Dr. Abha Sunil Khandelwal

FORMER HEAD | DEPARTMENT OF COMPUTER SCIENCE
Hislop College, Nagpur, Maharashtra, India · Founder, Association of All Computer Science Teachers (AACST)

PROFESSIONAL SUMMARY

Dr. Abha Sunil Khandelwal is a distinguished academic leader, researcher, educator and science communicator with more than 33 years of excellence in higher education. She is the retired Head of the Department of Computer Science, Hislop College, Nagpur (affiliated to RTM Nagpur University), and the Founder of the Association of All Computer Science Teachers (AACST), a national platform for interdisciplinary education, research, innovation and professional development. Her work bridges computing, education and emerging technologies, with recent research in AI-assisted quantum pedagogy, quantum cryptography and machine learning, and a strong commitment to conceptual understanding, critical thinking and the responsible use of AI in teaching and research.

ACADEMIC QUALIFICATIONS

- Ph.D. in Computer Science.
- Ph.D. in Business Management.

ACADEMIC POSITIONS AND LEADERSHIP

- Former Head, Department of Computer Science, Hislop College, Nagpur, Maharashtra, India (affiliated to RTM Nagpur University).
- Founder, Association of All Computer Science Teachers (AACST), Nagpur.
- Member, Board of Studies in Computer Science, Rashtrasant Tukadoji Maharaj Nagpur University (RTMNU), for over three decades.

RESEARCH AREAS AND SPECIALISATION

- Artificial Intelligence and Machine Learning
- Quantum Computing and Quantum Pedagogy
- Quantum Cryptography and Quantum Key Distribution (QKD)
- Cyber Security
- Computational Physics and Physics Education
- Data Science and Data Analytics
- AI in Education and Intelligent Tutoring Systems
- Computational Thinking, STEM Education and Design Thinking
- Software Engineering and Human–Computer Interaction
- Educational Technology and Digital Pedagogy

RESEARCH CONTRIBUTIONS

- **Quantum pedagogy:** Proposed the Quantum Pedagogical Framework for Learning with AI Assistance (QPF-AI), which integrates adaptive AI, interactive simulations and cognitive learning strategies to improve students' conceptual understanding of quantum computing.
- **Quantum cryptography:** Comparative analysis of BB84 and entanglement-based Quantum Key Distribution protocols under noisy channels, examining error tolerance, quantum bit error rates and practical implementation challenges in secure quantum communication.
- **Artificial intelligence and machine learning:** Research on credit card fraud detection comparing Decision Tree, Random Forest and hybrid (RF+DT) models to improve detection accuracy and reliability in financial systems.
- **Interdisciplinary computing:** Research integrating Computer Science with Physics, Mathematics, Biology and Management Sciences, and AI-driven innovation in teaching and learning.

SELECTED PUBLICATIONS

- "AI-Assisted Quantum Pedagogy: Redefining Cognition Through Intelligent Mediation and Quantum Reasoning," Research Hub – International Peer-Reviewed Multidisciplinary E-Journal (Special Issue: International Conference on Artificial Intelligence & the Future of Society).
- "Comparative Analysis of Quantum Cryptographic Protocols in Noisy Channels: BB84 vs. Entanglement-Based Protocols," International Journal of Advances and Applications in Convergent Studies & Transdisciplinarity (IJ-AACST).
- "Credit Card Fraud Detection Using Machine Learning," International Journal of Advances and Applications in Convergent Studies & Transdisciplinarity (IJ-AACST).

RESEARCH OUTPUT AND ACADEMIC CONTRIBUTIONS

- Published 40+ peer-reviewed research papers in national and international journals and conference proceedings.
- Research supervisor for doctoral scholars.
- Principal Investigator of a UGC-sponsored research project.
- More than 33 years of teaching, research and academic leadership in higher education.

ACADEMIC LEADERSHIP AND PROFESSIONAL SERVICE

- **Founder, AACST:** Promoting national-level collaboration among educators, researchers and innovators.
- **Board of Studies in Computer Science, RTM Nagpur University:** Served for over three decades, contributing to curriculum design, academic reforms and quality enhancement.
- **Conferences and programmes:** Chief Patron, Advisory Committee Member, Session Chair, Convener and Resource Person for numerous national and international conferences, workshops, faculty development programmes and research initiatives.
- **Advisory Committee Member:** International Journal of Advances and Applications in Convergent Studies & Transdisciplinarity (IJ-AACST).
- **Editorial and review roles:** Invited Reviewer and Editorial Advisory Member for national and international journals and conferences.
- Life Member, Computer Society of India (CSI), Mumbai.
- Life Member, Association of All Computer Science Teachers (AACST).

SCIENCE COMMUNICATION AND EDUCATIONAL INNOVATION

- Creator of the educational platform **@drabhakhandelwal**, delivering lectures, tutorials and science communication content on Artificial Intelligence, Quantum Technologies, Computational Physics, Cyber Security and emerging computing disciplines.
- Advocate of technology-enabled learning, interdisciplinary education and scientific temper through accessible digital knowledge dissemination.

PROFESSIONAL VISION

Driven by the belief that the future of education lies at the intersection of disciplines, Dr. Khandelwal is committed to advancing research excellence, ethical innovation, academic leadership and global collaboration, while empowering educators and learners to embrace the next generation of scientific and technological advancements.

RESEARCH PROFILE

- ORCID: https://orcid.org/0009-0008-0756-0496
- AACST (Founder): https://www.aacst.org
- YouTube: https://www.youtube.com/@FounderAACSTDrAbhaKhandelwal
- Educational Platform: @drabhakhandelwal

CONTACT DETAILS

- Email: info@aacst.org (AACST)
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Profile references: Academic profile of Dr. Abha Sunil Khandelwal; ORCID record 0009-0008-0756-0496; and AACST website. Publication and profile details are presented as recorded in these sources.