

DR. SHAFIQ HUSSAIN

Associate Professor of Computer Science •
Cybersecurity & Formal Methods

Department of Computer Science, University of
Sahiwal, Pakistan



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Sahiwal, Punjab, Pakistan

20+

YEARS IN ACADEMIA

1,107

CITATIONS

19 / 24

H-INDEX / I10-INDEX

67+

PUBLICATIONS

PROFESSIONAL SUMMARY

Accomplished academic leader with over two decades of experience spanning teaching, research, and institutional leadership in computer science. Proven record of establishing new academic departments and degree programmes, and of directing large-scale Higher Education Commission (HEC) development projects — including preparation and approval of a PC-1 valued at Rs. 1,366.937 million. Combines deep technical expertise in cybersecurity and formal methods (Event-B, Z Notation) with strong strategic planning, project management, and stakeholder engagement skills. Shortlisted for the post of Vice Chancellor at multiple Pakistani universities in 2024. Seeking a senior academic or administrative leadership role where this blend of scholarship and institution-building can drive continued excellence.

RESEARCH INTERESTS

- **Cyber** Security
- **Software** Modeling using Formal Methods
- **Modeling** of Secure Software Systems
- **Formal** Methods in System Design
- **Modeling** using Event-B and RODIN Tools
- **Formal** Verification & Validation of Software

TEACHING INTERESTS

- **Cyber** Security
- **Programming** Fundamentals
- **Object** Oriented Programming
- **Software** Engineering & Software Security
- **Secure** Software Design and Development
- **Formal** Methods in Software Engineering
- **Formal** Verification and Validation
- **Database** Systems

ACADEMIC QUALIFICATIONS

PhD, Software Engineering

2009 – 2013

University of Sunderland, United Kingdom

Thesis: Formal Development Methodology for Secure Web Applications (FDMSWAP) • Specialization: Cyber Security

M.Sc. Computer Science: *Bahauddin Zakariya University, Multan, Pakistan* • 3.04 / 4.00

1998 – 2000

B.Sc. *Bahauddin Zakariya University, Multan, Pakistan* • 81%

1994 – 1996

F.Sc. Pre-Engineering: *BISE, Multan, Pakistan • 67%*

1991 – 1993

Matriculation (Science): *BISE, Multan, Pakistan • 77%*

1989 – 1991

DISTINCTIONS & AWARDS

- Shortlisted for interview for the post of Vice Chancellor at multiple universities across Pakistan (2024).
- Awarded a fully funded Overseas Scholarship for PhD studies in the United Kingdom.
- Prepared the first PC-1 (Rs. 1,366.937 million) for the University of Sahiwal Development Project and secured approval from all relevant Government of Pakistan bodies.

ACADEMIC EXPERIENCE

Associate Professor, Department of Computer Science

Jan 2020 – Present

University of Sahiwal, Pakistan

Assistant Professor, Department of Computer Science

Jun 2015 – Jan 2020

University of Sahiwal, Pakistan

PhD Studies

Mar 2009 – Feb 2013

University of Sunderland, United Kingdom

Lecturer, Computer Science (Regular)

Jun 2004 – Mar 2009

Center for Undergraduate Studies, Bahauddin Zakariya University, Multan, Pakistan

Lecturer, Computer Science (Contract)

Oct 2002 – Jun 2004

Center for Undergraduate Studies, Bahauddin Zakariya University, Multan, Pakistan

ADMINISTRATIVE LEADERSHIP EXPERIENCE

Chairman, Department of Computer Science

2020 – 2023, 2024 – Present

University of Sahiwal, Pakistan

- Established a new Department of Software Engineering within the Faculty of Computing and Information Technology.
- Established a new Department of Information Technology within the Faculty of Computing and Information Technology.
- Launched new BS Software Engineering programme (Morning & Evening sessions).
- Launched new BS Information Technology programme (Morning & Evening sessions).

Founder & Head, Department of Computer Science

Sep 2014 – Oct 2018

Bahauddin Zakariya University, Sub-Campus Sahiwal, Pakistan

- Established the Department of Computer Science from inception.
- Launched the BS Computer Science degree programme in both morning and evening sessions.

Director, Planning and Development

Feb 2020 – Jan 2023

University of Sahiwal, Pakistan

- Directed execution of the "Development of University of Sahiwal" project as per its approved PC-1.
- Hired development consultants through open competition per PPRA Pakistan guidelines and Planning Commission SOPs.

Project Director, HEC Development Project — "Development of University of Sahiwal" **Oct 2018 – Feb 2020**

Higher Education Commission, Pakistan

- Prepared the University's PC-1 amounting to Rs. 1,366.937 million.
- Secured approval from HEC Islamabad and the Planning Commission of Pakistan; project included in the PSDP for 2020–21.

Director IT

Oct 2018 – Jul 2021

University of Sahiwal, Pakistan

- Supervised development of the University's official website.
- Established campus internet infrastructure in collaboration with HEC Islamabad.
- Established the PERN Centre at the University of Sahiwal.
- Set up access to the HEC Digital Library, Turnitin, and Microsoft products via PERN-HEC.

Project Director, HEC Development Project

Jun 2013 – Jul 2018

Bahauddin Zakariya University, Sub-Campus Sahiwal, Pakistan

- Supervised the full HEC development project for the Sahiwal sub-campus.
- Procured furniture, fixtures, laboratory and office equipment, and completed campus electrification.
- Supervised construction and commissioning of new campus buildings.

Campus Director

Nov 2016 – Mar 2018

University of Sahiwal, Pakistan

- Developed the University's barren land into a functioning campus, including water channels and large-scale plantation.
- Obtained NOC from HEC Islamabad for the newly established university.
- Launched new academic programmes.

Campus Director, Directorate of Distance Education

Nov 2016 – Mar 2018

Bahauddin Zakariya University, Sub-Campus Sahiwal, Pakistan

- Managed 15 postgraduate-level distance learning programmes.
- Extended access to quality education for working professionals and students in under-served areas via weekend delivery.

In-Charge Examinations

Jun 2005 – Oct 2007

Center for Undergraduate Studies, Bahauddin Zakariya University, Multan, Pakistan

- Supervised the complete examination process for the Center.
- Managed the result-preparation process for the Center.

Superintendent, Ali Hall (Hostel)

Mar 2005 – May 2006

Bahauddin Zakariya University, Multan, Pakistan

- Managed the men's hostel, including mess operations and related administration.
- Oversaw student accommodation and associated welfare matters.

Assistant Superintendent, Ali Hall (Hostel)

Mar 2003 – Mar 2005

Bahauddin Zakariya University, Multan, Pakistan

- Established and launched the university's new men's hostel.
- Delivered state-of-the-art facilities for incoming residents.

TOOLS & TECHNOLOGIES

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| ▶ Event-B (formal method for complex systems) | ▶ Z Notation and Z/EVES Prover |
| ▶ Rodin Platform for Event-B modelling | ▶ STRIDE Threat Modelling |
| ▶ Atelier-B Provers | ▶ DREAD Risk Assessment Model |
| ▶ ProB Model Checker & AnimB | ▶ Zotero & EndNote (reference management) |

RESEARCH SUPERVISION

PhD Supervision

#	Degree	Thesis Title
1	PhD (Malaysia)	A Deep Learning Framework for Logo Detection and Recognition using Multiscale and Multi-Contextual Feature Fusion

MS / MPhil Supervision (27 students)

Undergraduate Supervision

Supervised 500+ Final Year Projects (FYPs) for undergraduate students across a broad range of topics, tools, and technologies.

JOURNAL PUBLICATIONS (67)

- [1] S. Hussain, M. Husnain, A. Jamil, M. Usman, A. Amjad. "A Hybrid Deep Learning Approach for Predicting Academic and Professional Outcomes." *Educational Research and Innovation*, 6(1), 17–30, 2026.
- [2] M. Azhar, M. Arman, A. Amjad, D. A. Dewi, M. U. Ahmad, S. Hussain. "Explainable Transformer-Based Framework for Suicide Risk Detection." *Information*, 17(5), Art. 448, 2026.
- [3] M. I. Hussain, S. Hussain, A. Jamil, A. Amjad, S. Iqbal. "Analyzing the Impact of Pretrained Language Models on Low-Resource Languages." *Journal of Computing & Biomedical Informatics*, 11(1), 2026.
- [4] M. T. Mumtaz, M. K. Awang, M. U. Saeed, S. Hussain, D. Ben Noureddine, Y. Daadaa. "LogoXpertNet: A Novel Lightweight Logo Classification Using Deep Learning." *Scientific Reports*, 2026.
- [5] Y. Helda, S. H. Shafiq, S. Irfa. "Automated Feature Engineering Using Meta-Learning for Efficient and Generalizable Data Science Pipelines." *Journal of Data Science*, (4), 60–79, 2026.
- [6] R. Abdulrahman, A. Jamil, A. Amjad, S. Hussain, M. Azhar, Z. Aslam, I. Shabbir, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "Automated Deep Learning Approaches for Multimodal Emotion Recognition: A Review of Fusion Strategies, Modalities and Architectures." *Machines and Algorithms*, 4(3), 198–214, 2025.
- [7] R. Abdulrahman, A. Amjad, A. Jamil, S. Hussain, S. Ullah, A. H. Shehzad, W. Ahmad, A. A. Mansab, M. H. Akbar. "Bridging Lab-to-Clinic Deployment: Explainable, Offline Deep Learning for Alzheimer's MRI Analysis on Mobile Devices." *Spectrum of Engineering Sciences*, 3(12), 152–173, 2025.
- [8] M. Baig, M. A. Imtiaz, H. Revel, A. Jamil, S. Hussain, A. Amjad, W. Ahmad, A. A. Mansab, M. H. Akbar. "Fast Multi-Scale Generalization Bounds for Tool-Augmented Reasoning in Large Language Models Under Heavy-Tailed Loss Regimes." *Spectrum of Engineering Sciences*, 3(11), 923–936, 2025.
- [9] M. Khan, S. Hussain, A. Amjad, A. Jamil, M. Azhar, M. Usman, W. Ahmad, A. A. Mansab, M. H. Akbar. "Enhancing Human-Centric Interaction: A Deep Learning Approach for Robust Facial Expression Recognition and Intensity Estimation." *Spectrum of Engineering Sciences*, 3(10), 1976–1985, 2025.
- [10] S. Hussain, M. Jamil, I. Shehzad, A. Sarfraz. "Integrating Formal Methods into Cloud Based Learning Management System Security: A Lightweight Formal Development Framework." *Spectrum of Engineering Sciences*, 3(9), 1587–1595, 2025.
- [11] A. Jamil, A. Amjad, S. Hussain, M. Usman, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "Multimodal Fusion of MRI and Genomic Data Using Transformer Networks for Alzheimer's Prediction." *Spectrum of Engineering Sciences*, 3(9), 1659–1673, 2025.
- [12] A. Amjad, M. Usman, A. Jamil, S. Hussain, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "Explainable AI Techniques for Improving Trust in Deep Learning Models." *Spectrum of Engineering Sciences*, 3(8), 1464–1473, 2025.
- [13] M. Arman, E. Sabir, S. Hussain, A. Naeem, M. U. Ahmad, M. Khan, A. Amjad, A. Jamil, N. P. Imran, M. Usman, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "RiskFormer: Towards Transparent AI in Mental Health — An Explainable Transformer Model for Suicide Risk Detection from Digital Language." *Spectrum of Engineering Sciences*, 3(7), 1693–1700, 2025.

- [14] S. Hussain, M. H. Revel, M. A. Imtiaz, A. Jamil, A. Amjad, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "Sub-Quadratic Token Mixing via Spectral Filtering and Polynomial Functional Calculus." *Spectrum of Engineering Sciences*, 3(6), 1233–1241, 2025.
- [15] S. Hussain, M. A. Imtiaz, H. Revel, A. Amjad, A. Jamil, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "From Classical Vision to Deep Learning: A Survey of Computer Vision Methods in Robotics." *Spectrum of Engineering Sciences*, 3(5), 977–990, 2025.
- [16] S. Hussain, M. Arman, A. Amjad, A. Jamil, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "A Trust-Aware Transformer Architecture with Uncertainty Estimation for High-Stakes Language-Based Decision Systems." *Spectrum of Engineering Sciences*, 3(4), 1020–1027, 2025.
- [17] S. Hussain, M. Usman, A. Jamil, A. Amjad, N. P. Imran, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "LLM-Based Transformer Frameworks for Scalable and Trustworthy Intelligent Systems." *Spectrum of Engineering Sciences*, 3(3), 703–718, 2025.
- [18] S. Hussain, A. Jamil, A. Amjad, N. P. Imran, W. Ahmad, A. A. Mansab, M. H. Akbar, M. Waqas. "Deep Transformer Architectures for Early Detection of Mental Health Disorders from Multimodal Data." *Spectrum of Engineering Sciences*, 3(2), 959–969, 2025.
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- [20] M. Jamil, S. Hussain, M. Farhan, Y. Abbas, I. Shehzad. "AI-Driven Pedagogy: Transforming the Role of Educators and Learners." *Educational Research and Innovation*, 5(3), 51–65, 2025.
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- [23] R. A. Bakar, S. Hussain, S. Javed. "PRIM-MST: An Algorithm for Designing and Optimizing Local Area Network Planning." *International Journal of Computer Science & Network Security*, 97–104, 2024.
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- [25] R. Abu Bakar, X. Huang, M. S. Javed, S. Hussain, M. F. Majeed. "An Intelligent Agent-Based Detection System for DDoS Attacks Using Automatic Feature Extraction and Selection." *Sensors*, 23(6), 3333, 2023.
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- [38] Z. Iqbal, M. Khan, A. Ahmed, M. Hussain, M. Y. Malik, S. Hussain. "Thermal Enhancement in the Mixed Convective Flow of Unsteady Carreau Nanofluid with Slip Conditions: A Numerical Study." *Advances in Mechanical Engineering*, 13(8), 2021.
- [39] M. M. Hussain, A. Rehman, S. Nadeem, M. Y. Malik, A. Issakhov, L. Sarwar, S. Hussain. "A Combined Convection Carreau–Yasuda Nanofluid Model Over a Convective Heated Surface Near a Stagnation Point: A Numerical Study." *Mathematical Problems in Engineering*, 2021, 6665743, 2021.
- [40] S. Hussain, F. Ahmad, H. Ayed, M. Y. Malik, H. Waqas, M. M. Al-Sawalha, S. Hussain. "Combined Magnetic and Porosity Effects on Flow of Time-Dependent Tangent Hyperbolic Fluid with Nanoparticles and Motile Gyrotactic Microorganism Past a Wedge with Second-Order Slip." *Case Studies in Thermal Engineering*, 26, 100962, 2021.
- [41] S. Fatima, S. Hussain, R. A. Bakar. "An Efficient Secure Auditing Framework for Big Data Storage in Cloud Computing Environment." *International Journal of Computing and Digital Systems*, 10(1), 2021.
- [42] M. Irfan et al.. "Role of Hybrid Deep Neural Networks (HDNNs), Computed Tomography, and Chest X-Rays for the Detection of COVID-19." *International Journal of Environmental Research and Public Health*, 18(6), 3056, 2021.
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- [44] U. Arif, M. Nawaz, S. Rana, I. H. Qureshi, Y. Elmasry, S. Hussain. "Influence of Chemical Reaction on Mass Transport in Yield Stress Exhibiting Flow Regime." *Theoretical Foundations of Chemical Engineering*, 54(6), 1327–1339, 2020.
- [45] Z. H. Qaisar et al.. "Efficient Content-Based Image Retrieval." *Electronics*, 9(11), 1886, 2020.
- [46] Z. H. Qaisar et al.. "Effective Beamforming Technique Amid Optimal Value for Wireless Communication." *Electronics*, 9(11), 1869, 2020.
- [47] Z. Safdar et al.. "The Role of Roman Urdu in Multilingual Information Retrieval: A Regional Study." *The Journal of Academic Librarianship*, 46(6), 102258, 2020.
- [48] S. Hussain et al.. "Improving Scrum Model Using Inclusion Information Security Practices Through Information Security Master and Backlog Framework." *International Journal of Computer Science and Network Security*, 20(6), 99–111, 2020.
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- [50] S. Nasim et al.. "An Energy Efficient Base Stations Optimization Scheme for Mobile Wireless Sensor Networks Enabled IoTs." *International Journal of Computer Science and Network Security*, 20(10), 65–78, 2020.
- [51] T. Bashir, K. Asghar, M. Saddique, S. Hussain, I. U. Haq. "Enhancement of Fundus Images for Diagnosing Diabetic Retinopathy Using B-Spline." *International Journal of Advanced Computer Science and Applications*, 11, 233–239, 2020.
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- [53] N. Akhtar, S. Hussain. "Formal Modeling of a Mail Transport System Based on Multi-Agent System-of-Systems." *Journal of Information Communication Technologies and Robotic Applications*, 10(1), 68–79, 2019.
- [54] A. Jabbar, S. ul Islam, S. Hussain, A. Akhunzada, M. Ilahi. "A Comparative Review of Urdu Stemmers: Approaches and Challenges." *Computer Science Review*, 34, 100195, 2019.
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- [57] F. Saeed, S. Hussain, Z. U. Haq, R. Sultan. "Interactive Case Recognition Using Forensic Techniques." *International Journal of Computer Science and Information Security*, 15(5), 123–126, 2017.
- [58] S. Hussain, M. R. Faheem. "Separation of Veins and Arteries for Estimating Hypertensive Retinopathy in Fundus Images." *Biomedical Research and Therapy*, 3(6), 27, 2016.
- [59] G. Rasool, M. Khan, S. Hussain. "A Systematic Literature Review on Mobile Games Design Patterns." *Science International (Lahore)*, 27(2), 1365–1372, 2015.
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- [62] M. P. Baloch, S. Qadri, S. Hussain, S. Ahmad, A. B. Siddique, F. Azam, S. Sahiwal. "Comparative Study of Risk Management in Centralized and Distributed Software Development Environment." *Science International (Lahore)*, 26(4), 1523–1528, 2014.
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CONFERENCE PUBLICATIONS (8)

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- [4] S. Fatima, S. Hussain, B. U. Din, N. Shehzadi, W. Sajjad, R. Ali. "A Multi-Layer Blockchain Based Framework for Internet of Things." *2nd International Conference on Emerging Trends in Electrical, Control, and Telecommunication Engineering (ETECTE)*. IEEE, pp. 1–6, 2023.
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REFERENCES

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