BASIT SHAFIQ

ADDRESS AND PERSONAL DETAILS
Professor, Department of Computer Science
School of Science and Engineering
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EDUCATION

1/2002–8/2006	Ph.D. in Electrical and Computer Engineering, Purdue University, USA
8/1999–12/2001	M.S. in Electrical and Computer Engineering, Purdue University, USA
2/1995–2/1999	B.S. in Electronics Engineering, Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi, Pakistan.

RESEARCH INTERESTS

Security and privacy, services computing, cloud/edge computing, distributed systems, Blockchain

RESEARCH AND WORK EXPERIENCE

04/2025–present	Professor Lahore University of Management Sciences, Lahore, Pakistan.
01/2021–12/2023	Chair, Department of Computer Science Lahore University of Management Sciences, Lahore, Pakistan.
12/2015–03/2025	Associate Professor Lahore University of Management Sciences, Lahore, Pakistan.
12/2015-present	Visiting Research Fellow Rutgers Institute for Data Science, Learning, and Applications, Rutgers University, Newark NJ 07102
01/2011–11/2015	Assistant Professor Lahore University of Management Sciences, Lahore, Pakistan.
9/2006–12/2010	Research Assistant Professor Center for Information Management, Integration and Connectivity (CIMIC), Rutgers University, Newark NJ 07102
8/1999–5/2006	Graduate Research Assistant Purdue University, School of Electrical and Computer Engineering, West Lafayette, IN 47906

RESEARCH FUNDING

1. PI, “A Service-oriented Framework for Developing Personalized Care Plans for at-home Patients with Infectious Diseases,” HEC National Research program for Universities, PKR 4,882,800. July 2023 – June 2025.
2. PI from LUMS, “Rethinking Cybersecurity in Pakistan - Human factors' Essential Role (ReCyP:HER),” Saarland University through EU Erasmus+ CBHE Programme. EURO 158,605. January 15, 2021 – January 14, 2024. (Lead PI, Cornelius Konig, University of Saarland).

3. PI, "Developing Security-aware Distributed Applications in the Cloud and Edge Computing Environment," LUMS Faculty Initiative Fund, PKR 1,200,000, November 2020 – October 2021.
4. PI, "Dynamic Composition of Internet-centered Distributed Applications in the Cloud and Edge Computing Environment," LUMS Faculty Initiative Fund, PKR 960,000, February 2019 – January 2020.
5. Co-PI, "Distributed Cloud Computing Lab," HEC and Planning Commission. PKR 78,467,207. June 2018 – May 2021. (Ihsan Qazi, PI).
6. PI, "End-to-End Solution for Business Process Composition and Management," ICT-R&D Fund. PKR 12,764,045. November 2016 – October 2018.
7. PI, "Codec: Composition and Management of e-Government Processes in the Cloud of Public Services," Pakistan-US Science and Technology Cooperation Program, sponsored by USAID and HEC, $197,419, January 2016 – December 2018.
8. PI, "Information Sharing and Integration Framework for Emergency Management and Response," HEC National Research program for Universities, PKR 3,278,705, November 2015 – October 2017.
9. PI, "Codec: Composition and Management of e-Government Processes in the Cloud of Public Services," LUMS Faculty Initiative Fund, PKR 960,000, February 2015 – January 2016.
10. PI, "A Privacy-preserving Framework for Collaborative Business Process Composition," LUMS Faculty Initiative Fund, PKR 450,000, July 2013 – June 2014.
11. Co-PI, "Information Sharing across States' Incident Management Systems using UICDS," United States Army Armament Research, Development and Engineering Center (ARDEC), $498,431, October 2009 - October 2011. (Vijay Atluri, PI)
12. PI, "Workshop on Future Directions in Cyber-physical Systems Security," Department of Homeland Security Science and Technology Directorate, $77,592.80, July 2009.
13. Co-PI, "information Technology for Emergency mAnageMent (iTEAM)," Rutgers University Academic Excellence Fund, $40,000, July 2008 – June 2009. (Nabil R. Adam, PI)
14. Co-PI, "Technology Transfer: A Context Sensitive Alert Management System," NSF Supplement Grant extension to NSF Award IIS-0306838, $50,000, June 2008 – May 2009. (Nabil R. Adam, PI)
15. Co-PI, "Service-oriented Architecture Supporting Networks of Public Security," SAP Germany, $566,000, July 2007 – June 2009. (Nabil R. Adam, PI).
16. Co-PI, "Secure Agency Interoperation for Effective Data Mining in Border Control and Homeland Security Applications," NSF, September 2003 – August 2008, (Joined as Co-PI from September 2006) (Nabil R. Adam, PI)
17. Co-PI, "Improving Business Knowledge Management and Analysis through the Use of Semantic Web Services and RFID Technology", SAP Research Labs, $100,000, January 2007 - June 2007. (Nabil R. Adam, PI).

PUBLICATIONS

JOURNAL PAPERS
Published/Accepted

J1. H. Zafar, M. Ali, Z. Ahmad, M. Sarfraz, **B. Shafiq**, S. Shamail, A. Afzal, J. Vaidya, S. Raza, and A. Imran, "Sustainable Personalized Home Care for Pandemic Management: A Service-Oriented Approach," *ACM Digital Government: Research and Practice*, Vol 6, No. 3, August- September 2025. doi:10.1145/3724402.

J2. A. Akhtar, M. Barati, B. Shafiq, O. Rana, A. Afzal, J. Vaidya, and S. Shamail, "Blockchain based Auditable Access Control for Business Processes with Event Driven Policies," *IEEE Transactions on Dependable and Secure Computing*, vol. 21, no. 5, pp. 4699-4716, Sept.-Oct. 2024, doi: 10.1109/TDSC.2024.3356811.

J3. S. Amjad, A. Akhtar, M. Ali, A. Afzal, **B. Shafiq**, J. Vaidya, S. Shamail, and O. Rana, "Orchestration and Management of Adaptive IoT-Centric Distributed Applications," *IEEE Internet of Things Journal*, Vol. 11, No. 3, pp. 3779-3791, 1 Feb.1, 2024. doi: 10.1109/JIOT.2023.3306238.

J4. M. Zahid, **B. Shafiq**, J. Vaidya, A. Afzal, and S. Shamail, "Collaborative Business Process Fault Resolution in the Services Cloud," *IEEE Transactions on Services Computing*, vol. 16, no. 1, pp. 162-176, 1 Jan.-Feb. 2023.

J5. A. Elahraf, A. Afzal, A. Akhtar, **B. Shafiq**, J. Vaidya, S. Shamail, N. Adam, "A Framework for Dynamic Composition and Management of Emergency Response Processes," *IEEE Transactions on Services Computing*, vol. 15, no. 4, pp. 2018-2031, 1 July-Aug. 2022.

J6. A. Afzal, **B. Shafiq**, S. Shamail, A. Elahraf, J. Vaidya and N. Adam, "ASSEMBLE: Attribute, Structure and Semantics based Service Mapping Approach for Collaborative Business Process Development," *IEEE Transactions on Services Computing*, vol. 14, no. 2, pp. 371-385, 1 March-April 2021, doi: 10.1109/TSC.2018.2805346.

J7. A. Afzal, **B. Shafiq**, S. Shamail, and N. Adam, "Requirements Modeling of Web Services-based Business Processes," *Business Process Management Journal*, Vol. 26, No. 6, November 2020.

J8. R. Wieder, **B. Shafiq**, N. Adam, "Greater Survival Improvement in African American vs. Caucasian Women with Hormone Negative Breast Cancer," *Journal of Cancer*, Vol. 11, No. 10 (2020), Pages 2808-2820.

J9. H. Asif, T. Talukdar, J. Vaidya, **B. Shafiq**, and N. Adam, "Differentially Private Outlier Detection in a Collaborative Environment," *International Journal of Cooperative Information Systems* Vo. 27, No. 3. September 2018.

J10. **B. Shafiq**, S. Ghayyur, A. Masood, Z. Pervaiz, A. Almutairi, F. Khan, and A. Ghafoor, "Composability Verification of Multi-service Workflows in a Policy-Driven Cloud Computing Environment," *IEEE Transactions on Dependable and Secure Computing*, Vol. 14, No. 5 (2017), Pages 478-493.

J11. R. Wieder, **B. Shafiq**, N. Adam, "African American Race is an Independent Risk Factor in Survival from Initially Diagnosed Localized Breast Cancer," *Journal of Cancer*, Vol. 7, No. 12 (2016), Pages 1587-1598

J12. D. Lorenzi, S. Chun, J. Vaidya, **B. Shafiq**, V. Atluri, and N. Adam. "PEER: A Framework for Public Engagement in Emergency Response." *International Journal of E-Planning Research* (*IJEPR*), Vol. 4, No. 3 (2015): 29-46.

J13. J. Vaidya, **B. Shafiq**, W. Fan, D. Mehmood, and D. Lorenzi ,"A Random Decision Tree Framework for Privacy-preserving Data Minning," *IEEE Transactions on Dependable and Secure Computing*, Vol.11, No.5, pp.399,411, Sept.-Oct. 2014.

J14. D. Lorenzi, J. Vaidya, S. Chun, **B. Shafiq**, and V. Atluri, "Enhancing the Government Service Experience through QR Codes on Mobile Platforms," *Government Information Quarterly*, Volume 31, Issue 1, January 2014, Pages 6–16.

J15. N. Adam and **B. Shafiq**, and Robin Staffin "Spatial Computing and Social Media in the Context of Disaster Management," *IEEE Intelligent Systems*, Nov/Dec 2012.

J16. A. Paliwal, **B. Shafiq**, J. Vaidya, H. Xiong, and N. Adam, "Semantics Based Automated Service Discovery," *IEEE Transactions on Services Computing*, Vol. 5 No. 2, pp. 260-275, April/June 2012.

J17. X. He, J. Vaidya, **B. Shafiq**, and N. Adam, "Structure-Aware Graph Anonymization," *Web Intelligence and Agent Systems: An International Journal*, Vol. 10 No. 2, pp. 193 - 208, April, 2012, IOS Press, NL.

J18. **B. Shafiq**, V. Atluri, J. Vaidya, S. Chun, and G. Nabi, "Resource Sharing using UICDS Framework for Incident Management, " *Transforming Government: People, Process and Policy*, Vol. 6, No. 1, pp. 41 - 61, 2012.

J19. X. He, J. Vaidya, **B. Shafiq**, N. Adam, and T. White, "Privacy Preserving Integration of Health Care Data," *International Journal of Computational Models and Algorithms in Medicine*, Vol. 1, No. 2, April – June 2010, pp. 22-36.

J20. **B. Shafiq**, J. Joshi, E. Bertino, and A. Ghafoor, "Secure Interoperation in Multi-Domain Environment Employing RBAC Policies," *IEEE Transactions on Knowledge and Data Engineering*, Vol. 17, No. 11, November 2005, pp. 1557-1577.

J21. R. Bhatti, **B. Shafiq**, J. Joshi, E. Bertino, and A. Ghafoor, "X-GTRBAC Admin: A Decentralized Administration Model for Enterprise Wide Access Control," *ACM Transactions on Information and System Security*, Vol. 8, No. 4, pp. 388-423.

J22. R. Bhatti, **B. Shafiq**, M. Shehab, and A. Ghafoor, "Distributed Access Management in Multimedia IDCs," *IEEE Computer*, Vol. 38, No. 9, September 2005, pp. 60-69.

J23. **B. Shafiq***, H. Fahmi, S. Baqai, A. Khokhar, and A. Ghafoor, "Wireless Network Resource Management for Web-Based Multimedia Document Services," *IEEE Communication Magazine*, Vol. 41, No. 3, March 2003, pp. 138-145.

J24. J. Joshi, K. Li, H. Fahmi, **B. Shafiq**, and A. Ghafoor, "A Model for Secure Multimedia Document Database System in a Distributed Environment," *IEEE Transactions on Multimedia***,** Vol. 4, No. 2, June 2002, pp. 215-234.

CONFERENCE AND WORKSHOP PAPERS

C1. S. Amjad, A. Akhtar, M. Ali, **B. Shafiq**, S. Shamail, A. Afzal, and J. Vaidya, "Demo: Orchflow: Orchestration and Management of IoT-Centric Distributed Workflows," in the *Proceedings of the 44th IEEE International Conference on Distributed Computing Systems* (*ICDCS*), 23 July – 26 July 2024, Jersey City, New Jersey, USA.

C2. M. A. Zahid, A. Afzal, A. Akhtar, **B. Shafiq**, J. Vaidya and S. Shamail, "An Integrated Framework for Fault Resolution in Business Processes," Proceedings of the *IEEE International Conference on Web Services* (ICWS 2022), Barcelona, Spain, July 11 – 15, 2022.

C3. M. A. Zahid, **B. Shafiq**, A. Afzal, J. Vaidya and Shafay Shamail, "BP-DEBUG: A Fault Debugging and Resolution Tool for Business Processes," (Demo Paper), Proceedings of the 42nd *IEEE International Conference on Distributed Computing Systems* (ICDCS 2022), Bologna, Italy, July 10 – 13, 2022.

C4. A. Elahraf, A. Afzal, A. Akhtar, **B. Shafiq** and J. Vaidya, "A Service-oriented Framework for Developing Personalized Patient Care Plans for COVID-19," Proceedings of the *22nd Annual International Conference on Digital Government Research* (dgo 2021), Omaha, Nebraska, June 9 - 11, 2021.

C5. A. Akhtar, **B.Shafiq**, J. Vaidya, A. Afzal, S. Shamail, and O. Rana, "Blockchain Based Auditable Access Control for Distributed Business Processes," Proceedings of the *40th IEEE International Conference on Distributed Computing Systems* (ICDCS 2020) November 29 – December 1, 2020, Singapore.

C6. A. Afzal, A. Akhtar, M. A. Zahid, **B.Shafiq**, S. Shamail, A. Elahraf, J. Vaidya, and N. Adam, "BP-Com: A Service Mapping Tool for Rapid Development of Business Processes" (Demo Paper), Proceedings of the *40th IEEE International Conference on Distributed Computing Systems* (ICDCS 2020) November 29 – December 1, 2020, Singapore.

C7. M. Anam, **B. Shafiq**, S. Shamail, S. Chun, and N. Adam, "Discovering Events from Social Media for Emergency Planning," *Proceedings of the 20th Annual International Conference on Digital Government Research* (dgo '19), Dubai, UAE, June 18 - June 20, 2019.

C8. A. Affan, H. A. Nasir, **B. Shafiq**, and A. Muhammad. "Data Assimilation of Mobile Sensors in Hydrological Models of Unsteady Flow." IFAC-PapersOnLine 52, no. 23 (2019): 29-36.

C9. A. Afzal, **B. Shafiq**, S. Shamail, A. Elahraf, J. Vaidya, and N. Adam, "Emergency Response Plan Recommendation and Composition System (ERPRCS)," in *Proceedings of the 19th Annual International Conference on Digital Government Research* (dgo '18), Delft, The Netherlands, May 30 - June 01, 2018.

C10. A. Afzal, A. Akhtar, N. Ishfaq, B. **Shafiq**, S. Shamail, A. Elahraf, J. Vaidya, and N. Adam, "ASSEMBLE: A Collaborative Business Process Development Tool," in *40th International Conference on Software Engineering* (*ICSE*) 2018, poster track.

C11. J. Vaidya, **B. Shafiq**, M. Asani, N. Adam, X. Jiang, and L. Ohno-Machado, "A Scalable Privacy-preserving Data Generation Methodology for Exploratory Analysis," in *Proceedings of the AMIA 2017 Annual Symposium*, November 04 - 08, 2017, Washington DC, USA.

C12. H. Asif, J. Vaidya, **B. Shafiq** and N. Adam, "Secure and Efficient k-NN Queries," in Proceedings of the *32nd International Conference on ICT Systems Security and Privacy Protection* (*IFIP SEC 2017*).

C13. H. Asif, T. Talukdar, J. Vaidya, **B. Shafiq**, and N. Adam, "Collaborative Differentially Private Outlier Detection for Categorical Data," in *IEEE 2nd International Conference on Collaboration and Internet Computing* (CIC), November 2016. pp. 92-101.

C14. D. Ghosh, S. Chun, **B. Shafiq**, and N. Adam, "Big Data-based Smart City Platform: Real-Time Crime Analysis," in *Proceedings of the 17th International Digital Government Research Conference on Digital Government Research*. June 2016. pp. 58-66.

C15. J. Vaidya, **B. Shafiq**, V. Atluri, and D. Lorenzi, "A Framework for Policy Similarity Evaluation and Migration based on Change Detection," *9th International Conference on Network and System Security* (*NSS* 2015), November 3-5, 2015,New York City, USA.

C16. H. Irshaad[G], **B. Shafiq**, J. Vaidya, S. Shamail, and N. Adam, "Preserving Privacy in Collaborative Business Process Composition," *12th International Conference on Security and Cryptography* (*SECRYPT 2015*), Colmar, France, 20-22 July 2015. (Received best paper ward)

C17. D. Lorenzi, J. Vaidya, **B. Shafiq**, S. Chun, N. Vegesna, Z. Alzamil, N. Adam, S. Werner, and V. Atluri, "Utilizing Social Media to Improve Local Government Responsiveness," *15th International Digital Government Research Conference* (*dg.o* 2014).

C18. J. Vaidya, A. Basu, **B. Shafiq**, and Yuan Hong, "Differentially Private Naive Bayes Classification," *Proceedings of the 2013 IEEE/WIC/ACM International Conference on Web Intelligence* (*WI* 2013), 17-20 November 2013, Atlanta, GA, USA.

C19. J. Vaidya, **B. Shafiq**, D. Lorenzi, and N. Badar. "Incorporating Privacy into the Undergraduate Curriculum," In Proceedings of the *2013 Information Security Curriculum Development Conference* (*InfoSecCD'13*), ACM, 2013.

C20. D. Lorenzi, J. Vaidya, S. Chun, **B. Shafiq**, V. Naik, V. Atluri and N. Adam, "Community Based Emergency Response," *14th International Digital Government Research Conference* (*dg.o* 2013).

C21. J. Vaidya, **B. Shafiq**, X. Jiang, and L. Ohno-Machado, "Identifying Inference Attacks against Healthcare Data Repositories," AMIA Summit on Clinical Research Informatics (CRI). March 20-22, 2013 San Francisco, USA. (won The Clinical Research Informatics (CRI) Distinguished Paper Award).

C22. N. Badar, J. Vaidya, V. Atluri, and **B. Shafiq**, "Risk based Access Control using Classification," in Proceedings of the *5th Symposium on Configuration Analytics and Automation* (*SafeConfig* 2012), October 3 - 4, 2012, Baltimore, MD, USA.

C23. **B. Shafiq**, J. Vaidya, S. Chun, N. Badar, and N. Adam, "Secure Composition of Cascaded Web Services," in Proceedings of the *8th IEEE International Conference on Collaborative Computing: Networking, Applications and Worksharing* (*CollaborateCom* 2012), October 14–17, 2012 Pittsburgh, Pennsylvania, USA.

C24. X. He, J. Vaidya, **B. Shafiq**, and N. Adam, "Privacy Preserving Maximum-Flow Computation in Distributed Graphs," *IEEE International Conference on Information Privacy, Security, Risk and Trust* (*PASSAT 2012*). Amsterdam, Netherlands. September 2012.

C25. D. Mehmood, **B. Shafiq**, J. Vaidya, Y. Hong, N. Adam, and V. Atluri, "Privacy-preserving Subgraph Discovery", *26th Annual WG 11.3 Conference on Data and Applications Security and Privacy* (*DBSec*), July 11-13, 2012, Institut Mines-Telecom, Paris, France.

C26. **B. Shafiq**, J. Vaidya, A. Ghafoor, and E. Bertino, "A Framework for Verification and Optimal Reconfiguration of Event-driven Role Based Access Control Policies," *17th ACM Symposium on Access Control Models and Technologies* (*SACMAT*), Newark, NJ, USA, 2012.

C27. D. Lorenzi, J. Vaidya, S. Chun, **B. Shafiq**, G. Nabi, and V. Atluri, "Using QR Codes for Enhancing the Scope of Digital Government Services,"*13th Annual International Conference on Digital Government Research* (*dg.o 2012*), University of Maryland, College Park, MD, USA.

C28. Y. Hong, J. Vaidya H. Lu, and **B. Shafiq**, "Privacy-preserving Tabu Search for Distributed Graph Coloring," in Proceedings of the *3RD IEEE International Conference on Information Privacy, Security, Risk and Trust* (*PASSAT* '11), October 9-11, 2011, MIT, Boston, USA.

C29. V. Atluri, **B. Shafiq**, S. Chun, G. Nabi, and J. Vaidya, "UICDS-based Information Sharing among Emergency Response Application Systems, " in Proceedings of the *12th Annual International Conference on Digital Government Research* (*dg.o 2011*), June 12-15 2011, University of Maryland, College Park, MD, USA. (Demo Paper - Best Demo or Poster Award)

C30. X. He, J. Vaidya**, B. Shafiq**, N. Adam, and X. Lin, "Reachability Analysis in Privacy-Preserving Perturbed Graphs," *Proceedings of the 2010 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology*.

C31. J. Vaidya, V. Atluri, **B. Shafiq**, and N. Adam, "Privacy-preserving Trust Verification," ACM Symposium on Access Control Models and Technologies, 2010.

C32. V. Atluri, **B. Shafiq**, J. Vaidya, S. Chun, M. Trocchia, N. Adam, C. Doyle and L. Skelly, "Information Sharing Infrastructure for Pharmaceutical Supply Chain Management in Emergency Response,"in Proceedings of the 2010 *IEEE International Conference on Technologies for Homeland Security*, 8-10 November 2010, Westin Hotel, Waltham, MA.

C33. **B. Shafiq**, J. Vaidya, V. Atluri, and S. Chun, "UICDS Compliant Resource Management System for Emergency Response," *11th International Digital Government Research Conference* (*dg.o* 2010).

C34. V. Atluri, S. Chun, J. Ellenberger, **B. Shafiq**, and Jaideep Vaidya, "Integrated Resource and Logistics Management through Secure Information Sharing for Effective Emergency Response, " *Workshop on Emergency Management: Incident, Resource, and Supply Chain Management* (*EMWS*09), November 5-6, 2009.

C35. X.He, J. Vaidya, **B. Shafiq**, N. Adam, and V. Atluri, "Preserving Privacy in Social Networks: A Structure-Aware Approach," *Proceedings of the 2009 IEEE/WIC/ACM International Conference on Web Intelligence*.

C36. X. He, J. Vaidya, **B. Shafiq**, and N. Adam, "Efficient Privacy-Preserving Link Discovery," 13th *Pacific-Asia Conference on Knowledge Discovery and Data Mining* (*PAKDD*-09).

C37. X. He, **B. Shafiq**, J. Vaidya, and N. Adam, "Privacy-Preserving Link Discovery," in *Proceedings of the 23rd Annual ACM Symposium on Applied Computing, Data Mining Track*, March 16-20, 2008, Fortaleza, Ceara, Brazil.

C38. N. Adam, V. Atluri, S. Chun, J.Ellenberger, **B. Shafiq**, J. Vaidya, and H. Xiong, "Secure Information Sharing and Analysis for Effective Emergency Management," in *Proceedings of the 9th Annual International Conference on Digital Government Research*, Montreal, Canada, May 2008.

C39. N. Adam, T. White, **B. Shafiq**, and J. Vaidya, "Privacy Preserving Integration of Health Care Data," AMIA 2007 Annual Symposium.

C40. A. Paliwal, N. Adam and **B. Shafiq**, "Policy based Web Service Orchestration and Goal Reachability Analysis using HMSC and CP Nets," in *Proceedings of 9th IEEE Conference on E-Commerce Technology (CEC' 07) and the 4th IEEE Conference on Enterprise Computing, E-Commerce and E-Services (EEE ' 07)* , July 2007.

C41. N. Adam, V. Janeja, A. Paliwal, **B. Shafiq**, C. Ulmer, V. Gersabeck, A. Hardy, Bornhoevd, and J. Schaper, "An Approach for discovering and handling crisis in a service-oriented environment," in *Proceedings of the IEEE International Conference on Intelligence and Security Informatics 2007* (*ISI 2007*) , May 2007.

C42. N. Adam, A. Kozanoglu, A. Paliwal, and **B. Shafiq**, "Secure Information Sharing in a Virtual Multi-agency Team Environment," in *Proceedings of the Second International Workshop on Security and Trust Management* (*STM'06*), Hamburg, Germany, September 2006.

C43. **B. Shafiq**, A. Samuel, E. Bertino, and A. Ghafoor, "A Technique for Optimal Adaptation of Time-Dependent Workflows with Security Constraints," in *Proceedings of the IEEE International Conference on Data Engineering*, Atlanta, GA, April 2006, (short paper).

C44. **B. Shafiq**, A. Samuel, and H. Ghafoor, "A GTRBAC Based System for Dynamic Workflow Composition and Management," in *Proceedings of the IEEE International Symposium on Object Oriented Real-time Distributed Computing*, Seattle, WA, May 2005.

C45. **B. Shafiq**, E. Bertino, and A. Ghafoor, "Access Control Management in a Distributed Environment Supporting Dynamic Collaboration," in *Proceedings of the ACM Workshop on Digital Identity Management*, Fairfax VA, November 2005.

C46. **B. Shafiq**, A. Masood, J. Joshi, and A. Ghafoor, "A Role-based Access Control Policy Verification Framework for Real-Time Systems," in *Proceedings of the IEEE International Workshop on Object-oriented Real-Time Dependable Systems*, Sedona AZ, February 2005.

C47. W. Sheikh, **B. Shafiq**, R. Paul, and A. Ghafoor, " Provision of Multimedia Services in a Mobile Ad Hoc Network," in *Proceedings of the* IEEE International Workshop on Object-oriented Real-Time Dependable Systems, October 2003, pp. 87-93.

C48. J. Joshi, E. Bertino, B. Shafiq, and A. Ghafoor, "Dependencies and Separation of Duty Constraints in GTRBAC", in Proceedings of the ACM Symposium on Access Control Models and Technologies, Como, Italy, June 2-3, 2003.

C49. H. Fahmi, M. Latif, **B. Shafiq**, R. Paul, and A. Ghafoor, "Real-time Resource Reservation for Synchronized Multimedia Object over Wireless LAN," in *Proceedings of the IEEE International Symposium on Object Oriented Real-time Distributed Computing*, April 29 – May 1, 2002, Washington DC.

PROFESSIONAL SERVICES

Journal Editorship

- Associate Editor (December 2024 – present), ACM Transactions on Internet Technology.
- Associate Editor (July 2024 – present), IEEE Transactions on Services Computing.
- Associate Editor (January 2023 – present), ACM Digital Government: Research and Practice.
- Associate Editor (January 2018 – present), IEEE Transactions on Dependable and Secure Computing.
- Editorial Board member (July 2016 – present), Computers & Security (Elsevier)

  Editorial Board member (March 2025 – present), International Journal of Information Security (Springer).
- Managing Editor (August 2012 – January 2020), International Journal on Digital Libraries (Springer).
- Guest Editor – Journal of Computer Security (IOS Press), special issue of the DBSec 2013 best papers.

Program Co-Chair

- 39th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2025).
- 27th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2013).

Proceedings Chair

- ACM Symposium on Access Control Models and Technologies (SACMAT) 2024

Treasurer / Registrations Chair

- ACM Symposium on Access Control Models and Technologies (SACMAT), 2012, 2013, 2014, 2015, 2016, 2017, 2018.

Workshop Organization/Report writing

- Local arrangements Chair for the DHS-S&T Workshop on Future Directions in Cyber-physical Systems Security, July 2009.
- Member of the core writing team for preparing report:
    - DHS-S&T: Workshop on Future Directions in Cyber-physical Systems Security, 2009.
    - DHS-S&T: Workshop on Emergency Management: Incident, Resource, and Supply Chain Management (EMWS09).

Technical Program Committee:

1. European Symposium on Research in Computer Security (ESORICS) 2025, 2017, 2016, 2015, 2014, 2013, 2011.
2. ACM International Conference on Information and Knowledge Management (CIKM) 2024, 2023, 2022. Senior Program Committee member.
3. The Web Conference (formerly WWW conference) 2023.
4. Annual International Conference on Digital Government Research (dg.o) 2025, 2024, 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2008.
5. Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec) 2023, 2015, 2014, 2013, 2008, 2009.
6. IEEE 40th International Conference on Distributed Computing Systems (ICDCS) 2020.
7. ACM Symposium on Access control Models and Technologies (SACMAT) 2024, 2015, 2014, 2013, 2012.
8. International Conference on Security and Cryptography (SECRYPT) 2021, 2019, 2018.
9. IEEE International Conference on Collaboration and Internet Computing (CIC) 2018, 2019
10. ACM SAC - Advanced Computational Methods in Bio Medical Imaging and Population Health Track, ACMMIPH 2018.
11. International Symposium on Foundations & Practice of Security (FPS 2017).
12. International Conference on Information Systems Security (ICISS) 2017 and 2006.
13. IEEE International Conference on Information Reuse and Integration (IRI) 2018, 2017, 2016, 2015
14. The 16th International Multi Topic Conference (INMIC) 2013.
15. Workshop on Privacy in the Electronic Society (WPES) 2011.
16. Workshop on Emergency Management: Incident, Resource, and Supply Chain Management (EMWS09).
17. Third International Workshop on Information Assurance (WIA 2007).
18. Workshop on Trusted Collaboration, 2006 (TrustCol-2006).

AWARDS

- IEEE Technical Community on Services Computing Research Innovation Award 2024.
- Best paper award, 12th International Conference on Security and Cryptography, SECRYPT 2015.
- Emerald Literati Network, Outstanding Paper Award 2013, "Resource Sharing using UICDS™ Framework for Incident Management," *Transforming Government: People, Process and Policy*.
- The Clinical Research Informatics (CRI) Distinguished Paper Award for the paper "Identifying Inference Attacks against Healthcare Data Repositories" at AMIA Joint Summit on Translational Science, 2013.

- Best Poster or Demo Award, 12th Annual International Conference on Digital Government Research (dg.o 2011)
- Finalist in the 2005 Dmitris N. Chorafas Foundation Award for best doctoral thesis.

PATENT

- Christof Bornhoevd, Aabhas Paliwal, Nabil Adam, Basit Shafiq. "Service-based processes using policy-based model-to-model conversion and validation techniques." Publication number: US8601432 B2.

PHD STUDENTS

Graduated

1. Ayesha Afzal, graduated in June 2018.
2. Abeer Elahraf. Co-supervised with Jaideep Vaidya (Rutgers University), graduated in October 2021.
3. Muhammad Adeel Zahid, graduated in June 2023.
4. Sehrish Amjad, graduated in July 2024.
5. Ahmed Akhtar, graduated in July 2024.

Current

1. Muhammad Ali, expected graduation in Fall 2025.

PhD Dissertation Committee

1. Xiaoyun He (Rutgers University), graduated in 2011.
2. Jamal Abdul Nasir (LUMS), graduated in Spring 2014.
3. Nazia Badar (Rutgers University), graduated in Fall 2016.
4. Zeeshan Ali Rana (LUMS), graduated in Spring 2016.
5. Ussama Yaqub (Rutgers University), graduated in Fall 2018.
6. Affan Rauf (LUMS), graduated in Fall 2019.
7. Maryam Abdul Ghafoor (LUMS), graduated in Fall 2019.
8. Hafiz Salman Asif (Rutgers University), graduated in Fall 2020.
9. Gunjan Batra (Rutgers University), graduated in Summer 2021.
10. Maryam Abdul Ghafoor (LUMS), graduated in Fall 2019.
11. Nasir Mehmood (LUMS), graduated in Summer 2022.
12. Kanzal Iman (LUMS), graduated in Summer 2022.
13. Syed Muhammad Ahsan Razvi (LUMS), graduated in Summer 2022.
14. Aatira Anum Ahmad (LUMS), graduated in Spring 2023.
15. Mukhtiar Ahmad, graduated in Fall 2023.

External Examiner

1. Muhammad Kamran (National University of Computer and Emerging Sciences), graduated in Fall 2012.
2. Samita Bai (IBA), graduated in Spring 2022.