Prof. Dr. Muhammad Mubashir Khan

(HEC Approved PhD Supervisor)

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Objective

To contribute my knowledge, experience and expertise for academic and research excellence with special emphasis on modern computing applications and the cutting-edge technologies.

Professional Experience

Director **July 2023 to date**

Center for Quantum Technologies, NED University of Engineering & Technology, Karachi Pakistan.

Professor & Chairman **January 2022 to date**

Department of Computer Science & IT NED University of Engineering & Technology, Karachi Pakistan.

Associate Professor **August 2011 to January 2022**

Department of Computer Science & IT NED University of Engineering & Technology, Karachi Pakistan.

Postdoctoral Fellow & Associate Professor (Visiting) **November 2015 to August 2016**

Postdoctoral Researcher, Quantum Information Group, University of Leeds, United Kingdom.

Assistant Professor **August 2005 to August 2011**

Department of Computer Science & IT NED University of Engineering & Technology, Karachi Pakistan.

Lecturer **August 2002 to August 2005**

Department of Computer Science & IT NED University of Engineering & Technology, Karachi Pakistan.

Education

Post-doctorate (Quantum Information) **November 2016**

From Quantum Information Group, University of Leeds, UK

PhD in Computer Science **April 2011**

From School of Computing, University of Leeds, UK
Thesis title: High Error-Rate Quantum Key Distribution: Novel Protocols with Improved Eavesdropping Detection.

Masters (by research) in Computer Science & IT **December 2005**

From Department of Computer Science & IT, NED University of Engineering & Technology, Karachi, with the thesis title: Effects of Quantum Computing on Cryptographic Hash Functions.

M.Sc. Hons (Telecommunications) August 2001 (2nd Position, 3.75 CGPA)

Institute of Information Technology, University of Sindh, Jamshoro, Pakistan.

B.Sc. Hons (Telecommunications) December 1999 (3rd Position, 3.49 CGPA)

Institute of Information Technology, University of Sindh, Jamshoro, Pakistan.

Selected Publications

Journal Papers

1. Zafar, R., Kamran, M., Malik, T. et al. Randomness from radiation: evaluation and analysis of radiation-based random number generators. Eur. Phys. J. Plus 140, 463 (2025). JCR IF: 2.8 https://doi.org/10.1140/epjp/s13360-025-06428-4
2. Muhammad Kamran, Muhammad Mubashir Khan, and Tahir Malik, "Induced turbulence in the quantum channel of high dimensional QKD system using structured light". Appl. Phys. B 130, 56 (2024). JCR IF: 2.1 https://doi.org/10.1007/s00340-024-08195-z
3. Muhammad Hassan Nasir, Junaid Arshad, and Muhammad Mubashir Khan. "Collaborative Device-level Botnet Detection for Internet of Things." Computers & Security (2023): 103172. JCR IF: 5.1 (Accepted on 2nd March 2023). https://doi.org/10.1016/j.cose.2023.103172
4. Anum Atique Paracha, Junaid Arshad, Muhammad Mubashir Khan; "S.U.S. You're SUS!—Identifying influencer hackers on dark web social networks", Computers and Electrical Engineering, Volume 107, Feb 2023, 108627. JCR, IF 4.885. https://doi.org/10.1016/j.compeleceng.2023.108627
5. Khan, Muhammad Mubashir, Muhammad Faraz Hyder, Shariq Mahmood Khan, Junaid Arshad, and Muhammad M. Khan. "Ransomware prevention using moving target defense based approach." Concurrency and Computation: Practice and Experience: e7592. https://doi.org/10.1002/cpe.7592
6. Muhammad Najmul Islam Farooqui, Junaid Arshad, Muhammad Mubashir Khan, A Layered Approach to Threat Modeling for 5G-based Systems, Special Issue "Security and Privacy in Blockchain/IoT, Electronics, MDPI. JCR IF: 2.397 (June 8, 2022). https://www.mdpi.com/2079-9292/11/12/1819
7. Sidrah Abdullah, Muhammad Mubashir Khan, Junaid Arshad, "PRISED-Tangle: A Privacy-aware Framework for Smart Healthcare Data Sharing Using IOTA Tangle", Complex & Intelligent Systems (Special issue: Advances in Cyber Security in Cyber-Physical Systems) January 2022. JCR IF: 5.277 https://doi.org/10.1007/s40747-021-00610-8
8. Muhammad Hassan Nasir, Salman Ahmed Khan, Muhammad Mubashir Khan, "Swarm Intelligence Inspired Intrusion Detection Systems - A Systematic Literature Review", Computer Networks, Elsevier Vol 205 (2022): 108217. JCR IF: 4.474 (3 Jan 2022) https://doi.org/10.1016/j.comnet.2021.108708
9. Muhammad KAMRAN, Tahir MALIK, Muhammad Mubashir KHAN "Higher-dimension QKD system error rate evaluation by integrating Intercept-Resend Attack" International Journal of Quantum Information. 2150030 JCR IF: 1.176. https://doi.org/10.1142/S0219749921500301
10. Muhammad Hassan Nasir, Junaid Arshad, Muhammad Mubashir Khan, Mahawish Fatima, Khaled Salah, Raja Jayaraman, "Scalable Blockchains - A Systematic Review", Future Generation Computer Systems (FGCS), Volume 126, Pages 136-162, JCR IF: 7.18 https://doi.org/10.1016/j.future.2021.07.035
11. M. Najmul Islam Farooqui , Junaid Arshad , Muhammad Mubashir Khan, "A bibliometric approach to quantitatively assess current research trends in 5G security", Library Hi Tech, Emerald Publishing Limited. 4th August 2021. JCR IF: 1.218 https://doi.org/10.1108/LHT-04-2021-0133
12. Ammar Ahmed Khan, Muhammad Mubashir Khan, Kashif Mehboob Khan, Junaid Arshad, and Farhan Ahmad. "A blockchain-based decentralized machine learning framework for collaborative intrusion detection within UAVs." Computer Networks, Elsevier Vol 196 (2021): 108217. JCR IF: 3.111 https://doi.org/10.1016/j.comnet.2021.108217
13. Saadia Arshad, Junaid Arshad, Muhammad Mubashir Khan, Simon Parkinson, Analysis of security and privacy challenges for DNA-genomics tools and databases, Journal of Biomedical Informatics, Elsevier. 18th July 2021, Vol. 119, 103815. JCR IF: 3.526 https://doi.org/10.1016/j.jbi.2021.103815

14. Usama Ahsan, Muhammad Mubashir KHAN, Asad ARFEEN, Khadija AZAM "Security analysis of KXB10 QKD protocol with higher-dimensional quantum states" International Journal of Quantum Information, World Scientific, Vol. 18, No. 8 (2020) 2150005, March 2021. JCR IF: 1.176 https://doi.org/10.1142/S0219749921500052
15. Muhammad KAMRAN, Muhammad Mubashir KHAN, Tahir MALIK, Asad ARFEEN "Quantum key distribution over free space optic (FSO) channel using higher order Gaussian beam spatial modes" Turk J Elec Eng & Comp Sci, Vol. 28 No. 6, (2020), 3335-3351. JCR IF: 0.7 https://doi.org/10.3906/elk-2005-49
16. M. Najam-ul-Islam Farooqui, Muhammad Mubashir Khan, Junaid Arshad, Omair Shafiq "An empirical investigation of performance challenges within context-aware content sharing for vehicular ad hoc networks", Special Issue: Recent Advances on the Emerging Technologies for Connected Vehicles in Smart Cities, Transactions on Emerging Telecommunications Technologies. 24 October 2020. JCR, IF 1.594 https://doi.org/10.1002/ett.4157
17. Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan, "Empirical Analysis of Transaction Malleability within Blockchain-based e-Voting", Computers & Security, Vol. 100, pages: 102081, 2021. JCR, IF 3.062 https://doi.org/10.1016/j.cose.2020.102081
18. Muhammad Mubashir KHAN, Asad ARFEEN, Usama AHSAN, "Analysis of achievable distances of BB84 and KMB09 QKD protocols" International Journal of Quantum Information, Vol. 18, Issue 06, Article No. 2050033, 26 Nov. 2020. JCR IF: 1.176 https://doi.org/10.1142/S0219749920500331
19. Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan, "A Simulation and Analysis of Transaction Malleability Attack in Blockchain", Computers and Electrical Engineering, Volume 83, May 2020, 106583. JCR, IF 2.189 https://doi.org/10.1016/j.compeleceng.2020.106583
20. Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan, "Investigating Performance Constraints for Blockchain-Based Secure e-Voting System", Future Generation Computer Systems (FGCS) Vol. 105, Page 13-26, April 2020. JCR, IF 5.768. https://doi.org/10.1016/j.future.2019.11.005
21. H Jawed, Z Ziad, MM Khan, M Asrar, "Anomaly Detection through Keystroke and Tap Dynamics implemented via Machine Learning Algorithms" Turk J Elec Eng & Comp Sci, Vol. 26 No. 4: 1698 – 1709, July 2018. JCR IF: 0.7. https://doi.org/10.3906/elk-1711-410
22. KHAN, M. M., MURPHY, M. & BEIGE, A. High error-rate quantum key distribution for long-distance communication. New Journal of Physics, 11, 063043, 2009. JCR, IF 3.773. https://doi.org/10.1088/1367-2630/11/6/063043
23. Humma Nargis Aleem, Mirza Mahmood Baig, Muhammad Mubashir Khan, Efficient Software Testing Technique based on Hybrid Database Approach. (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 10 No. 07, pp. 249-356, 2019.
24. Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan, "Secure Digital Voting System based on Blockchain Technology", International Journal of Electronic Government Research (IJEGR), Volume 14 No. 1, page 53-62, March 2018. (HEC Y Category).

Book Chapter

1. Khan K.M., Arshad J., Khan M.M., Nasir M.H. (2021) An Empirical Investigation of Blockchain Scalability. In: Rehman M.H.., Svetinovic D., Salah K., Damiani E. (eds) Trust Models for Next-Generation Blockchain Ecosystems. EAI/Springer Innovations in Communication and Computing. Springer, Cham. https://doi.org/10.1007/978-3-030-75107-4_5
2. Aryba Aslam, Muhammad Mubashir Khan, Junaid Arshad. A Comparative Study of Distributed Ledger Technologies - Blockchain vs. Hashgraph book chapter in Blockchain for Cybersecurity and Privacy: Architectures, Challenges, and Applications. CRC Press Taylor & Francis Group, June 8, 2020. ISBN 9780367343101

Conference Papers

1. Kamran, Muhammad, Muhammad Mubashir Khan, and Tahir Malik. "Decoy state HD QKD system for secure optical communication." In 2021 International Conference on Cyber Warfare and Security (ICCWS), pp. 87-92. IEEE, 2021. https://doi.org/10.1109/ICCWS53234.2021.9702961
2. Junaid Arshad, Mohammad Abdellatif, Muhammad Khan and Muhammad Azad, "A Novel Framework for Collaborative Intrusion Detection for M2M Networks" The International Conference

on Information and Communication Systems (ICICS 2018) April 3-5 2018.

3. CLARK, L. A., STOKES, A., KHAN, M. M., WANG, G. and BEIGE, A., Quantum-Enhanced Metrology without Entanglement based on Optical Cavities with Feedback, The 5th International Conference on Photonics, Optics and Laser Technology (PHOTOPTICS 2017). Porto, Portugal, 27th Feb to 1st March 2017.
4. J. A. SHAMSI, R. H. NIAZI, T. WASEEM; KHAN, M. M., Signature-based detection of privilege-escalation attacks on Android, 2015 Conference on Information Assurance and Cyber Security (CIACS), pp. 44--49, 2015, Published by IEEE.

Achievements

- Designed Consolidated Curriculum of BS Computer Science with four specializations (AI, Data Science, Cyber Security, Gaming & Animation)
- Established Center for Quantum Technologies at NEDUET
- Won research funding for National Centre for Cyber Security (NCCS) Rs. 118 m as Co-Principal Investigator
- Best Researcher Award 2021 NEDUET
- Best Researcher Award 2020 NEDUET
- Best Teacher Award of 2015 from NED University Alumni Association USA.
- Best Teacher Award of 2017 from NED University Alumni Association USA.
- Received Postdoctoral Fellowship from HEC Pakistan for Fall 2015.
- Collaboration with Microsoft under Curriculum Integration Program.

Other Responsibilities

- CoPI National Center for Cyber Security, NED UET.
- Focal person of NED Huawei Authorized Information and Network Academy (HAINA).
- Postgraduate Coordinator, Department of Computer Science & IT, NEDUET.
- Supervising several PhD and MS research projects.

Expert Reviewer of Journals / Conferences

Program Committee (PC) Member:

- Conference on Information Assurance and Cyber Security 2015 (CIACS-2015), technically co-sponsorship of IEEE Computer Society and IEEE Communications Society, Organised by Military College of Signals (MCS), National University of Science & Technology (NUST). 18 December 2015.
- 2nd National Conference on Information Assurance 2013 (NCIA-2013), technically co-sponsorship of IEEE Computer Society and IEEE Communications Society, Organised by Military College of Signals (MCS), National University of Science & Technology (NUST). 11-12 December 2013.

Reviewer (Journals)

- Security and Communication Networks.
- Computer Communications (Elsevier).
- NED University Journal of Research - Applied Sciences. Recognized by HEC in "X" Category.

Reviewer (Conferences)

- Conference on Information Assurance and Cyber Security 2014 (CIACS-2014) to be held on 12-13 June 2014 at the Military College of Signals (MCS), Rawalpindi, Pakistan. 12-14 June 2014
- 3rd IEEE International Conference on Computer, Control & Communication (IEEE-IC4) organised by Pakistan Navy Engineering College (NUST), Karachi, in the collaboration with IEEE and Pakistan Council of Scientific and Industrial Research (PCSIR).
- 1st International Conference on Modern Communication & Computing Technologies (MCCT-2014), Sponsored by Pakistan Science Foundation & Higher Education Commission Pakistan, Organized by Quaid-e-Awam University of Engineering Science & Technology (QUEST).

Workshops (Invited talks / Presentations)

- Keynote Speaker in 1st International Conference on Emerging Trends in Information and Engineering Technologies (ICETIET), 24th and 25th March, 2022.
- Organized Seminar on ATM Threats and its Countermeasures in NED University in collaboration with Digital Arrays Pvt. Ltd. February 2, 2018.
- Conducted a workshop on 'Web Technologies for Academic Professionals' organized by QEC - NEDUET.
- Presentation at the Seventh Annual Canadian Quantum Information Students' Conference 2010 (CQISC'10), July 12-16, 2010, University of Calgary, Alberta, Canada.
- The Workshop on Quantum Algorithms, Computational Models, and Foundations of Quantum Mechanics, held from July 23 to July 25, 2010 at the University of British Columbia, Vancouver, Canada.
- The 10th Canadian Summer School on quantum information, held from July 17 to July 30, 2010 at the University of British Columbia, Vancouver, Canada.
- M. M. Khan, A. Beige, J. Xu. Quantum Key Distribution with High Eavesdropping Error-rate using Two-Dimensional Photon States. Fifth Conference on the Theory of Quantum Computation, Communication and Cryptography, Leeds, UK April 2010.
- M. M. Khan, Jie Xu, Applications of QKD Networks for High Performance Distributed Computing, SECOQC, Vienna, October 2008.
- M. M. Khan, Jie Xu, Applications of Quantum Key Distribution, PhD Students Workshop, School of Computing, University of Leeds, UK. (First Prize)

Courses Taught

- Cyber Crimes and Security (Postgraduate level course)
- Information Privacy & Security (Postgraduate level course)
- Quantum Computing & Cryptography (Postgraduate level course)
- Wireless & Mobile Communication (Postgraduate level course)
- Scientific Computing (Using MATLAB) (Postgraduate level course)
- Software Engineering (Undergrad level course)
- Design & Analysis of Algorithms (Undergraduate level course)
- Network and Information Security (Undergrad level course)
- Wireless Networks & Mobile Computing (Undergrad level course)
- Assembly Language programming (Undergrad level course)
- Object Oriented Programming (Undergrad level course)

Research Supervision **(selected projects)**

- PhD Project: Investigating Slice-level Side-channel Attacks within 5G Based Services
- PhD Project: A Trustworthy Swarm Inspired Intrusion Detection System for Botnet Attacks within IoT
- PhD Project: Practical Quantum Key Distribution with Higher Dimension Protocol
- PhD Project: Investigating Slice-level Side-channel Attacks within 5G Based Services
- PhD Project: A trustworthy Swarm-inspired IDS for Botnet Attacks within IoT
- PhD Project: Investigation and Countering Transaction Malleability Attacks in Blockchain Systems
- PhD Project: Efficient Software Testing based on Hybrid Hypothetical-Traditional Database
- MS Project: Android Malware Detection using Deep Learning
- MS Project: Real Time Dark Web Analyzer For Mitigating Zero Day Attack
- MS Project: Investigating the Threats and Possible Attacks on the Genomic-DNA Data: The Need for Cyberbiosecurity
- MS Project: File-less malware detection in digital forensics
- MS Project: Implementation of Blockchain on IoT
- MS Project: Decentralised Machine Learning on Blockchain
- MS Project: Blockchain: A way to preserve the privacy and security of Medical Records
- MS Project: Analysis of Routing Schemes in Quantum Key Distribution Networks
- MS Project: Comparison of Blockchain & Hash graph
- MS Project: Comparative Analysis of QKD Protocols to Augment Eavesdropping Detection
- MS Project: Distance: A key challenge in Quantum Key Distribution

Other Projects

- Team Lead for the development of Blockchain-based Degree Verification System of NED UET.
- Developed software for Admission System of NED University of Engineering & Technology, Karachi.
- Developed software for Medical Center of NED University of Engineering & Technology, Karachi.
- Developed Campus Message System for NED University of Engineering & Technology, Karachi.
- Comparison among LINUX, WIN-2000 & Novell Netware Specific to network architecture. (B.Sc. (H) Thesis Project)
- Developed software (Global PC & Mobile Access Server) as M.Sc. (H) final year project. A web-based solution for accessing PCs remotely via Internet Web-Browsers & WAP Enabled Mobile Phones.

Personal Details

- Marital Status: Married
- Languages: English & Urdu (fluent), French (Novice)
- Hobbies: Traveling, Reading & Writing