

MUHAMMAD AHMAD RATHORE, PH.D.

Technical Program Director · National CERT – Pakistan | Researcher — Cloud-Native Systems, Edge Computing, AI/ML Infrastructure
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RESEARCH PROFILE

Researcher and educator working across cloud-native edge computing, systems visibility, and AI-accelerated scientific computing. Ph.D. research at GIST (South Korea) focused on cloud-native edge orchestration and multi-view systems visibility; postdoctoral work at Northwestern University applied GPU-accelerated ML infrastructure to computational pathology. 8 Q1 journal publications, 8+ conference papers, 400+ citations, h-index 8, i10-index 5.

CURRENT APPOINTMENT

Technical Program Director

Aug 2026 – Present

National CERT – Pakistan · Islamabad

- Lead national-scale cybersecurity programs and digital security platforms.
- Drive AI-enabled vulnerability management, VDP, and proactive cyber defense.
- Advance indigenous cybersecurity capabilities, automation, and national cyber resilience.

ACADEMIC APPOINTMENTS

Assistant Professor

Sept 2025 – Present

NUST – School of Electrical Engineering and Computer Science (SEECs), Islamabad

- Teach computer science courses with industrial-collaboration components spanning cloud infrastructure, Linux systems, and scalable service design.
- Conduct R&D aligned with department research priorities; affiliation verified on Google Scholar (seecs.edu.pk).

Adjunct Faculty

Fall 2024 – Spring 2025

University of New Hampshire, Department of Computer Science

- Taught CMPL 530 (Python Programming I) and CMPL 637 (Python Programming II) to classes of approximately 30 students.
- Developed lab curriculum covering automation, infrastructure scripting, and data handling with NumPy/pandas.

Scientific Officer / Lecturer

Jan 2016 – Feb 2017

COMSATS Institute of Information Technology

- Taught Software Engineering, Network Security, and Object-Oriented Programming at the undergraduate level.
- Supervised undergraduate final-year projects and the IEEE Computer Society student chapter, COMSATS Wah campus.

POSTDOCTORAL RESEARCH

Postdoctoral Fellow

Mar 2022 – Jan 2024

Northwestern University, Feinberg School of Medicine

- Built a GPU-accelerated, cloud-based framework with Kitware, Inc. for whole-slide pathology image analysis, under an NIH National Cancer Institute-funded collaboration (grant 5U01CA220401-04) with Wake Forest School of Medicine and Emory University.
- Co-authored HistomicsStream, a whole-slide-image TensorFlow reader delivering a 65% runtime performance improvement; contributed to HistomicsML, HistomicsUI, and HistomicsTK.
- Optimized AI inference and MLOps pipelines using NVIDIA DALI, cuCIM, Triton Inference Server, and TensorRT.

Postdoctoral Fellow

Sep 2021 – Feb 2022

GIST Blockchain Economy Center, South Korea

- Developed open-source interfaces for Uniswap-style decentralized token exchange (GISTSWAP, DelioswapV3 custom contracts).
- Technical stack: AWS (S3, EC2), TypeScript, JavaScript, Python, Solidity, Rust.

DOCTORAL RESEARCH

Ph.D., Computer Science — Networked Intelligence Lab

Mar 2017 – Aug 2021

Gwangju Institute of Science and Technology (GIST), South Korea — Fully funded

- Doctoral thesis on forecasting SmartX multi-view spatio-temporal visibility for cloud-native edge computing boxes. Kubernetes and OpenStack operations.
- Conducted the OF@TEIN++ Annual Project Conference 2021, inviting 50+ guests; supported project funding of €50,000 as project support staff, assisting the PI with proposals and financial/interim/final reporting.

EDUCATION

Ph.D., Computer Science

2017 – 2021

Gwangju Institute of Science and Technology (GIST), South Korea

SELECTED PUBLICATIONS

8 Q1 journals · 8+ conference papers · 400+ citations · h-index 8 · i10-index 5 (Google Scholar, verified)

Amgad, M., Rathore, M. A., Cooper, L. "A panoptic segmentation approach for tumor-infiltrating lymphocyte assessment: development of the MuTILs model and PanopTILs dataset." *npj Breast Cancer* (Nature), 2024.

Risdianto, A. C., Usman, M., Rathore, M. A. "Transforming Network Management: Intent-Based Flexible Control Empowered by Efficient Flow-Centric Visibility." *Future Internet* 16.7 (2024): 223.

Zeb, S., Rathore, M. A., et al. "Towards AI-enabled NextG Networks with Edge Intelligence-Assisted Microservice Orchestration." *IEEE Network*, Feb 2023.

Farasat, T., Rathore, M. A., Khan, A., et al. "Machine Learning-based BGP Traffic Prediction." Conference paper, Nov 2023.

Farasat, T., Rathore, M. A., Asim, Z., et al. "Poster: SmartX BGP BVT: A First Real-Time BGP Blackholing Visibility Tool." ACM IMC 2023.

Ahmad, M., Kim, J. "Spatio-temporal summarized visualization of SmartX multi-view visibility in cloud-native edge boxes." *Computer Science and Information Systems*.

Rathore, M. A., Usman, M., Kim, J. "Short paper." *Transactions on Emerging Telecommunications Technologies*, Vol. 32, Issue 6, June 2021.

Rathore, M. A., Usman, M., Kim, J. "Conference paper." CFI 2018: Proceedings of the 13th International Conference on Future Internet Technologies.

Mamun, M. S. I., Rathore, M. A., Lashkari, A. H., Stakhanova, N., Ghorbani, A. A. "Detecting malicious URLs using lexical analysis." International Conference on Network and System Security, 467–482, 2016. (344 citations)

Full publication list: scholar.google.com/citations?user=GoiH9mkAAAAJ

RESEARCH INTERESTS

Cloud-native systems · Edge computing · Machine vision · High-performance computing · Systems monitoring and management · Cybersecurity

PROFESSIONAL CERTIFICATIONS

Certified Ethical Hacker (CEH), EC-Council · CCNA · Workshop Series for New Managers