

Kamrul Hasan, Ph.D.

Assistant Professor

Hasan is an Assistant Professor of Electrical and Computer Engineering. He has more than six years of research experience. His research interest includes Cyber-Physical Systems (CPS), CPS Security, Computer networks and security; Software enabled network security, Machine Learning (ML), and Artificial Intelligence (AI) empowered automation in cybersecurity. Since 2014 he worked for four research projects funded by the Department of Defense (DoD), National Science Foundation, Dept. of Energy, and Electric Power Research Institute (EPRI). He authored and co-authored 13 peer-reviewed journal/conference papers, one book chapter, and one US patent.

EDUCATION

Ph. D. Computational Modeling and Simulation Engineering, Old Dominion University, Norfolk, Virginia, USA, 2020.

M. S. Computer Information and Systems Engineering, Tennessee State University, Nashville, Tennessee, USA, 2016.

B. Sc. (Hons.), Electrical and Electronics Engineering, Bangladesh University of Engineering and Technology, Bangladesh, 2006.

EXPERIENCE

Assistant Professor: (2021-present): Electrical and Computer Engineering, Tennessee State University, Nashville, USA

PDU Cyber Security Researcher:(May 2019-August 2019): Electric Power Research Institute, Palo Alto, CA, USA

Cyber Security researcher: (June 2018-August 2018): Accenture Cyber Fusion Lab, Arlington, VA, USA

Research Assistant: (2016- 2020): Virginia Modeling and Simulation Center, Old Dominion University, Suffolk, VA, USA

RESEARCH

Areas of Interest: Cyber-Physical Systems (CPS), CPS Security, Computer networks and security; Software enabled network security, Machine Learning (ML), and Artificial Intelligence (AI) empowered automation in cybersecurity.

Research Summary: (2014-present):

- Worked for four funded research projects. Those projects funded by the Department of Defense (DoD), National Science Foundation (NSF), Dept. of Energy (DoE), and Electric Power Research Institute (EPRI)
- Authored and co-authored one edited book chapter, 14 peer-reviewed journal/conference papers.

RESEARCH GRANTS AND CONTRACTS:

1. **Co-Principal Investigator**, "CISE-MSI: RCBP-RF: IIS-RI: Analytically-based frameworks for AI model verification and improvement in cyber-physical systems," NSF, Division Of Computer and Network Systems, 2 year 2021-2023, Grant Amount: \$239,848.00.

PUBLICATIONS

Book/Book Chapters:

1. **Hasan, Kamrul**, Sachin Shetty, Amin Hassanzadeh, Malek Ben Salem, and Jay Chen. "Software-Defined Networking for Cyber Resilience in Industrial Internet of Things (IIoT)." *Modeling and Design of Secure Internet of Things* (2020): 453-477.

Refereed Journal/Conference Proceedings:

2. **Hasan, Kamrul**, Sachin Shetty, Md Ullah, Amin Hassanzadeh, and Tariqul Islam. "Criticality based Optimal Cyber Defense Remediation in Energy Delivery Systems." *EAI Endorsed Transactions on Security and Safety* 8, no. 28 (2021): e5.
3. Ashik, Mahmudul Hassan, Tariqul Islam, **Kamrul Hasan**, and Kiho Lim. "A Blockchain-Based Secure Fog-Cloud Architecture for Internet of Things." In 2021 8th IEEE International Conference on Cyber Security and Cloud Computing (CSCloud)/2021 7th IEEE International Conference on Edge Computing and Scalable Cloud (EdgeCom), pp. 1-3. IEEE, 2021.
4. **Hasan, Kamrul**. "Cyber Defense Remediation in Energy Delivery Systems." (2020).
5. Ullah, Sharif, Sachin Shetty, Amin Hassanzadeh, Anup Nayak, and **Kamrul Hasan**. "On the Effectiveness of Intrusion Response Systems against Persistent Threats." In *2020 International Conference on Computing, Networking and Communications (ICNC)*, pp. 415-421. IEEE, 2020.
6. **Hasan, Kamrul**, Sachin Shetty, and Sharif Ullah. "Artificial Intelligence Empowered Cyber Threat Detection and Protection for Power Utilities." In *2019 IEEE 5th International Conference on Collaboration and Internet Computing (CIC)*, pp. 354-359. IEEE, 2019.
7. **Hasan, Kamrul**, Sachin Shetty, Sharif Ullah, Amin Hassanzadeh, and Ethan Hadar. "Towards optimal cyber defense remediation in energy delivery systems." In *2019 IEEE Global Communications Conference (GLOBECOM)*, pp. 1-7. IEEE, 2019.
8. **Hasan, Kamrul**, Sachin Shetty, Amin Hassanzadeh, and Sharif Ullah. "Towards Optimal Cyber Defense Remediation in Cyber Physical Systems by Balancing Operational Resilience and Strategic Risk." In *MILCOM 2019-2019 IEEE Military Communications Conference (MILCOM)*, pp. 1-8. IEEE, 2019.
9. Ullah, Sharif, Sachin Shetty, Anup Nayak, Amin Hassanzadeh, and **Kamrul Hasan**. "Cyber Threat Analysis Based on Characterizing Adversarial Behavior for Energy Delivery System." In *International Conference on Security and Privacy in Communication Systems*, pp. 146-160. Springer, Cham, 2019.
10. **Hasan, Kamrul**, Sachin Shetty, Amin Hassanzadeh, and Malek Ben Salem. "Self-healing cyber resilient framework for software defined networking-enabled energy delivery system." In *2018 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 1692-1697. IEEE, 2018.
11. **Hasan, Kamrul**, Sachin Shetty, Amin Hassanzadeh, Malek Ben Salem, and Jay Chen. "Modeling cost of countermeasures in software defined networking-enabled energy delivery systems." In *2018 IEEE Conference on Communications and Network Security (CNS)*, pp. 1-9. IEEE, 2018.

12. **Hasan, Kamrul**, Sachin Shetty, John Sokolowski, and Deepak K. Tosh. "Security game for cyber physical systems." In *Proceedings of the Communications and Networking Symposium*, pp. 1-12. 2018.
13. **Hasan, Kamrul**, Sachin Shetty, and Taiwo Oyedare. "Cross layer attacks on GSM mobile networks using software defined radios." In *2017 14th IEEE Annual Consumer Communications & Networking Conference (CCNC)*, pp. 357-360. IEEE, 2017.
14. **Hasan, Kamrul**. "Cross-layer attacks on gsm mobile networks using software defined radios (SDR)." PhD diss., Tennessee State University, 2016.

Patent:

15. Amin Hassanzadeh, **Kamrul Hasan**, and Anup Nayak. "Criticality analysis of attack graphs." US Patent US20200137104A1.

GUIDED GRADUATE PROJECTS, THESES, AND DISSERTATION

AWARDS/FELLOWSHIPS/SCHOLARSHIPS/SERVICES

EPRI Research Challenge (with a grant award of USD 75K): Universality-wise research competition on cyber resilience of power grid-1st place, 2019.

Travel Grant (With cash award of USD 1200): Awarded IEEE Computer Network Security (CNS) student travel grant, 2018.

Research Fellowship: Virginia Modeling and Simulation Center, Old Dominion University, 2016-2020.

Research Fellowship: Department of Electrical and Computer Engineering, Tennessee State University, 2014-2016.

Provost Award: For securing the **3.75/4.0 GPA** in consecutive two-semesters in B. Sc.(Hons), Bangladesh University of Engineering and Technology, Bangladesh, 2004.

Merit Scholarship: Board of Secondary and Higher Secondary Education (Dhaka), Bangladesh Government, 2000.

PROFESSIONAL AND HONOR SOCIETIES:

Member: The Institute of Electrical and Electronics Engineers (IEEE) (2018-Present)

Member: IEEE Communication Society (ComSoc) (2018-Present)

Member: Project Management Institute (PMI) (2011-Present)

UNIVERSITY SERVICES:

Web Manager: Web site manager of ECE department

PUBLIC SERVICES:

Technical Program member: IEEE Transactions on Network and Service Management (IEEE TNSM) Journal, 2020-Present

Executive Member: Bangladesh Association of Nashville (a cultural organization), 2021-Present.