor to deal noise effected and encrypted image data.

The framework was successfully merged with a larger project of Korean NRF defense system.

Mathematics for Machine Learning: Multivariate Calculus, May 2023, an online course authorized by Imperial College London and offered through Coursera

M.Sc, Mathematics, Aug 2005, **University of Sargodha**, Pakistan

- Result: First Division
- Topic: Studies focused in numerical analysis, operation research, mechanics, and mathematical modelling.

B.Sc, Mathematics, Aug 2003, **University of Peshawar**, Pakistan

- Result: First Division
- Topic: Focused in mathematical theory. Actively participated in team projects to create real-world applications. Served as class representative for managing admin responsibilities.

Experience

- Assistant Professor — Springs 2020–to date
  Department of IT and Computer Science
  Pak-Austria Fachhochschule Institute of Applied Sciences and Technology, Mang, Khanpur Road, Haripur, Pakistan

General Duties at Department of IT and Computer Science

- Teaching to Undergraduate & Graduate students
- Project Designing and Implementations
- Studies and Research Board member nominated by executive council for 03 years.
- Boys Hostel Warden
- Member of Departmental Curriculum Committee
- Department IT & CS media Focal person
- Member of Web Committee
- Students Advisors
- To present the Department of IT & CS on Open Day
- Conference Organization and Scientific committees

Duties as Graduate Coordinator

- Overseeing the day-to-day administrative tasks, allocating resources, and coordinating departmental activities
- Playing active role to maintain curriculum of the Graduate programms according to Higher Education Commission (HEC) standards
- Looking after all accreditation activities and process with the National Computing Education Accreditation Council
- Working closely with the student affairs office to ensure that students receive the necessary support and resources to succeed in their studies
- Encouraging research and development activities within the department, identifying funding opportunities, providing resources, and collaborating with faculty members on research projects

Duties as Curriculum Development

- Contributed significantly in the development of the PhD Computer Science, BS, and MS programs in Artificial Intelligence and Data Science
- Member university level committee for the outcome based education (OBE) system implementation
- Contributed significantly by supervising under-graduate and graduate level students

Conference Organization and Scientific committees

- Member of Advance Study and Research Board, nominated by Executive council of PAF-IAST for 03 years on 05 May, 2020.
- Member, Mathematics Houses Internationally designed by Economic Cooperation Organization - Science Foundation (ECOSF), Pakistan

Committees Membership in the Department of IT and Computer Science

- Department Infrastructure and Lab Committee
- Member Adjunct Faculty Evaluation Committee
- Member Departmental Graduate Committee

- Assistant Professor (TTS) Spring 2015– Spring 2020
  Department of Mathematics
  COMSATS University Islamabad, Wah Campus
  47040, Wah Cantt, Pakistan

- Advisor, Society for Industrial Robotics Feb 2022– Till todate
  Society Faculty Advisor
  Department of IT and Computer Science
  Pak-Austria Fachhochschule Institute of Applied Sciences and Technology, Mang, Khanpur Road, Haripur, Pakistan

- Graduate Research Assistant Spring 2010 — 2015
  Digital Media and Information Lab
  Hanyang University, South Korea
  at Department of Mathematics
  to assist Professor Kim, Dai-Gyoung

Courses-Taught

- Artificial Intelligence (Undergraduate)
- Advanced Deep Learning (Graduate)
- Computer Vision & Pattern Identification (Graduate)
- Data Science (Undergraduate)
- Digital Image Processing (Undergraduate)
- Machine Learning (Undergraduate)
- Advanced Big Data Analytics (Graduate)
- Statistics & Mathematical Methods for Data Analysis (Graduate)
- Tools and Techniques for Data Science (Undergraduate)
- Computational Mathematics (Undergraduate)
- Calculus and Analytical Geometry (Undergraduate)
- Numerical Computation (Undergraduate)
- Linear Algebra (Undergraduate)

Collaborations

- Detection of User Emulation Attack Using the Differential Evolution Algorithm Spring 2022—todate
  Saudi Electronic University, Saudi Arabia
  Fatima Jinnah Women University, Pakistan

- Severity recognition of aloe vera diseases using AI in tensor flow domain 2020–to date
  COMSATS University Islamabad, Pakistan

Sejong University, South Korea
HITEC University, Pakistan
King Saud University, Saudi Arabia
Foundation University Islamabad, Pakistan

- Advancement in haze removal approaches 2020–to date
  Chongqing University of Posts and Telecommunications, China

- Separable property-based super-resolution of lousy image data 2019–to date
  University Putra Malaysia, Malaysia

- Image noise reduction based on block matching in wavelet frame domain 2019–to date
  Hanyang University, South Korea
  Fatima Jinnah Women University, Pakistan
  COMSATS University Islamabad, Pakistan

- Cardioprotective Effects of Sphingosine-1-Phosphate Receptor Model of Cardioplegic Arrest 2018–to date
  The Aga Khan University, Pakistan
  University of Verona, Italy
  University of Liverpool, United Kingdom
  King Saud University, Saudi Arabia
  COMSATS University Islamabad, Pakistan

- Face recognition approaches 2017–to date
  COMSATS Institute of Information Technology, Pakistan
  Fatima Jinnah Women University, Pakistan
  University of Twente, Netherland

- Human visual enhancement using Multi Scale Retinex 2016–to date
  COMSATS University Islamabad, Pakistan
  Fatima Jinnah Women University, Pakistan
  Department of Neurology, Rashid Hospital, UAE
  The Aga Khan University, Pakistan

- Image de-noising with subband replacement and fusion process using bayes estimators 2015–to date
  Fatima Jinnah Women University, Pakistan
  University of Manchester, UK
  University of Education, Pakistan
  COMSATS Institute of Information Technology, Pakistan
  Gachon University, South Korea
  Hanyang University, South Korea

- Boosting the Accuracy of AdaBoost for Object Detection and Recognition 2013–to date
  COMSATS Institute of Information Technology, Pakistan
  North Dakota State University, USA

- Equation-method for correcting clipping errors in OFDM signals 2012–to date
  Fatima Jinnah Women University, Pakistan

Manchester Metropolitan University, UK
The University of Manchester, UK

Research Grants/Project Experience

Research Assistant — May 2010 to August 2012

- Digital Media and Information Lab,
  Hanyang University
  Project: Robust Data Hiding Algorithm using Fresnelet transform
  Supervisor: Prof. Kim, Dai-Gyoung Status: Completed

Research Assistant — Sept 2011 to May 2013

- Department of Electrical Engineering,
  Kangwon University
  Project: Resolution Enhancement for Digital Off-axis Hologram
  Supervisor: Kim, Dai-Gyoung, PhD Status: Completed

Research Assistant — Sept 2012 to Aug 2014

- Department of Mathematics,
  Hanyang University
  Project: Image Noise Reduction using Bayesian Approach
  Supervisor: Kim, Dai-Gyoung, PhD Status: Completed

Principal Investigator — April 2017 to Oct 2017

- Department of Mathematics,
  COMSATS Institute of Information Technology
  Project: Reversible Integers Wavelet Transform for Blind Image Hiding Method
  Project Reference: 21-1399/SRGP/R-D/HEC/2016 Project Fund Approved: 0.45/0.5M
  Status: Completed

Principal Investigator — Project proposal accepted 2018-2019

- Department of Mathematics,
  COMSATS Institute of Information Technology
  Project: Salient Features Retrieval Proposal using Denoising and Enhancement of Brain Modalities in Hologram Domain
  Project Reference: 10496/HEC/NRPU
  Project fund approved: 13.99 Million
  Status: Completed

Co-Principal Investigator — April 2023...

- Project: Building a Stronger Future: Empowering IT and Tech Education in Public Schools of Pakistan through Capacity Building
  Project Reference: Spencer Foundation Small Research Grants program Project Fund Approved: 50000$ demand
  Status: In-progress

Co-Principal Investigator — Feb 2023 to ...

- Project: Development for Conversion of 1000cc IC Engine into Electric Drive System Motor
  Project Reference: Competitive Research Programme. Energy Project Fund Approved: 8 Million PKR demand
  Status: In-progress

Principal Investigator Feb 2023 to ...

- Project: Right Aptitude and Skills Test using Artificial Intelligence
  Project Reference: Innovative Seed Fund, HEC, Asian Bank Project Fund Approved: 36000$ demand
  Status: In-progress

Principal Investigator Feb 2023 to ...

- Project: AI Interference Engine Development for early stage diagnosing of the brain modalities
  Project Reference: Frontiers of Science Grants Program, Directorate General of Science and Technology, KPK Project Fund Approved: 9 million PKR demand
  Status: In-progress

Awards

Scholarship Awards

- Overseas Scholarship for MS/MPhil Leading To PhD in Selected Fields Phase-II" Batch-II" for South Korea Oct 2009
- Hanyang University, South Korea, Excellent Scholarship Award, 2010 2011
- Hanyang University, South Korea, Honor Scholarship Award, 2010 2012

Travel Awards

- Case Studies on novel image encryption technique using Fresnelet transform presented at Manchester and London, UK, sponsored by National Research Foundation of Korea (NRF) funded by the Korean government (MEST) (NRF-2011-0026245) June 2012

Research Awards

- COMSATS Institute of Information Technology awarded a Research Productivity Award in appreciation of research contributions Oct 2015

Honorarium Awards

- Honorarium Award in form of Ceritifcate of appreciation and cash from COMSATS University Islamabad, best faculty member of the Department of Mathematics for year 2017

Presentations

- Robust Watermarking Technique by Using LU Decomposition Method, School Seminar, Division of Applied Mathematics, Hanyang University, South Korea Jan 2011
- Application of Fresnelet Basis, School Seminar, Department of Electrical and Mechanical Engineering, Kangwon University, South Korea Apr 2012
- BM3D-SDT Hybrid Model for Image De-noising, School Seminar, Division of Applied Mathematics, Hanyang University, South Korea Jan 2013
- On study of noise reduction and data hiding methods, School Seminar, SNS, National University of Science and Technology (NUST), Pakistan March 2015
- Edge Enhanced Image Denoising Method in Wavelet Domain, 11th Symposium on Computational Complexities, Innovations and Solutions COMSATS IIT, Abbotabad May

2016

- Dynamic Mathematical Teaching Approach, COMSATS IIT, Wah Cantt Nov 2016
- Image De-noising using Bayes Estimators in Wavelet Domain, Centre for Advanced Studies in Mathematics (CASM) & Department of Mathematics, Conference on Applied Mathematics at LAHORE UNIVERSITY OF MANAGEMENT SCIENCES (LUMS). May 2017

Patents

1. "316 Stainless Steel Hollow Cylindrical Hot Metallic Samples Holder", (PA000220, Docket No. 33102.23S) (Filed confirmation No. 1094).
2. "Novel Deign of Solar Thermal Integrated Declination and Steam Production Unit" (PA000183 Docket No. 33102.53S) (Filed confirmation No. 9699)
3. "Open Land Overhead Movable Nozzle Sprinkle (Rain) Irrigation System for Uneven Lands", (PA000187 Docket No. 33101.68S) (Filed confirmation No. 1076)

Refereed Sample Publications

1. **Muhammad, Nazeer**, Hira Khan, Nargis Bibi, Muhammad Usman, Naseer Ahmed, Shahid Nawaz Khan & Zahid Mahmood. "Frequency component vectorisation for image dehazing." Journal of Experimental & Theoretical Artificial Intelligence, (2021), 33:6, 919-932.
   DOI.org/10.1080/0952813X.2020.1794232, (*IF-2.340*).
2. **Muhammad, Nazeer**, N Bibi, MA Shah, S Zainab, I Ullah, Z Mahmood. "An entropy based salient edge enhancement using fusion process." Applied Mathematical Modelling, (2021), 93, 525-537.
   DOI.org/10.1016/j.apm.2020.12.002, (*IF-5.336*).
3. Hira Khan, Muhammad Sharif, Nargis Bibi, Jamal H Shah, Sajjad A Haider, Saira Zainab, Muhammad Usman, Yasir Bashir, **Muhammad, Nazeer**. "Localization of Radiance Transformation for Image Dehazing in Wavelet Domain", Neurocomputing, 381, 141-151 (2020).
   DOI.org/10.1016/j.neucom.2019.10.005, (*IF-4.072*).
4. **Muhammad, Nazeer**, Nargis Bibi, Abdul Wahab, Zahid Mahmood, Tallha Akram, Syed Rameez Naqvi, Hyun Sook Oh and Dai-Gyoung Kim. "Image De-Noising with Subband Replacement and Fusion Process Using Bayes Estimators." Computers & Electrical Engineering, (2018), 70, Pages 413-427.
   DOI.org/10.1016/j.compeleceng.2017.05.023, (*IF-1.747*).
5. **Muhammad, Nazeer** , Nargis Bibi, Adnan Jahangir and Zahid Mahmood. "Image Denoising with Norm Weighted Fusion Estimators." Pattern Analysis and Applications, 21 (4), 1013-1022 (2018).
   DOI: 10.1007/s10044-017-0617-8, (*IF-1.41*).

Sample Refereed Conferences

1. **Muhammad, Nazeer** and D. G. Kim, A novel Fresnlet based robust data hiding algorithm for medical images, 2012 IEEE International Conference on Imaging Systems and Techniques Proceedings, Manchester, 2012, pp. 213-216.
2. **Muhammad, Nazeer** and Dai-Gyoung Kim. An Efficient Data Hiding Technique in Frequency domain by using Fresnelet Basis. Proceedings of the World Congress on Engineering. Imperial College London, UK.Vol. 2. 2012.
3. Maaz, I., Muhammad, U., Urooj, M., Nabila, N., Khasan, K., **Muhammad, Nazeer** Kiran, S. "Numerical analysis of the indium compositional variation on the efficiency droop of the GaN-based light-emitting diodes" SPIE Optical Engineering + Applications, San Diego, California, USA, volume 10755, 2018.

Refereed Book Chapter

1. **Muhammad, Nazeer** and D.G. Kim, Resolution Enhancement for Digital Off-Axis Hologram Reconstruction, in IAENG Transactions on Engineering Technologies: Special Volume of the World Congress on Engineering 2012, G.C. Yang, S.-I. Ao, and L. Gelman, Editors. 2013, Springer Netherlands: Dordrecht. p. 431-443.

Supervised Students

1. Hassan Ghani — MS student
   Status: Completed — Fall-2018
   Registration Number: CIIT/FA18-RMT-001-WAH
   Thesis Title: Steganalysis Using Catalyst Kernals and Transfer Learning in CNN Domain

2. Saqib Hussain Tahir — MS student
   Status: Completed — Fall-2018
   Registration Number: CIIT/FA18-RMT-009-WAH
   Thesis Title: Segmentation of the Lungs and Their Lesions in Computed Tomography Images

3. Shoaib khan — MS student
   Status: Completed — Fall-2018
   Registration Number: CIIT/FA18-RMT-004-WAH
   Thesis Title: Brain Tumor Detection Using Neural Network Gradients Orientation in Scale-Invariant Wavelet Transform

4. Sana Munir Khan — MS student
   Status: Completed — Fall-2017
   Registration Number: CIIT/FA17-RMT-004-WAH
   Thesis Title: Segmentation of Defective Lung Region Using Integral Transforms in Radon Domain Using the Sigmoid Function

5. Rubab — MS student
   Status: Completed — Fall-2017
   Registration Number: CIIT/FA17-RMT-008-WAH
   Thesis Title: Automatic Detection of Aloe Vera Disease by Using the Tensor Flow Approach

6. Sarwat Aamina — MS student
   Status: Completed — Fall-2016
   Registration Number: CIIT/FA14-RCS-010-WAH
   Thesis Title: Copy-Move Forgery Detection in Digital Images Using Passive Approach

7. Hira Khan — MS student
   Status: Completed — Fall-2017
   Registration Number: CIIT/SP16-RCS-008-WAH
   Thesis Title: Haze Line Image Dehazing Using Radiance Transformation in Wavelet Domain

8. Atta Ullah Qazi — MS student
   Status: Completed — Fall-2017
   Registration Number: CIIT/FA-14/REE-011/WAH
   Thesis Title: Implementation Of Auto Focusing In IR Imaging Systems.

9. Isra Naz — MS student
   Status: Completed — Fall-2017
   Registration Number: CIIT/SP16-RCS-004/WAH
   Thesis Title: Robust Discrimination of Leukocytes Protuberant Types with Early Diagnosis of Leukemia

10. Zulqarnain — MS student
    Status: Completed — Fall-2017
    Registration Number: CIIT/SP16-RCS-007 WAH
    Thesis Title: Novel Fault Tolerant Routing Scheme for Networking Operation on Chip using 2D Mesh Topology

11. Ziaullah Khan — MS student
    Status: Completed — Fall-2017
    Registration Number: CIIT/SP16-REE-010/WAH
    Thesis Title: Automatic Detection and Classification of Infected Regions of Plant Diseases

12. Muhammad Kashif Akram — MS student
    Status: Completed — Fall-2017
    Registration Number: CIIT/FA15-RCS-003 WAH
    Thesis Title: An Adaptive and Dynamic Fault Tolerant Routing Algorithm for NoC.

13. Hajra Faraz Khan — MS student
    Status: Completed — Fall-2016
    Registration Number: CIIT/FA-16/REE-004/WAH
    Thesis Title: Area efficient implementation of low complexity error correcting codes.

14. Alamdar Hussain — MS student
Status: Completed — Fall-2015
Registration Number: CIIT/SP15-REE-008/WAH
Thesis Title: Performance Analysis of various adaptive PID controllers for Noisy systems

15. Shahid Nawaz Khan — PhD student
Status: Completed — 2022
Registration Number: CIIT/FA14-R65-003/ATD
Thesis Title: Fast Encoding Techniques for Multi-View High Efficiency Video Coding (MV-HEVC)

Journals Reviewer

IEEE Transactions on Industrial Informatics
IEEE Communications Magazine
Computing, Springer
The Computer Journal, Oxford University Press
Electrical and Computer Engineering, Elsevier
KSII Transactions on Internet and Information Systems
Journal of Information Science and Engineering
Applied Sciences
Entropy
Neural Computing and Applications
Symmetry
IET Image Processing
IET Intelligent Transport Systems
Sensors
Mathematics
Sustainability
Electronics Letters
IET Signal Processing
Information
Iranian Journal of Science and Technology-Transactions of Electrical Engineering
Luminescence:the Journal of Biological and Chemical Luminescence

References

Kim, Dai-Gyoung — (PhD from Purdue University, USA)
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Department of Applied Mathematics — dgkim@hanyang.ac.kr
Hanyang University, South Korea

Nargis Bibi — (PhD from University of Manchester, UK)
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Fatima Jinnah Women University Rawalpindi, Pakistan

Sohail Khan — (PhD from Technical University of Vienna, Austria)
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Sino-Pak Center for Artificial Intelligence (SPCAI), Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology.

Rasheed Hussain (PhD from Hanyang University, South Korea)
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University of Bristol

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Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, Pakistan