

Imtiaz Ali Soomro

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SHORT BIOGRAPHY

I am a dedicated researcher and academic with strong expertise in federated and machine learning, cybersecurity. Currently pursuing his Ph.D. in Electrical and Computer Engineering at CASE Institute of Technology, Islamabad, with his defense expected in 2025. Prior to my Ph.D., I have been a Lecturer at the University of Chenab teaching core computing. Have also worked in R &D roles, including international experience in Saudi Arabia. My main research interests lie in secure, privacy-preserving federated intrusion detection systems for Industry 4.0 systems. Have published in high-impact venues such as the IEEE Internet of Things Journal and Journal of Communications and Networks, and hold a patent on federated IDS security.

RESEARCH INTEREST

Federated Learning, Privacy-Preserving Intrusion Detection Systems, Homomorphic Encryption, Lightweight Cryptographic Protocols, Secure Model Aggregation, Cybersecurity in IoT and Cyber-Physical Systems, Adversarial Robustness in Distributed AI.

EDUCATION

PhD in Electrical and Computer Engineering Feb. 2021 - Dec. 2025.
Department of Electrical and Computer Engineering, Sir Syed CASE Institute of Technology, Islamabad, Pakistan.

- Dissertation: "Privacy Preserving Federated Learning based Intrusion Detection System in Internet of Things."
- Advisor: Associate Prof. Syed Jawad Hussain.
- Co-Advisor: Dr. Hamood ur Rehman
- Publications: 05 (4 journals + 1 Patent filed)

Master of Science in Electrical Engineering, MS(EE) Sep. 2010 - June. 2012
Department of Engineering, COMSATS University, Islamabad, Pakistan.

- Thesis: "Spectrum Sensing Techniques in Cognitive Radio Networks."
- Supervisor: Dr. Fasih uddin Butt

EMPLOYMENT

Senior Lecturer Oct. 2024 - till now
Department of Computer Science, Sir Syed CASE Institute of Technology, Islamabad, Pakistan.

- Course Instructor: Computer Science Subjects (BS)
- Member: Final Year Project Management Committee
- Member: Research Committee
- Supervision: Supervised undergraduate Deep Learning and AI-based projects focused on web, mobile and R&D applications. Co-supervised graduate (MS) students on advanced research topics on Deep Learning, Federated Learning and Network Security.

Lecturer May. 2022 - Sep 2024

Department of Computer Science & Information Technology, University of Chenab, Gujrat Campus, Pakistan.

- Course Instructor: Computer Science Subjects (BS)
- Member: Final Year Project Management Committee

- Member: Research Committee
- Supervision: Supervised undergraduate projects focused on web, mobile and R&D applications.

Lecturer Oct 2018 - Apr 2022

Department of Computer Science & Information Technology, University of Lahore, Gujrat Campus, Pakistan. Campus, Pakistan.

- Course Instructor: Software Engineering (BS)
- Supervision: Supervised several undergraduate projects focused on web and mobile-based applications.

Lecturer Feb 2018 - Oct 2018

Department of Computer Science, NICON Group of Colleges, Rawalpindi, Pakistan.

- Course Instructor: Higher National Diploma (HND) Pearson.

Project Manager IT (Network Engineer) July 2015 - Sep 2017

- Responsible & Activities:: Developing project plans, goals, and budgets needed, Guiding and performing strategic analysis for the project

Research Assistant Aug 2014 - Jan 2015

Softshack Pvt Ltd, Gujranwala, Pakistan.

- Responsible & Activities: Working with Dr. Muhammad Fasih uddin Butt (HoD CIIT) as a research Assistant on Cognitive Radio.

Network Engineer June 2013 - July 2014

Florence Pharmaceuticals Company, Islamabad, Pakistan.

- Designing communication networks within an organization. undertaking data network fault investigations in local and wide area (LAN) environments, using information from multiple sources, the configuration of routing and switching equipment.

SELECTED
COURSES TAUGHT

Programming Fundamentals (Module Leader); (Level 6, @ SS CASE IT)

Design and Analysis of Algorithms (Module Leader); (Level 6, @ SS CASE IT)

Advanced Computer Architecture (Module Leader); (Level 7, @ University of Chenab)

Data Communication and Networks (Module Leader); (Level 6, @ University of Lahore)

Internet Architecture and Protocols; (Level 6, @ University of Lahore)

Computer Architecture and Assembly Language, (Level 6, @ University of Lahore)

Digital Logic Design; (Level 6, @ University of Lahore)

PROGRAM
DEVELOPMENT

Designed BS Data Science Sep 2022 - Apr 2023

Department of CS&IT, University of Chenab, Gujrat (Pakistan).

As the department expanded and planned to launch its first-ever program in Data Science, I undertook a pivotal role as the lead curriculum developer for the Bachelor of Science (BS) in Data Science. To this end, I collaborated with faculty and industry experts to align and enhance the curriculum, introduced innovative teaching methods, and achieved program accreditation from the National Computing Education Accreditation Council (NCEAC). Designed a flexible curriculum offering core and elective courses, and conducted faculty workshops for effective implementation. Moreover, I performed a leading role in learning and training of Outcome-based

	Education in the BS Programs.
STUDENT SUPPORT & MENTORING	Personal Tutoring I am deeply passionate about personal tutoring, where I channel my enthusiasm for helping students excel academically. I have overseen over 200 students. Through one-on-one interactions, I not only assist students in achieving their academic goals but also inspire a love for learning and personal growth. Pastoral Care I am always at the forefront to monitor students' well-being beyond academics. I offer holistic support, addressing personal, emotional, and mental health concerns for my tutees and organize events to make them aware of their role in developing a healthy environment. My role is driven by a heartfelt commitment to fostering inclusivity, empathy, and a sense of community within the educational institution, ensuring students thrive both academically and personally.
SUPERVISION EXPERIENCE	Undergraduate Project Supervisions (Level 6) : 15+ Masters Dissertation Co-Supervisions (Level 7) : 2
LEADERSHIP & MANAGEMENT	Final Year Project Director: B.S Computer Science May 2022 - Aug 2024 <i>Department of Computer Science and Information Technology, University of Chenab, Gujrat, (Pakistan).</i> As Final Year Project Director for the B.S. Computer Science program, I oversaw project planning, execution, and evaluation. I guided students in selecting industry-relevant topics, provided technical mentorship, and coordinated with faculty and external evaluators. I also organized two successful open house events to showcase students' innovative projects to industry professionals and stakeholders.
TECHNICAL SKILLS	Programming Languages C, C++, Python, MATLAB, Cisco Packet Tracer, Netgear, Cisco firewall Tools PyTorch, TensorFlow, Keras, OpenCV, FLOWER, Jupyter Notebook, Google Colab, GitHub, EDraw, scikit-learn, NumPy, pandas, Matplotlib. Research & Development Algorithm Development and Benchmarking, Literature Review and Scientific Writing, Paper Publishing and Conference Presentations, Collaborative Research & Cross-Disciplinary Projects. Authoring and Design Adobe Creative Cloud (Illustrator, InDesign, Photoshop), LaTeX/BibTeX, Microsoft Office (Excel, Outlook, PowerPoint, Word)
PROFESSIONAL VOLUNTARY CONTRIBUTIONS	Reviewer of several top-ranked journals including, but not limited to: IEEE IoT Journal, PeerJ, PLOS ONE, Singa and MDPI's Sensors.
RESEARCH STATISTICS	ORCID: 0000-0002-7260-6488 Total Number of Publications : 06 Cumulative Impact Factor (as per JCR, 2023): 20+ https://scholar.google.com/citations?user=xLQq8wkAAAAJhl=enoi=ao

JOURNAL
PUBLICATIONS

I. A. Soomro, H. ur Rehman Khan, S. J. Hussain, Z. Ashraf, M. M. Alnfai and N. N. Alotaibi, "Lightweight privacy-preserving federated deep intrusion detection for industrial cyber-physical system," in Journal of Communications and Networks, vol. 26, no. 6, pp. 632-649, Dec. 2024, doi: 10.23919/JCN.2024.000054. (Published) [IF= 3.2]

I. A. Soomro, H. ur Rehman Khan, S. J. Hussain, S. Latif, H. Mujlid, S. M. Mohsin, and C. Maple "ROCHE: A Robust and End-to-End Privacy-Preserving Federated Learning Framework for Intrusion Detection in Industrial Internet of Things" IEEE Journal of Internet of Things (IoTJ), 2025. (Accepted with Minor Revision Review) [IF=8.9]

I. A. Soomro, H. ur Rehman Khan, S. J. Hussain, A. Iqbal, W. Khalid, and Yu. Heejung "SecureDyn-FL: A Robust Privacy-Preserving Federated Learning Framework for Intrusion Detection in IoT Networks" IEEE Transactions on Network and Service Management (TNSM), 2025. (Under Review) [IF= 5.4]

I. A. Soomro, H. ur Rehman Khan, S. J. Hussain, A. Iqbal, W. Khalid, and Yu. Heejung "GRID-V2X: A Scalable and Intelligent Security Architecture for Next-Generation V2X Systems". Ad hoc Networks [I.F 4.8] (Under Review)

Kamran, H., Hussain, S.J., Latif, S., **Soomro, I.A.**, Alnfai, M.M. and Alotaibi, N.N "FedGAN: Federated diabetic retinopathy image generation". PloS one, 20(7), p.e0326579. **IF 3.9**

Haider, U., Hussain, S.J., **Soomro, I.A.**, Latif, S. and Alnfai, M.M., 2025. "Dynamic antenna clustering along with low RF complexity digital beamforming". PloS one, 20(6), p.e0325361.**IF 3.9**

Tariq, I., Ilyas, M.S.B., Butt, M.A. and **Soomro, I.A.**, 2024. "COVID-19 SOP Monitoring in Real Time Scenario Using Deep Learning". Journal of Computational Science and Applications (JCSA), ISSN: 3079-0867 (Online), 1(1).

CONFERENCE
PROCEEDING

Ilyas, M.S.B., **Soomro, I.A.**, Tariq, I. and Butt, M.A., 2023, May. "Securing Drug Supply Chain with Medledger: A Blockchain Solution to Counterfeit and Hoarding Challenges". In International Conference on Computing Emerging Technologies (pp. 205-222). Cham: Springer Nature Switzerland.

ACADEMIC
REFERENCES

PhD Supervisor:Dr. Hamood Ur Rehman (Assistant Professor), Department of Electrical and Computer Engineering, Habib University, Karachi, Pakistan.[hamood.rehman@sse.habib.edu.pk, (+92) 315 262 1176]

Chairperson, ColleagueAssociate Prof. Syed Jawad Hussain, Department of Computer Science, Sir Syed CASE Institute of Technology, Islamabad, Pakistan. jawad.hussain@case.edu.pk, (+92) 331 111 7954

Research Collaborator: Dr. Adeel Iqbal (Associate Professor), School of Computer Science & Engineering, Yeungnam University, Gyeongsan-si, 38541, Republic of Korea; anadeel@hotmail.com]