

Dr. MUHAMMAD SIRAJ RATHORE

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Islamabad

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PROFESSIONAL SUMMARY

- 21 years of academic and industrial experience
- Blend of work experience from both academia and IT industry
- HEC Approved Supervisor
- Contributed in International Research and Development projects
- 23 research publications in international journals and conferences

AREAS OF INTEREST

- Network Function Virtualization (NFV)
- High Performance Computing
- Network Security
- Cloud Computing

EDUCATION

- **Ph.D. Information and Communication Technology, 2017**
Thesis title: Performance, Isolation and Service Guarantees for Virtualized Network Functions
Institute: KTH Royal Institute of Technology Stockholm, Sweden
- **M.S. Computer Networks, 2005**
Institute: Center for Advance Studies in Engineering (CASE), UET Taxila, Pakistan
- **M.Sc. Computer Science, 2001**
Institute: University of Arid Agriculture Rawalpindi, Pakistan
- **B.Sc. Mathematics/Physics, 1999**
Institute: University of the Punjab Lahore, Pakistan

WORK EXPERIENCE (ACADEMIA)

- **Assistant Professor (CS Department)**
Date: March 2021 – Date
Employer: Capital University of Science and Technology (CUST), Islamabad
- **Assistant Professor (CS Department)**
Date: September 2019 – February 2021
Employer: Barani Institute of Information Technology (BIIT), Rawalpindi
- **Research Engineer (Network Systems Lab)**
Date: September 2011 – May 2017
Employer: KTH Royal Institute of Technology, Stockholm, Sweden

- **Ph.D. Scholarship (Network Systems Lab)**
Date: September 2007 – August 2011
Employer: Swedish Institute (SI), Stockholm, Sweden
- **Assistant Professor (Computer and Software Engineering Dept.)**
Date: September 2006 – August 2007
Employer: University of Engineering and Technology (UET), Taxila
- **Lecturer (Computer and Software Engineering Dept.)**
Date: December 2005 – August 2006
Employer: University of Engineering and Technology (UET), Taxila

WORK EXPERIENCE (IT INDUSTRY)

- **Software Engineer (Cloud Native Applications)**
Date: September 2018 – March 2019
Employer: Ericsson, Stockholm
Job Responsibilities: Software design and development for cloud native telecom applications
- **Software Engineer**
Date: August 2002 – December 2003
Employer: Pakistan International Computer Ltd (PICL), Islamabad
Job Responsibilities: Data processing and Oracle based application development

INTERNATIONAL R & D PROJECTS

Served as a lead researcher in the following projects at KTH Royal Institute of Technology, Sweden:

Virtualization of ICT Infrastructure

- **Project Title:** High performance packet processing on virtualized commodity servers
- **Project Description:** Packet processing on virtualized commodity hardware is an attractive idea but platform suffers from high performance penalties. We suggested dataplane optimizations and achieved considerable performance improvements for Linux-based virtual machines.
- **Funded By:** Federica, European Commission Program for ICT Research

Network Security

- **Project Title:** Carenet, reliable and secure overlay network for remote healthcare applications
- **Project Description:** it is an initiative to deliver high quality healthcare services to patients at their homes. The major service provided by Carenet is a high-definition video call. Carenet deploys a secure encrypted tunnel between hospital and patients' home. Enhanced security is provided by isolating Carenet traffic from regular Internet traffic
- **Funded By:** Vinnova, National Research Funding organization of Sweden

RESEARCH PUBLICATIONS

- 13 publications in HEC approved journals
- 10 publications in prominent international conferences (*e.g., IEEE and IFIP*)

TEACHING AND ADMINISTRATIVE SKILLS

MS (CS) Thesis Supervision

- Analysis of OpenCL application on CPU and GPU
- Secure framework for Wireless Body Areas Sensor Networks (WBAN)
- Detection and Mitigation of DoS attacks on SDN
- SDN based packet classification for remote health care

- Hybrid approach for facial emotion recognition of autistic people
- Towards an efficient hybrid intrusion detection system

Taught Courses

- Data and Computer Communications
- Computer Networks
- Mobile and Wireless Networks
- Network System Programming
- Operating Systems
- Parallel and Distributed Computing
- Object Oriented Programming
- Advanced Cryptograph
- Cyber-attacks modeling and analysis

Project Supervision

- Supervised 14 FYPs at CUST

Committee membership at CUST Islamabad

- Quality Assurance Committee (under the umbrella of QEC)
- Computer Science Board of Studies (BoS)
- Course Review Committee, Department of Computer Science
- Library Management Committee
- Board of Faculty, Faculty of Computing
- Convocation Management Committee

PROGRAMMING SKILLS

- **Operating Systems:** Linux, Microsoft Windows
- **Programming Languages:** C/C++, Java, Python, Linux bash scripting, Socket programming

AWARDS

- Swedish royal certificate in the honor of technology doctorate from KTH Royal Institute, 2018
- Carenet is awarded as a best project by Vinnova Sweden, 2013
- Swedish Institute scholarship awarded for Ph.D. studies, 2007
- Talented student award by Center for Advance Studies in Engineering (CASE Islamabad), 2004
- Assistantship awarded by University of Arid Agriculture Rawalpindi, 2001

PERSONAL INFORMATION

- **Date of birth:** October 16, 1979
- **Nationality:** Pakistan
- **Religion:** Islam
- **Gender:** Male
- **Marital status:** Married

REFERENCES

- Will be furnished on request

HEC Approved Journals Publications

S.No.	Publication	HEC Category	Indexed	IF
1	N. Ahmed, M. S. Rathore , A. Mahmood, M. Daniyal, and M. A. Ngadi, "GA-ANN: An Efficient Hybrid Deep Learning Scheme for Network Intrusion Detection in IoT," <i>Security and Privacy</i> 9, no. 4 (2026): e70232, https://doi.org/10.1002/spy2.70232 .	X	WoS	2.1
2	Fareeha Ashraf, Muhammad Siraj Rathore , "Dealing with Dataset Class Imbalance for Multi-Class Network Intrusion Detection Systems", <i>International Journal of Innovations in Science & Technology</i> , Special Issue, pp545-561, May2026	Y	-	-
3	Ahmed, Naveed, Md Asri Ngadi, Muhammad Siraj Rathore , and Azhar Mahmood. "PCM-RF a Hybrid Feature Selection Mechanism for Intrusion Detection System in IoT." <i>Security and Privacy</i> 8, no. 1 (2025): e499.	X	WoS	2.1
4	Ahmad, Naveed, Muhammad Siraj Rathore , and Md Asri bin Ngadi. "A review on network function virtualisation security challenges and design considerations." <i>International Journal of Networking and Virtual Organisations</i> 31, no. 4 (2024): 368-393.	X	Scopus	0.89
5	Farooq, Shaiza, and Muhammad Siraj Rathore . "SDN-based fair packet scheduling for prioritising healthcare traffic in mobile edge computing: a comparative analysis with PQ and FCFS." <i>International Journal of Internet Protocol Technology</i> 17, no. 3 (2024): 155-166.	X	Scopus	0.67
6	Uzair Ahamd, Muhammad Siraj Rathore, "Mininet-IDS: A Step Towards Reproducible Research for Machine Learning Based Intrusion Detection Systems", <i>International Journal of Innovations in Science & Technology</i> , Special Issue, pp93-103, October 2024	Y	-	-
7	Rasheed, Sadia, and Muhammad Siraj Rathore . "Support Vector Machine Based DDoS Detection and Mitigation in Software Defined Networks." <i>Journal of Innovative Computing and Emerging Technologies</i> 4, no. 2 (2024).	Y	-	-
8	Nadir, Muhammad Nadeem, Muhammad Siraj Rathore , Asad Hayat, and Junaid Abdullah Mansoor. "CPU vs. GPU: Performance comparison of OpenCL Applications on a Heterogeneous Architecture." <i>Journal of Computing & Biomedical Informatics</i> 7, no. 02 (2024).	Y	-	-
9	Hayat, Asad, Yasir Noman Khalid, Muhammad Siraj Rathore , and Muhammad Nadeem Nadir. "A machine learning-based resource-efficient task scheduler for heterogeneous computer systems." <i>The Journal of Supercomputing</i> 79, no. 14 (2023): 15700-15728.	X	WoS	2.50
10	Ujager, Farhan Sabir, Azhar Mahmood, Muhammad Usman, and Muhammad Siraj Rathore . "A Hierarchical Energy Conservation Framework (HECF) of Wireless Sensor Networks by Temporal Association Rule Mining for Smart Buildings." <i>Egyptian Informatics Journal</i> 23, no. 1 (2022): 137-147.	W	WoS	5.20
11	Rathore, Muhammad Siraj , Naveed Ahmad, Rashi Kohli, Jawaid Iqbal, Roobaea Alroobaea, Saddam Hussain, Syed Sajid Ullah, and Fazlullah Umar. "In the direction of service guarantees for virtualized network functions." <i>Wireless Communications and Mobile Computing</i> 2022, no. 1 (2022): 5507845.	W	WoS	2.46
12	Ahmed, Naveed, Kamalrulnizam Abu Bakar, Fatima Tul Zuhra,			

	Tanzila Kehkashan, Muhammad Akram Mujahid, Muhammad Siraj Rathore , Muhammad Dawood, and Babangida Isyaku. "Security & privacy in software defined networks, issues, challenges and cost of developed solutions: a systematic literature review." <i>International Journal of Wireless Information Networks</i> 29, no. 3 (2022): 314-340.	X	WoS	3.08
13	Ahmed, Naveed, Asri bin Ngadi, Johan Mohamad Sharif, Saddam Hussain, Mueen Uddin, Muhammad Siraj Rathore , Jawaaid Iqbal et al. "Network threat detection using machine/deep learning in sdn-based platforms: a comprehensive analysis of state-of-the-art solutions, discussion, challenges, and future research direction." <i>Sensors</i> 22, no. 20 (2022): 7896.	W	WoS	3.90
14	M. S. Rathore, M. Hidell, and P. Sj odin, "Kvm vs. lxc: comparing performance and isolation of hardware-assisted virtual routers," <i>American Journal of Networks and Communications</i> , vol. 2, no. 4, pp. 88–96, 2013.	-	-	-
Impact Factor (Total)		22.90		