# Dr. Zakir Khan




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## Summary

Accomplished researcher and Assistant Professor with a Ph.D. in Computer Science specializing in AI and Machine Learning for Medical Imaging. Proven track record of publishing in high-impact journals and leading innovative research projects. Highly skilled in developing cutting-edge AI algorithms and practical applications in medical imaging. Passionate about teaching and mentoring students, with extensive experience in curriculum development, academic program design, and effective delivery of complex technical content.


## Education

### Ph.D. in Computer Science

*Hazara University, Mansehra, Pakistan*

CGPA: 4.0/4.0

Thesis: *3DcGAN: 3D Conditional Generative Adversarial Network*

2024

### M.S. in Computer Science

*Hazara University, Mansehra, Pakistan*

CGPA: 3.75/4.0

Thesis: *Threshold-based Steganography: Threshold Based LSB Image Steganography*

2015

### B.S. in Computer Science

*Hazara University, Mansehra, Pakistan*

CGPA: 3.77/4.0

Thesis: *LSB Image Steganography*

2011

## Professional Experience

### Assistant Professor

*Department of Computer Science, NUST Baluchistan Campus*

Sep 2024 – Present

- Teaching ICT, Programming, Computer Vision, Research Methodology (UG + PG)
- Conducting research in AI, Machine Learning
- Contributing to curriculum updates and departmental activities.

### Lecturer

*Department of IT, Hazara University, Mansehra*

2020 – 2024

- Developed and taught courses in AI, Machine Learning, and Image Processing.
- Supervised student research projects and theses.
- Published research findings in high-impact journals.

### IT Lecturer

*GHS Shamdhara, Oghi, Mansehra*

2014 - 2020

- Taught courses in Programming, Web Engineering
- Implemented modern teaching techniques to enhance student learning.

## Research Experience

**Research Associate**
*Deep Learning Based Prediction Support System for Anaemic RBC Imaging*
National Research Program for Universities (NRPU) - Project No. 16107
June 2022 – July 2024

- Actively involved as a Research Associate in this NRPU-funded project.
- The project is funded with a total cost of Rs. 2,462,250.
- Responsibilities include developing deep learning models for predicting anaemic conditions from RBC images.
- Collaborated with a team of researchers to design and implement the prediction support system.
- Contributed to the publication of research findings in high-impact journals.

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## Selected Publications

1. **AneRBC dataset: a benchmark dataset for computer-aided anemia diagnosis using RBC images** *Database* (*2024*). Impact Factor: 3.4
2. **A Framework for Segmentation and Classification of Blood Cells Using GANs** *IEEE Access* (2024). Impact Factor: 3.9
3. **Face Recognition via Multi-Level 3D-GAN Colorization** *IEEE Access* (2022). Impact Factor: 3.9
4. **Lung's Segmentation Using Context-Aware Regressive Conditional GAN** *Applied Sciences* (2022). Impact Factor: 2.838
5. **Automatic Eczema Classification in Clinical Images Based on Hybrid Deep Neural Network** *Computers in Biology and Medicine* (2022). Impact Factor: 6.698

(For the full list of publications, please refer to the attached document)

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## Research Interests

- Machine Learning
- Artificial Intelligence
- Artificial Neural Networks
- Generative AI
- Prompt Engineering
- Information Security
- Image Processing
- Medical Imaging

## Courses Taught

- Computer Vision
- Research Methodology
- Artificial Intelligence
- Digital Image Processing
- Programming Fundamentals
- Information & Communications Technologies
- Object-Oriented Programming

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## Technical Skills

- **Programming Languages**: Python, Matlab, C/C++, Java, C#, PHP, JavaScript
- **IT Skills**: Microsoft Office Suite, Windows, Linux, Macintosh
- **Database Management**: MySQL, MS SQL, MS Access
- **Simulation Tools**: MATLAB, Cisco Packet Tracer

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## Honors and Awards

- BSCS Gold Medal in Computer Science, Hazara University Mansehra

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## Conferences and Workshops

- 3rd IAPR Summer School on Document Analysis, Pakistan Pattern Recognition Society, 2019
- International Conference on Big Data and Data Mining, Kentucky, USA, 2015
- 30th Multi Topic International Symposium, IEEEP Karachi Center, 2015

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## Internships and Certificates

- 6-Month Internship as Web Developer, KP IT Board, 2013
- Modeling and Simulation using MATLAB, iversity online, 2014
- Getting Started with Kaggle, Coursera Project Network, 2022
- Visualizing Filters of a CNN using TensorFlow, Coursera Project Network, 2022
- Machine Learning Roadmap for 2023, CloudX Lab, 2022
- How to Dockerise an Image Classification App, 2022

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## References

**Dr. Hamad Sherazi**
Assistant Professor, Computer Science & IT
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**Dr. Muhammad Naeem**
Associate Professor, Computer Science
Abbottabad University of Science & Technology, Abbottabad
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**Dr. Danish Shahzad**
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**Dr. Muhammad Shahzad**
Assistant Professor, Computer Science
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# List of Publications:

## Journal Publications:

1. Shahzad, M., Shirazi, S. H., Yaqoob, M., **Khan, Z.,** Rasheed, A., Ahmed Sheikh, I., ... & Zhou, H. (2024). AneRBC dataset: a benchmark dataset for computer-aided anemia diagnosis using RBC images. *Database*, *2024*, **(IF:3.4)**
2. **Khan, Z.,** hamad Shirazi, S., Shahzad, M., Munir, A., Rasheed, A., Xie, Y., & Gul, S. (2024). A Framework for Segmentation and Classification of Blood Cells Using Generative Adversarial Networks. *IEEE Access*. **(IF:3.9)**
3. **Khan, Zakir,** Arif Iqbal Umar, Syed Hamad Shirazi, Muhammad Shahzad, Muhammad Assam, Muhammad Tarek IM El-Wakad, and El-Awady Attia. "Face Recognition via Multi-Level 3D-GAN Colorization." IEEE Access 10 (2022): 133078-133094. **(IF:3.9)**
4. **Khan, Z**., Umar, A. I., Shirazi, S. H., Rasheed, A., Yousaf, W., Assam, M., ... & Mohamed, A. (2022). Lung's Segmentation Using Context-Aware Regressive Conditional GAN. *Applied Sciences*, *12*(12), 5768. (**IF: 2.838)**
5. Shahzad, M., Umar, A. I., Shirazi, S. H., Khan, **Z., Khan**, A., Assam, M., ... & Attia, E. A. (2022). Identification of Anemia and Its Severity Level in a Peripheral Blood Smear Using 3-Tier Deep Neural Network. *Applied Sciences*, *12*(10), 5030. (**IF: 2.838**)
6. Rasheed, A., Umar, A. I., Shirazi, S. H., **Khan, Z**., & Shahzad, M. (2022). Cover-based multiple book genre recognition using an improved multimodal network. *International Journal on Document Analysis and Recognition (IJDAR), 1-24*. **(IF:2.3)**
7. Rasheed, A., Umar, A. I., Shirazi, S. H., **Khan, Z.,** Nawaz, S., & Shahzad, M. (2022). Automatic eczema classification in clinical images based on hybrid deep neural network. *Computers in Biology and Medicine*, *147*, 105807. (**IF:6.698**)
8. Ishaq, W., Buyukkaya, E., Ali, M., & **Khan, Z.** (2021). VCC-BPS: Vertical Collaborative Clustering using Bit Plane Slicing. *Plos one*, *16*(1), e0244691. (**IF:3.752**)
9. **Khan, Z.,** Umar, A, I., Shirazi, S, H., Rasheed, A., Qadir, A., Gul, S., (2020). Image based Analysis of Meibomian Gland Dysfunction Using Conditional Generative Adversarial Neural Network, BMJ open ophthalmology. **(IF:2.59)**
10. Yousaf, Waqas, Arif Umar, Syed Hamad Shirazi, **Zakir Khan**, Imran Razzak, and Mubina Zaka. "Patch-CNN: Deep learning for logo detection and brand recognition." *Journal of Intelligent & Fuzzy Systems* Preprint: 1-14. **(IF: 1.737)**
11. Shahzad, M., Umar, A. I., Khan, M. A., Shirazi, S. H., **Khan, Z**., & Yousaf, W. (2020). Robust Method for Semantic Segmentation of Whole-Slide Blood Cell Microscopic Images. *Computational and Mathematical Methods in Medicine*, *2020*. (**IF: 2.809**)
12. Shahzad, M., Umar, A. I., Shirazi, S. H., Pervez, M. T., **Khan, Z.,** & Yousaf, W. (2019). HCDP: Hepatitis C Data Bank of Pakistan. *JOURNAL OF ENGINEERING AND APPLIED SCIENCES*, *38*(2), 19-30. **(IF:0.118)**

13. **Khan, Z.,** Shah, M., Naeem, M., Mahmood, T., Khan, S., Amin, N. U., & Shehzad, D. (2016). Threshold-based steganography: a novel technique for improved payload and SNR. **(IF:0.83)**
14. Shehzad, D., **Khan, Z**., Dağ, H., & Bozkuş, Z. (2016). A novel hybrid encryption scheme to ensure Hadoop based cloud data security. *International Journal of Computer Science and Information Security (IJCSIS)*, *14*(4).
15. Mahmood, T., Mehmood, Z., Shah, M., & **Khan, Z.** (2018). An efficient forensic technique for exposing region duplication forgery in digital images. *Applied Intelligence*, *48*(7), 1791-1801. **(IF:1.172)**
16. Husain, J., Amin, N. U., Shah, W. A., Umar, A. I., **Khan, Z**., & Shehzad, D. (2016). A Novel Weighted Clustering Mechanism for Wireless Sensor Networks. *International Journal of Computer Science and Information Security*, *14*(11), 1005.
17. Shoaib, M., **Khan, Z.,** Shehzad, D., Dag, T., Umar, A. I., & Amin, N. U. (2016). Performance Improvement of Threshold based Audio Steganography using Parallel Computation. *Performance Improvement*, *7*(10).
18. Umar, A. I., Amin, N. U., Qadir, A., & **Khan, Z.** (2016). An Improved Invert Threshold Based LSB Steganography. *International Journal of Computer Science and Information Security (IJCSIS)*, *14*(8).
19. Rehan Ullah, **Zakir Khan**, Noor Ul Amin, Mohsin Shah, Arif Iqbal Umar, Abdul Hakeem. (2016). Audio Steganographic Technique Based On Fletcher Munson Curve. *J. Appl. Environ. Biol. Sci*., 6(6), 69-77
20. Mahmood, T., Nawaz, T., Shah, M., **Khan, Z.,** Ashraf, R., & Habib, H. A. (2016). Copy-move forgery detection technique based on DWT and Hu Moments. *International Journal of Computer Science and Information Security (IJCSIS)*, *14*(5).
21. Shehzad, D., **Khan, Z.,** Dağ, H., & Bozkuş, Z. (2016). A novel hybrid encryption scheme to ensure Hadoop based cloud data security. *International Journal of Computer Science and Information Security (IJCSIS)*, *14*(4).
22. Tayyab, M. U., Shah, M., Mahmood, T., & **Khan, Z**. (2014). Design of Low Dispersion Photonic Crystal Fiber Using Smoothing Filter Coefficients. *Journal of Basic and Applied Scientific Research*, 2090-4304.

**Conference Papers:**

1. **Khan, Z.,** Shah, M., Naeem, M., Shahzad, D., & Mahmood, T. (2014, November). LSB steganography using bits complementation. In *International Conference on Chemical Engineering and Advanced Computational Technologies (ICCEACT)*.
2. **Khan, Z.,** Shah, M., Naeem, M., Shahzad, D., & Mahmood, T. (2014, November). LSB steganography using bits complementation. In *International Conference on Chemical Engineering and Advanced Computational Technologies (ICCEACT)*.
3. Mahmood, T., Nawaz, T., Mehmood**, Z., Khan**, Z., Shah, M., & Ashraf, R. (2016, August). Forensic analysis of copy-move forgery in digital images using the stationary wavelets. In *2016 Sixth International Conference on Innovative Computing Technology (INTECH)* (pp. 578-583). IEEE.
4. Islam, M., Shah, M., **Khan, Z.,** Mahmood, T., & Khan, M. J. (2015, December). A new symmetric key encryption algorithm using images as secret keys. In *2015 13th International Conference on Frontiers of Information Technology (FIT)* (pp. 1-5). IEEE.
5. Islam, A. U., Khalid, F., Shah, M., **Khan, Z**., Mahmood, T., Khan, A., ... & Naeem, M. (2016, August). An improved image steganography technique based on MSB using bit differencing. In *2016 Sixth International Conference on Innovative Computing Technology (INTECH)* (pp. 265-269). IEEE.
6. Mahmood, T., Nawaz, T., Ashraf, R., Shah, M., **Khan, Z.,** Irtaza, A., & Mehmood, Z. (2015, December). A survey on block based copy move image forgery detection techniques. In *2015 International Conference on Emerging Technologies (ICET)* (pp. 1-6). IEEE.
7. Qadir, A., Shah, M., **Khan, Z.,** Mahmood, T., Amin, N. U., & Hakeem, A. Efficient Hybrid Image Steganography Based on Pattern Matching.
8. Hakeem, A., **Khan, Z**., Ahmad, A., Shah, M., Qadir, A., & Amin, N. U. Magic Random Bits LSB Audio Steganography.
9. Mahmood, T., Nawaz, T., Ashraf, R., Shah, M., **Khan, Z.,** Irtaza, A., & Mehmood, Z. (2015, December). A survey on block based copy move image forgery detection techniques. In *2015 International Conference on Emerging Technologies (ICET)* (pp. 1-6). IEEE.
10. Hakeem, A., Amin, N. U., Shah, M., **Khan, Z.,** & Qadi, A. (2014). Threshold based LSB audio steganography. In *Int'l Conf. on Chemical Engineering & Advanced Computational Technologies* (pp. 88-92).

11. Shehzad, D., Ishaq, W., **Khan, Z.,** & Iqbal, J. (2014). An Enhanced Weight Based Clustering Algorithm for Mobile Adhoc Networks. In *Proceedings of International conference on Computer Science and Information Systems* (pp. 116-118).