Name: Sachin Shetty
Date: July 2026
Campus Address: 1030 University Blvd, Suffolk, VA 23435

Education

Ph.D. in Modeling and Simulation	Old Dominion University	2007
M.S. in Computer Science	University of Toledo	2002
B.E. in Computer Engineering	Mumbai University	1998

Experience

Professor — 2021- present
Electrical and Computer Engineering Department
Old Dominion University

Executive Director, Center for Secure and Intelligent Critical Systems — 2021 – present
Virginia Modeling, Analysis and Simulation Center

Associate Professor — 2016-2021
Computational, Modeling and Simulation Engineering Department
Old Dominion University

Associate Professor — 2016 - 2019
Virginia Modeling, Analysis and Simulation Center

Associate Professor — 2015 - 2016
Electrical and Computer Engineering Department, Tennessee State University

Assistant Professor — 2009 - 2015
Electrical and Computer Engineering Department, Tennessee State University

Assistant Professor — 2008 – 2009
Electrical and Computer Engineering Department, Rowan University

Adjunct Professor — 2007 - 2008
Electrical and Computer Engineering Department, Old Dominion University

Publications (2008-2026) (* - Student Co-Authored)

Edited Books

1. Charles Kamhoua, Alexander Kott, Laurent Njilla, Sachin Shetty, “Modeling and Design of Secure Internet of Things”, John Wiley &Sons, 1 edition, 2020, ISBN 978-1-119-59336-2
2. Sachin Shetty, Charles Kamhoua, Laurent Njilla, “Blockchain for Distributed Systems Security”, Wiley-IEEE Computer Scoeity, 1 edition, 2019, ISBN 978-1-119-51960-7
3. Sachin Shetty, Xuebiao Yuchi and Min Song, "Moving Target Defense for Distributed Systems," Springer, ISBN 978-3-319-31031-2, 2016
4. D. B. Rawat, M. Song, and Sachin Shetty, ""Dynamic Spectrum Access for Wireless Networks," SpringerBriefs of Electrical and Computer Engineering, ISBN 978-3-319-15298-1 Springer Verlag, 2015

5. Abdul Rahman, Christopher Redino, Dhruv Nandakumar, Tyler Cody, Sachin Shetty, Dan Radke, "Reinforcement Learning for Cyber Operations: Applications of Artificial Intelligence for Penetration Testing", ISBN: 978-1-394-20647-6, December 2024, Wiley-IEEE Press, 288 pages

Refereed Book Chapters

1. *Haque, Md Ariful, and Sachin Shetty. "Leveraging Machine Learning in Financial Fraud Forensics in the Age of Cybersecurity." In *Technologies to Advance Automation in Forensic Science and Criminal Investigation.* edited by Chen, Chung-Hao and Wen-Chao Yang, and Lijian Chen, 220-249. Hershey, PA: IGI Global, 2022.
2. Ghosh, Uttam and Pushpita Chatterjee, and Sachin Shetty. "Securing SDN-Enabled Smart Power Grids: SDN-Enabled Smart Grid Security." In *Research Anthology on Smart Grid and Microgrid Development.* edited by Management Association, Information Resources, 1028-1046. Hershey, PA: IGI Global, 2022. (Citations – 2)
3. *Ariful Haque, Sachin Shetty, Bheshaj Krishnappa, "CPS resilience: Frameworks, metrics, complexities, challenges and future directions", Complexity Challenges in Cyber Physical Systems: Using Modeling and Simulation (M&S) to Support Intelligence, Adaptation and Autonomy, Eds.: Saurabh Mittal and Andreas Tolk, Wiley, 2019.
4. Eranga Herath, Xueping Liang, Pete Foytik, Sachin Shetty, Promize - Blockchain and Self Sovereign Identity Empowered Mobile ATM Platform. In: Arai K. (eds) Intelligent Computing. Lecture Notes in Networks and Systems, vol 284. Springer
5. *Haque MA, Shetty S, Gold K, Krishnappa B (2021) Realizing cyber-physical systems resilience frameworks and security practices. In: Security in cyber-physical systems, pp 1–37
6. Sachin Shetty, Xueping Liang, Dan Bowden , Juan Zhao , Lingchen Zhang, "Blockchain based Decentralized Accounability and Self Sovereignty in Healthcare Systems, *In: Business Transformation through Blockchain. Palgrave Macmillan, part of Springer (Nature);* 2019. p. 119–149.

Refereed Journal Papers

1. Joseph Zalameda, Megan A. Witherow, DeMarcus Edwards, Sachin Shetty, Danda B. Rawat, Khan Iftekharuddin: Adversarial Attack Resilient Computational Modeling for Person Re-Identification in Visual IoT Applications. IEEE Internet of Things Journal, 2026. Impact Factor – 8.9
2. Mehrdad Sadehvand, Neda Moghim, Behrouz Shahgholi Ghahfarokhi, Sachin Shetty: TrMAB-PC: Empowering Uplink Resource Sharing Through Intelligent Transmission Power Control in Cellular and D2D Communications. IEEE Transactions on Green Communications and Networking, 2026. Impact Factor – 8.3
3. Basudeb Bera, Abhishek Bisht, Ashok Kumar Das, Sandip Roy, Sachin Shetty, Biplab Sikdar: Adversarial Attacks Resilient Machine Learning-Enabled Access Control Scheme for Consumer Electronics in IoT-Based Applications. IEEE Transactions on Consumer Electronics, 2026.
4. Samira Taheri, Neda Moghim, Naser Movahhedinia, Sachin Shetty: A framework for task offloading in heterogeneous computing applications within the fog RAN architecture. Telecommunication Systems 88(3): 105 (2025). Impact Factor – 2.3
5. Ali Mohammed Alzuwaini, Neda Moghim, Sachin Shetty: Energy-Efficient User Association and Sub-Channel Allocation in Ultra-Dense Networks: A Clustering-Based Approach With LSTM-Driven Channel Prediction. IEEE Transactions on Consumer Electronics 71(2): 2738-2748 (2025). Impact Factor – 10.04
6. Bikash Chandra Singh, Peter Foytik, Rafael Diaz, Sachin Shetty: TL-ConvLSTM: A Transfer-Learning-Based Convolutional LSTM to Identify and Forecast Traffic in the NextG Environments. IEEE Systems Journal 19(2): 358-369 (2025). Impact Factor – 3.98
7. Mohammad Wazid, Shivansh Nautiyal, Ashok Kumar Das, Sachin Shetty, SK Hafizul Islam: A Secure Authenticated Healthcare Data Analysis Mechanism in IoMT-Enabled Healthcare. Security and Privacy 8(1) (2025). Impact Factor – 2.1

8. Mahsa Mahvash, Neda Moghim, Mojtaba Mahdavi, Mahdieh Amiri, Sachin Shetty: Blockchain-Inspired Trust Management in Cognitive Radio Networks with Cooperative Spectrum Sensing. Pervasive and Mobile Computing 106: 101999 (2025). Impact Factor – 3.5
9. Ali Parsa, Neda Moghim, Sachin Shetty: QoS-Aware Link Adaptation for Beyond 5G Networks: A Deep Reinforcement Learning Approach. IEEE Open Journal of the Communications Society 6: 6368-6382 (2025). Impact Factor – 6.3
10. Sandip Roy, Abhishek Bisht, Ashok Kumar Das, Sachin Shetty: Age of Information-Based Optimal Scheduling With Energy Cost Trade-Off for Smart Warehouse: A Deep Reinforcement Learning-Based Approach. IEEE Access 13: 163982-163998 (2025). Impact Factor – 3.6
11. Saurabh Agrawal, Anusha Vangala, Ashok Kumar Das, Neeraj Kumar, Mohammed J. F. Alenazi, Sachin Shetty: Designing Secure Location-Based Authenticated Key Agreement Mechanism in Maritime Internet of Vessels for Big Data Analytics. IEEE Internet Things J. 12(5): 4641-4656 (2025)
12. Saurabh Agrawal, Prakash Tekchandani, Soumya Banerjee, Ashok Kumar Das, Shantanu Pal, Sachin Shetty: Secure Cloud-Storage-Based Big Data Analytics Scheme for Intelligent Vehicles Environment. IEEE Internet Things J. 12(7): 7828-7845 (2025)
13. Md. Shirajum Munir, Sravanthi Proddatoori, Manjushree Muralidhara, Trinidad Mario Dena, Walid Saad, Zhu Han, Sachin Shetty: A Trust-By-Learning Framework for Secure 6G Wireless Networks Under Native Generative AI Attacks. IEEE Open J. Commun. Soc. 6: 6045-6065 (2025)
14. S. Roy, S. Nandi, R. Maheshwari, S. Shetty, A. K. Das and P. Lorenz, "Blockchain-Based Efficient Access Control With Handover Policy in IoV-Enabled Intelligent Transportation System," in *IEEE Transactions on Vehicular Technology*, vol. 73, no. 3, pp. 3009-3024, March 2024, doi: 10.1109/TVT.2023.3322637, Impact Factor, 8.1
15. Md. Shirajum Munir , Ki Tae Kim , Apurba Adhikary , Walid Saad , Sachin Shetty , Seong-Bae Park , Choong Seon Hong : Neuro-Symbolic Explainable Artificial Intelligence Twin for Zero-Touch IoE in Wireless Network. IEEE Internet Things J. 10(24): 22451-22468 (2023) **(Impact Factor – 10.6)**
16. Siddhant Thapliyal, Mohammad Wazid, Devesh Pratap Singh, Ashok Kumar Das, Sachin Shetty, Abdullah Alqahtani: Design of Robust Blockchain-Envisioned Authenticated Key Management Mechanism for Smart Healthcare Applications. IEEE Access 11: 93032-93047. **(Impact Factor – 3.9)**
17. Xueping Liang, Charalambos Konstantinou, Sachin Shetty, Eranga Bandara, Ruimin Sun: Decentralizing Cyber Physical Systems for Resilience: An Innovative Case Study from A Cybersecurity Perspective. Comput. Secur. 124: 102953 (2023) **(Impact Factor – 5.6)**
18. Mohammad Wazid, Ashok Kumar Das, Sachin Shetty: BSFR-SH: Blockchain-Enabled Security Framework Against Ransomware Attacks for Smart Healthcare. IEEE Trans. Consumer Electron. 69(1): 18-28 (2023) **(Impact Factor – 4.3)**
19. Eranga Bandara, Sachin Shetty, Ravi Mukkamala, “Casper: a blockchain-based system for efficient and secure customer credential verification”. *J BANK FINANC TECHNOL* (2021). (H-Index – 4)
20. Eranga Bandara, Xueping Liang, Peter Foytik, Sachin Shetty, Crissie Hall, Daniel Bowden, Nalin Ranasinghe, Kasun De Zoysa, “A blockchain empowered and privacy preserving digital contact tracing platform”, Journal of Information Processing & Management, Volume 58, Issue 4,2021, (Impact Factor – 6.22)
21. Eranga Bandara, Xueping Liang, Peter Foytik, Sachin Shetty, Nalin Ranasinghe, Kasun De Zoysa, “Rahasak—Scalable blockchain architecture for enterprise applications,” Journal of Systems Architecture, Volume 116, 2021. (Impact Factor – 3.77)
22. Eranga Bandara, Deepak Tosh, Peter Foytik, Sachin Shetty, Nalin Ranasinghe, Kasun De Zoysa, “Tikiri—Towards a lightweight blockchain for IoT, “ Future Generation Computer Systems, Volume 119, 2021, (Impact Factor – 7.187)
23. S. P. Gochhayat, S. Shetty, R. Mukkamala, P. Foytik, G. A. Kamhoua and L. Njilla, "Measuring Decentrality in Blockchain based Systems," in *IEEE Access*, September 2020 (Impact Factor – 3.745)
24. Muhammad Saad, Jeffrey Spaulding, Laurent Njilla, Charles Kamhoua, Sachin Shetty, DaeHun Nyang, and David Mohaisen, "Exploring the Attack Surface of Blockchain: A Comprehensive Survey", IEEE Communications Surveys & Tutorials, 2020 (Impact Factor – 23.7)
25. *Kjartan Palsson, Steinn Guðmundsson, Sachin Shetty, "Analysis of the impact of cyber events for cyber insurance," in The Geneva Papers on Risk and Insurance - Issues and Practice, 2020 (Impact Factor – 0.867)

26. M. Wazid, A.K. Das, Sachin Shetty,M. Jo, "A Tutorial and Future Research for Building a Blockchain-Based Secure Communication Scheme for Internet of Intelligent Things," in IEEE Access, Vol. 8, pp. 1-17, 2020 (Impact Factor – 3.745)
27. Deepak Tosh, Sachin Shetty, Xueping Liang, Charles Kamhoua, Laurent Njilla, "Data Provenance in the Cloud: A Blockchain-Based Approach," in *IEEE Consumer Electronics Magazine*, vol. 8, no. 4, pp. 38-44, July 2019. (Impact Factor – 3.373)
28. Deepak Tosh, Sachin Shetty, Xueping Liang, Charles Kamhoua, Laurent Njilla, "Data Provenance in the Cloud: A Blockchain-Based Approach," in *IEEE Consumer Electronics Magazine*, vol. 8, no. 4, pp. 38-44, July 2019. (Impact Factor – 3.273)
29. Sachin Shetty, Michael McShane, Linfeng Zhang, Jay Kesan, Charles A. Kamhoua, Kevin Kwiat, Laurent Njilla, "Reducing Informational Disadvantages to Improve Cyber Risk Management", *Geneva Risk and Insurance Review*, vol. 43, pp. 224-238, April 2018 (Impact Factor – 0.625)
30. Xueping Liang, Sachin Shetty, Deepak Tosh, Peter Foytik, Lingchen Zhang, "A Reliable Data Provenance and Privacy Preservation Architecture for Business-Driven Cyber-Physical Systems Using Blockchain", *International Journal of Information Security and Privacy (IJISP)*, vol 12, pp. 68-81, 2018 (Impact Factor – 0.18)

Refereed Conference Papers

1. Fahmida Afrin, Neda Moghim, Safdar Hussain Bouk, Sandip Roy, Sachin S. Shetty: Multi-scale Graph Neural Network for Low-SNR Wireless Signal Classification. IEEE CCNC 2026.
2. Lawrence Obiuwevwi, Krzysztof J. Rechowicz, Vikas Ashok, Sachin Shetty, Sampath Jayarathna: Cognitive Prosthetic: An AI-Enabled Multimodal System for Episodic Recall in Knowledge Work. ACM CHI Extended Abstracts 2026.
3. Mahmudul Hasan, Sharif Ullah, Sachin Shetty: Quantum-Enhanced Federated Learning via QAOA Feature and Gate Selection with Skew-Symmetric Lipschitz Dynamics. IEEE ICNC 2026.
4. Nishat Ara Nipa, Mohammed Hamza Chao, Sachin Shetty: ImpactNet: A Robust Two-Stage Disaster Damage Mapping Model For Cross-Domain Satellite Imagery. IEEE ICNC 2026.
5. Shadman Mahmood Khan Pathan, Qianlong Wang, Jonathan Takeshita, Sakan Binte Imran, Sachin Shetty: Privacy-Preserving Post Deployment Model Calibration with Fully Homomorphic Encryption. IEEE ICNC 2026.
6. Eranga Bandara, Ross Gore, Sachin Shetty, Ravi Mukkamala, Tharaka Hewa, Abdul Rahman, Xueping Liang, Safdar H. Bouk, Peter Foytik, Ng Wee Keong, Kasun De Zoysa: An Agentic AI Control Plane for 6G Network Slice Orchestration, Monitoring, and Trading. IEEE IWCMC 2026.
7. Eranga Bandara, Amin Hass, Sachin Shetty, Ravi Mukkamala, Ross Gore, Sachini Rajapakse, Xueping Liang, Safdar H. Bouk: ASTRIDE: A Security Threat Modeling Platform for Agentic-AI Applications. IEEE IWCMC 2026.
8. Eranga Bandara, Neda Moghim, Safdar H. Bouk, Sachin Shetty, Ross Gore, Ravi Mukkamala, Abdul Rahman, Xueping Liang, Ng Wee Keong, Kasun De Zoysa: Deep-RF - An Agentic AI Framework for RF Signal Classification and Real-Time 5G O-RAN Attack Detection. IEEE IWCMC 2026.
9. Valentina Walters N. Teboh, Peter B. Foytik, Safdar Hussain Bouk, Sachin Shetty: Performance Evaluation of 5G Authentication Protocols: A Testbed-Based Comparison of 5G-AKA and EAP-AKA'. IEEE IWCMC 2026.
10. Nishat Ara Nipa, Mohammed Hamza Chao, Sachin Shetty: Disentanglement under Stress: Limits of Entropy-based Aleatoric and Epistemic Uncertainty Estimation in Bayesian Deep Learning. IEEE IWCMC 2026.
11. Samyak Jain, Pronaya Bhattacharya, Sudip Chatterjee, Sandip Roy, Thippa Reddy Gadekallu, Sachin Shetty: MAC-Unlearn: A Differentially Private Federated Edge Unlearning Framework to secure MAC De-randomization. IEEE IWCMC 2026.
12. Nishat Mahdiya Khan, Pronaya Bhattacharya, Rekha Vig, Sandip Roy, Thippa Reddy Gadekallu, Sachin Shetty: QuantRIC: A Hybrid Quantum-Classical Framework for Predictive ISAC-RIS Orchestration in 6G O-RAN. IEEE IWCMC 2026.
13. Nishat Mahdiya Khan, Pronaya Bhattacharya, Sandip Roy, Thippa Reddy Gadekallu, Sachin Shetty: TimeWrap: A Time-Lock Protocol for Secure Agentic Coordination in 6G uRLLC Networks. IEEE IWCMC 2026.

14. Nishat Mahdiya Khan, Pronaya Bhattacharya, Sandip Roy, Sachin Shetty: QuantLLM: A Hybrid Classical-Quantum LLM Transformer with Adaptive Routing Framework for Inference Latency Minimization. SoftCOM 2025.
15. Sai Sriram Gonthina, Sandip Roy, Sayyed Farid Ahamed, Pronaya Bhattacharya, Sachin Shetty: Multi-Metric Detection and Mitigation of Label-Flipping Attacks in Federated Learning Using Conditional Variational Autoencoders. SoftCOM 2025.
16. Eranga Bandara, Amin Hass, Sachin Shetty, Ravi Mukkamala, Ross Gore, Abdul Rahman, Safdar H. Bouk: Deep-Stride: Automated Security Threat Modeling with Vision-Language Models. SoftCOM 2025.
17. Sushmitha Halli Sudhakara, Md. Shirajum Munir, Mostafizur Rahman, Sachin Shetty: Native AI-based Predictive Operational Resiliency in Cyber-Physical Energy Systems. IWCMC 2025.
18. Amit Chakraborty, Sayyed Farid Ahamed, Sandip Roy, Soumya Banerjee, Kevin Choi, Abdul Rahman, Alison Hu, Edward Bowen, Sachin Shetty: RADEP: A Resilient Adaptive Defense Framework Against Model Extraction Attacks. IWCMC 2025.
19. Nishat Ara Nipa, Sachin Shetty: Uncertainty Aware Indoor Localization: Deep Learning Regression for Predicting Mobile Device Locations. IWCMC 2025.
20. Md. Shirajum Munir, Sravanthi Proddatoori, Manjushree Muralidhara, Marco A. Gamarra, Walid Saad, Zhu Han, Sachin Shetty: Securing Next-Generation Wireless Networks Against Native GenAI Attacks: An Evidence-Theoretic Approach. IWCMC 2025.
21. Soumya Banerjee, Sandip Roy, Sachin Shetty: P2Q-ASB: PUF-Secured Post Quantum Aggregate Signature Scheme using Public Blockchain for e-Healthcare Systems. IWCMC 2025.
22. Sayyed Farid Ahamed, Sandip Roy, Soumya Banerjee, Marc Vucovich, Kevin Choi, Abdul Rahman, Alison Hu, Edward Bowen, Sachin Shetty: Evaluating Query Efficiency and Accuracy of Transfer Learning-based Model Extraction Attack in Federated Learning. IWCMC 2025.
23. Md. Morshed Alam, Lokesh Chandra Das, Sandip Roy, Sachin Shetty, Weichao Wang: RESTRAIN: Reinforcement Learning-Based Secure Framework for Trigger-Action IoT Environment. IWCMC 2025.
24. Sayyed Farid Ahamed, Amit Chakraborty, Sandip Roy, Bikash Chandra Singh, Sachin Shetty: OT3L: Optimal Transport-based Targeted Transfer Learning for Efficient Domain Adaptation. ICNC 2025.
25. Sayyed Farid Ahamed, Soumya Banerjee, Sandip Roy, Aayush Kapoor, Marc Vucovich, Kevin Choi, Abdul Rahman, Edward Bowen, Sachin Shetty: Privacy Drift: Evolving Privacy Concerns in Incremental Learning. ICNC 2025.
26. Muhammad Enayetur Rahman, Md. Shirajum Munir, Sachin Shetty: Deep Learning-Driven Beam and Blockage Forecasting for Reliable mmWave Vehicular Networks. ICNC 2025.
27. Fahmida Afrin, Neda Moghim, Sachin S. Shetty: ResGCN: A Scalable, Robust and Efficient Approach for Radio Fingerprinting. ICNC 2025.
28. Emmanuel J. Samson, Kamrul Hasan, Liang Hong, Imtiaz Ahmed, Henry Onyeka, Sachin Shetty: Optimizing 5G Network Slices: LSTM and Game Theory Synergy. ICNC 2025.
29. Sayyed Farid Ahamed, Soumya Banerjee, Sandip Roy, Marc Vucovich, Devin Quinn, Kevin Choi, Abdul Rahman, Alison Hu, Edward Bowen, Sachin Shetty: Accuracy-Privacy Trade-off in the Mitigation of Membership Inference Attack in Federated Learning. ICNC 2025.
30. Md. Shirajum Munir, Sravanthi Proddatoori, Manjushree Muralidhara, Sachin Shetty: A Bayesian Belief Network Framework for Protecting Generative AI-driven Attack in Smart Grid Communication. ICNC 2025.
31. Amit Chakraborty, Sandip Roy, Sayyed Farid Ahamed, Eranga Bandara, Bikash Chandra Singh, Sachin Shetty: A Unified Blockchain-based Framework for Decentralized Collaborative Transfer Learning using Adaptive Incentivization. ICC 2025.
32. Eranga Bandara, Safdar H. Bouk, Sachin Shetty, Sandip Roy, Ravi Mukkamala, Abdul Rahman, Peter Foytik, Xueping Liang, Ng Wee Keong, Kasun De Zoysa: Llama-Recipe - Fine-Tuned Meta's Llama LLM, PBOM and NFT Enabled 5G Network-Slice Orchestration and End-to-End Supply-Chain Verification Platform. CCNC 2025: 1-6
33. Eranga Bandara, Safdar H. Bouk, Sachin Shetty, Ross Gore, Sastry Kompella, Ravi Mukkamala, Abdul Rahman, Peter Foytik, Xueping Liang, Ng Wee Keong, Kasun De Zoysa: VindSec-Llama - Fine-Tuned Meta's Llama-3 LLM, Federated Learning, Blockchain and PBOM-enabled Data Security Architecture for Wind Energy Data Platforms. IWCMC 2025: 120-126
34. Eranga Bandara, Safdar H. Bouk, Sachin Shetty, Ross Gore, Sastry Kompella, Ravi Mukkamala, Abdul Rahman, Peter Foytik, Xueping Liang, Ng Wee Keong, Kasun De Zoysa: Bassa-Llama - Fine-Tuned

Meta's Llama LLM, Blockchain and NFT Enabled Real-Time Network Attack Detection Platform for Wind Energy Power Plants. IWCMC 2025: 330-336

35. E. Bandara *et al*., "WedaGPT — Generative-AI (with Custom-Trained Meta's Llama2 LLM), Blockchain, Self Sovereign Identity, NFT and Model Card Enabled Indigenous Medicine Platform," *2024 IEEE Symposium on Computers and Communications (ISCC)*, Paris, France, 2024, pp. 1-6, doi: 10.1109/ISCC61673.2024.10733674.
36. E. Bandara, S. Shetty, A. Rahman, R. Mukkamala, P. Foytik and X. Liang, "RMF-GPT — OpenAI GPT-3.5 LLM, Blockchain, NFT, Model Cards and OpenScap Enabled Intelligent RMF Automation System," *2024 International Conference on Computing, Networking and Communications (ICNC)*, Big Island, HI, USA, 2024, pp. 653-658, doi: 10.1109/ICNC59896.2024.10555963.
37. *****P. Foytik, S. H. Bouk, G. Anderson and S. Shetty, "Self-Sovereign Identity Management in Ship-Based 5G-Devices Use Case," *2024 IEEE 21st Consumer Communications & Networking Conference (CCNC)*, Las Vegas, NV, USA, 2024, pp. 650-651, doi: 10.1109/CCNC51664.2024.10454874.
38. E. Bandara *et al*., "SliceGPT – OpenAI GPT-3.5 LLM, Blockchain and Non-Fungible Token Enabled Intelligent 5G/6G Network Slice Broker and Marketplace," *2024 IEEE 21st Consumer Communications & Networking Conference (CCNC)*, Las Vegas, NV, USA, 2024, pp. 439-445, doi: 10.1109/CCNC51664.2024.10454701
39. Nadini Sahabandu, Eranga Bandara, Peter Foytik, Sachin Shetty, Ravi Mukkamala, Abdul Rahman, Xueping Liang, GreenThread - Blockchain, Non-Fungible Token(NFT), Model Cards, Self-Sovereign Identity and IPFS Enabled Sustainable Circular Fashion Platform. ANNSIM 2023: 357-243
40. Eranga Bandara, Sachin Shetty, Peter Foytik, Abdul Rahman, Ravi Mukkamala, Xueping Liang, Nadini Sahabandu:Blockchain, NFT, Federated Learning and Model Cards enabled UAV Surveillance System for 5G/6G Network Sliced Environment. ISNCC 2023: 1-8
41. Eranga Herath,Sachin Shetty**,** Abdul Rahman, Ravi Mukkamalla, Xueping Liang, "Moose: A Scalable Blockchain Architecture for 5G Enabled IoT with Sharding and Network Slicing," 2022 IEEE Wireless Communications and Networking Conference (WCNC), Track 4- Emerging Technologies, Standards and Applications
42. Eranga Herath, Sachin Shetty, Abdul Rahman, Ravi Mukkamala,Juan Zhao, Xueping Liang, "Bassa-ML - A Blockchain and Model Card Integrated Federated Learning Provenance Platform," IEEE CCNC 2022.
43. E. Bandara, X. Liang, P. Foytik and Sachin Shetty, "Blockchain and Self-Sovereign Identity Empowered Cyber Threat Information Sharing Platform," *2021 IEEE International Conference on Smart Computing (SMARTCOMP)*, 2021.
44. *A. Davenport and S. Shetty, "Comparative Analysis of Elliptic Curve and Lattice Based Cryptography," *2021 Annual Modeling and Simulation Conference (ANNSIM)*, 2021
45. E. Bandara, X. Liang, P. Foytik, S. Shetty and K. D. Zoysa, "A Blockchain and Self-Sovereign Identity Empowered Digital Identity Platform," *2021 International Conference on Computer Communications and Networks (ICCCN)*, 2021
46. P. Foytik, S. Shetty, S. P. Gochhayat, E. Herath, D. Tosh and L. Njilla, "A Blockchain Simulator for Evaluating Consensus Algorithms in Diverse Networking Environments," *2020 Spring Simulation Conference (SpringSim)*, Fairfax, VA, USA, 2020, pp. 1-12
47. Eranga Bandara, Xueping Liang, Sachin Shetty, Wee Keong Ng, Peter Foytik, Nalin Ranasinghe, Kasun De Zoysa, Bård Langöy, David Larsson, "Lekana - Blockchain Based Archive Storage for Large-Scale Cloud Systems", ICBC 2020: 169-184
48. Sachin Shetty, Indrajit Ray, Nurcin Celik, Michael Mesham, Nathaniel Bastian, Quanyan Zhu, "Simulation for Cyber Risk Management - Where are we, and Where do we Want to Go? ", Wintersim Simulation Conference, 2019
49. Sarada Prasad Gochhayat, Eranga Herath, Sachin Shetty, Peter Foytik "Yugala: Blockchain based Encrypted Cloud Storage for IoT Data", IEEE Blockchain, 2019
50. Deepak Tosh, Sachin Shetty, Peter Foytik, Laurent Njilla, Charles Kamhoua, "Blockchain Empowered Secure Internet-of-Battlefield Things (IoBT) Architecture", Milcom, Los Angeles, October 2018.
51. Deepak Tosh, Sachin Shetty, Peter Foytik, Charles Kamhoua, Laurent Njilla, "CloudPoS: A Proof-of-Stake Consensus Design for Blockchain Integrated Cloud", IEEE International Conference on Cloud Computing (Cloud 2018), July 2-7, 2018, San Francisco, CA, USA, August 2018 (Acceptance ratio: 15 %)
52. Xueping Liang, Sachin Shetty, Deepak Tosh, Yafei Ji, Danyi Li, "Towards a Reliable and Accountable Cyber Supply Chain in Energy Delivery System using Blockchain", 14th EAI International Conference on

Security and Privacy in Communication Networks (SecureComm), August 2018 (Acceptance ratio: 30.5%=33/108)

53. Xueping Liang, Sachin Shetty, Juan Zhao, Daniel Bowden, Danyi Li and Jihong Liu, "Towards Decentralized Accountability and Self-Sovereignty in Healthcare Systems," The 19th International Conference on Information and Communications Security (ICICS 2017), Beijing, China, Dec 2017
54. Xueping Liang, Sachin Shetty, Deepak Tosh, Peter Foytik and Lingchen Zhang, "Towards a Trusted and Privacy Preserving Membership Service in Distributed Ledger using Intel Software Guard Extensions," The 19th International Conference on Information and Communications Security (ICICS 2017), Beijing, China, Dec 2017
55. Deepak Tosh, Sachin Shetty, Xueping Liang, Charles A. Kamhoua, Laurent Njilla, "Consensus Protocols for Blockchain-based Data Provenance: Challenges and Opportunities," 2017 IEEE 8th Annual Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON) (Short Paper), NY, October 19-21, 2017
56. Deepak Tosh, Iman Vakilinia, Sachin Shetty, Shamik Sengupta, Charles A. Kamhoua, Laurent Njilla, Kevin Kwiat , "Three Layer Game Theoretic Decision Framework for Cyber-Investment and Cyber-Insurance," GameSec 2017, 8th Conference on Decision and Game Theory for Security, Vienna, Austria, October 23-25, 2017
57. Xueping Liang, Juan Zhao, Sachin Shetty, Jihong Liu, Danyi Li, "Integrating Blockchain for Data Sharing and Collaboration in Mobile Healthcare Applications," IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, 08-13 October 2017, Montreal, QC, Canada
58. Xueping Liang, Juan Zhao, Sachin Shetty, Danyi Li, "Towards Data Assurance and Resilience in IoT Using Distributed Ledger," IEEE Milcom, October 23-25, 2017, Baltimore, MD, USA
59. Juan Zhao, Sachin Shetty, Jan Wei Pan, "Feature-Based Transfer Learning for Network Security," IEEE Milcom, October 23-25, 2017, Baltimore, MD, USA
60. Xueping Liang, Sachin Shetty,Deepak Tosh, Charles Kamhoua, Kevin Kwiat, Laurent Njilla, "ProvChain: A Blockchain-based Data Provenance Architecture in Cloud Environment with Enhanced Privacy and Availability", The 17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID), May 14-17 2017.
61. Deepak Tosh Sachin Shetty, Xueping Liang, Charles Kamhoua, Kevin Kwiat, Laurent Njilla, "Security Implications of Blockchain Cloud with Analysis of Block Withholding Attack", 17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID), May 14-17 2017.
62. Sachin Shetty, Val Red, David Satterfield, Charles Kamhoua, Kevin Kwiat and Laurent Njilla, "Data Provenance Assurance in Cloud Using Blockchain", SPIE Defense + Security Conference, Anhaeim CA, April 9-13, 2017.

Grants Awarded

Awards during July 24, 2016 – at Old Dominion University (~ 22 million)

1. ***Project Title –*** 5G RDT&E Testbed for Radar Coexistence and Kinetic Effects
   - **Funding agency** – HII
   - **Project description** – Development for 5G testbed to assess and evaluate interference to radar systems.
   - **Role** – PI (Sachin Shetty)
   - **Period** – April 16, 2024 – April 15, 2025
2. ***Project Title –*** Cybersecurity Center for Offshore Wind Energy
   - **Funding agency** – SERC
   - **Project description** – Demonstrate side channel attacks on wind energy
   - **Role** – PI (Sachin Shetty)
   - **Period** – April 16, 2024 – April 15, 2025
3. ***Project Title –*** Center for Offshore Wind Energy Cyber Vulnerabilities
   - **Funding agency** – Department of Energy
   - **Project description** – Develop testbed and demonstrate side channel attacks on wind energy
   - **Role** – PI (Sachin Shetty)
   - **Period** – April 1, 2024 – March 31, 2025

4. ***Project Title –*** Cybersecurity Readiness for Small Business
   - **Funding agency** – Small Business Administration
   - **Project description** – Develop cyber security training to assist small businesses meet cyber readiness
   - **Role** – PI (Sachin Shetty)
   - **Period** – Sep 1, 2023 – August 29, 2025
5. ***Project Title –*** Efficient Data Communication and Processing for Intelligent Medical Systems with Edge-Cloud Interplay
   - **Funding agency** – National Science Foundation
   - **Project description** – Develop an edge-cloud interplay platform to realize efficient data communication and processing for Intelligent Medical Systems.
   - **Role** – PI (Sachin Shetty)
   - **Period** – Sep 1, 2022 – August 29, 2025
6. ***Project Title –*** Privacy Preserving Federated Machine Learning Model
   - **Funding agency** – Deloitte Consulting
   - **Project description** – Design and develop a privacy preserving federated machine learning model
   - **Role** – PI (Sachin Shetty)
   - **Period** – August 1, 2023 – July 30, 2024
7. ***Project Title –*** Deception for characterizing adversarial strategies in complex networked systems.
   - **Funding agency** – Army Research Office
   - **Project description** – Design and develop techniques to place and deploy honeypots to increase the cost for adversaries to compromise networked systems.
   - **Role** – PI (Sachin Shetty)
   - **Period** – July 1, 2023 – June 30, 2025
8. ***Project Title -*** Advancements in low latency, resilient and energy efficient 5G networks for smart warehouse
   - **Funding agency** – National Spectrum Consortium
   - **Project description** – Develop resilient distributed positioning network and distributed coherent MIMO for 5G enabled smart warehouse.
   - **Role** - PI
   - **Amount–** $898,725
   - **Period** – Jan 1, 2021 – December 31, 2023
   - **Faculty Share**– 50 %
9. ***Project Title –*** Center of Excellence in Machine Learning
   - **Funding agency** – Department of Defense
   - **Project description** – Design and develop trustworthy machine learning techniques
   - **Role** - PI
   - **Amount–** $1,750,000
   - **Period** – October 1, 2020 – September 31, 2025
   - **Faculty Share**– 50 %
10. ***Project Title -*** Top Down 5G Network Security Design
    - **Funding agency** – Deloitte Consulting
    - **Project description** – Design and develop a Blockchain enabled platform for zero trust security.
    - **Role** - PI
    - **Amount–** $50,000
    - **Period** – May 1, 2021 – December 31, 2021
    - **Faculty Share**– 50 %
11. ***Project Title -*** Cybersecurity Monitoring and Assurance Training Program for Safe and Secure Port Operations
    - **Funding agency** – Commonwealth Cyber Initiative
    - **Project description** – Design and develop learning modules for a secure SOC for Port of Virginia
    - **Role** - PI

- **Amount–** $150,000
- **Period** – May 1, 2021 – August 31, 2022
- **Faculty Share**– 50 %

12. ***Project Title -*** Moving Choreography to a New Universe: AI Driven Privacy Automation Approach
    - **Funding agency** – Commonwealth Cyber Initiative
    - **Project description** – Design and develop AI enabled techniques for privacy preservation during collecting data on dance movements
    - **Role** – Co-PI
    - **Amount–** $25,000
    - **Period** – January 1, 2021 – August 31, 2021
    - **Faculty Share**– 50 %
13. ***Project Title -*** Question Under Discussion Framework to Analyze Misinformation targeting Security Researchers
    - **Funding agency** – Commonwealth Cyber Initiative
    - **Project description** – Design and develop techniques to detect indicators of misinformation in social media
    - **Role** – PI
    - **Amount–** $65,000
    - **Period** – June 1, 2021 – May 30, 2022
    - **Faculty Share**– 50 %
14. ***Project Title -*** Secure and Privacy Preserving 5G Network for Connected Vehicles
    - **Funding agency** – Commonwealth Cyber Initiative
    - **Project description** – Design and develop secure and privacy preserving 5G platform for transportation.
    - **Role** – PI
    - **Amount–** $200,000
    - **Period** – January 1, 2021 – May 31, 2022
    - **Faculty Share**– 50 %
15. ***Project Title -*** Analytically-based frameworks for AI model verification and improvement in cyber-physical systems
    - **Funding agency** – National Science Foundation
    - **Project description** – Design and develop physics guided machine learning for CPS.
    - **Role** – PI
    - **Amount–** $60,000
    - **Period** – October 15, 2021 – September 30, 2023
    - **Faculty Share**– 50 %
16. ***Project Title -*** Extended Reality enabled 5G Telementoring
    - **Funding agency** – Hampton Roads Biomedical Research Consortium
    - **Project description** – Design and develop a 5G enabled mixed reality prototype for telehealth mentoring.
    - **Role** - PI
    - **Amount–** $115,000
    - **Period** – October 1, 2021 – June 30, 2022
    - **Faculty Share**– 50 %
17. ***Project Title -*** Bulk Electric Systems Supply Chain Cyber Risk Management
    - **Funding agency** – Cyber Resilient Energy Delivery Consortium
    - **Project description** – Design and develop techniques for assessing cyber risk for assets in bulk electric power systems
    - **Role** - PI
    - **Amount–** 317,000
    - **Period** – June 1, 2020 – May 31, 2022
    - **Faculty Share**– 100 %
18. ***Project Title -*** *AI Model Certification in Operational Environments,*

- **Funding agency** – MITRE
- **Project description** – Development of AI assurance techniques to certify operating envelope
- **Role** - PI
- **Amount–** 66,000
- **Period** – May 1, 2020 – September 30, 2020
- **Faculty Share**– 100 %

19. ***Project Title -*** *Blockchain-Empowered Cyber-Resilient IoT Security Solution*
    - **Funding agency** – CIT
    - **Project description** – Commercialization of Blockchain empowered medical device security prototype
    - **Role** - PI
    - **Amount–** 150,000
    - **Period** – July 1, 2020 – June 30, 2022
    - **Faculty Share**– 100 %
20. ***Project Title –*** *Advanced Instrumentation Technology Spectrum Risk Assessment*
    - **Funding agency** – Circadence
    - **Project description** – Development of spectrum risk assessment techniques for a Live Virtual Construtive environment.
    - **Role** - PI
    - **Amount–** 297,900
    - **Period** – July 24, 2020 – January 21, 2022
    - **Faculty Share**– 100 %
21. ***Project Title -*** *Blockchain Empowered Provenance Framework for Sensor Identity Management and Data Flow Security in Fossil-Based Power Plants", Department of Energy*
    - **Funding agency** – Department of Energy
    - **Project description** – Blockchain empowered provenance platform for identity management and process integrity for sensors in *Fossil-based Power Plants (**FPP**)*.
    - **Role** - PI
    - **Amount–** 400,000
    - **Period** – September 1, 2019 – August 31, 2022
    - **Faculty Share**– 100 %
22. ***Project Title -*** Attack Graph Modeling and Risk Remediation Plan
    - **Funding agency** – Electric Power Research Institute
    - **Project description** – Attack graph based modeling to identify stepping stones and proposed cyber risk remediation plan.
    - **Role** - PI
    - **Amount–** 75,000
    - **Period** – October 1, 2019 – September 30, 2020
    - **Faculty Share**– 100 %
23. ***Project Title -*** *Cyber Risk and Resilience Analytics*
    - **Funding agency** – *Frontier Technology Inc*
    - **Project description** – To provide a suite of cyber risk and resilience metrics to estimate incurred cost to defender, induced cost to attacker and aid in development of cyber defense remediation plan.
    - **Role** - PI
    - **Amount–** 680,583
    - **Period** – March 15, 2019 – September 30, 2021
    - **Faculty Share**– 60 %
24. ***Project Title -*** Cyber Risk Scoring and Mitigation
    - **Funding agency** – Commonwealth Research Commercialization Fund
    - **Project description** – Develop Cyber Risk Scoring and Mitigation for security scoring and prioritized risk remediation plan for healthcare.
    - **Role** - PI

- **Amount–** 100,000
- **Period** – July 1, 2018 – June 30, 2019
- **Faculty Share**– 100 %

25. ***Project Title -*** Networked Device Identity Management using Blockchain
    - **Funding agency** – Sentara Healthcare
    - **Project description** – Develop security monitoring solutions to identify and detect presence of rogue devices in Sentara Healthcare's cyber infrastructure
    - **Role** - PI
    - **Amount–** 767,000
    - **Period** – January 1, 2018 – December 31, 2020
    - **Faculty Share**– 100 %
26. ***Project Title -*** **Data provenance Assurance in Cloud using Blockchain**
    - **Funding agency** – Air Force Research Laboratory
    - **Project description** – Develop a Blockchain platform capable of providing a trusted framework for distributed entities in constrained and congested computing and networking environments
    - **Role** - PI
    - **Amount–** $1,050,000
    - **Period** – August 18, 2016 – December 31, 2019
    - **Faculty Share**– 100 %
27. ***Project Title -*** Center of Excellence in Cyber Security
    - **Funding agency** – Air Force Research Laboratory
    - **Project description** – Develop basic research techniques for realizing cyber defense in cloud and mobile environments.
    - **Role** – Co-PI
    - **Amount–** $4, 984,352
    - **Period** – July 24, 2016 – May 31, 2021
    - **Faculty Share**– $712,054
28. ***Project Title -*** Towards Community Resilience through Comprehensive Risk Assessment for Business Continuity
    - **Funding agency** – Department of Homeland Security Critical Infrastructure Resilience Institute
    - **Project description** – Economic modeling and cyber risk management to measure and price cyber risk and develop prioritized mitigation plan
    - **Role** – PI
    - **Amount–** $372,977
    - **Period** – July 24, 2016 – June 30, 2020
    - **Faculty Share**– 100%
29. ***Project Title -*** Cyber Resilient Energy Delivery Consortium
    - **Funding agency** – Department of Energy
    - **Project description** – Development of cyber resilient techniques to ensure cyber survivability of power systems and oil and gas refineries.
    - **Role** – Site Lead
    - **Amount–** $28.1 Million
    - **Period** – July 24, 2016 – May 31, 2022
    - **Faculty Share**– $1,028,557

Awards during June 1, 2009 – July 1, 2016 at Tennessee State University

30. ***Project Title -*** **CC*DNI Campus Design: Internet2 Infrastructure to Enable Research in Big Data Science and Engineering at Tennessee State University**
    - **Funding agency** – National Science Foundation
    - **Project description** – Instrumentation of Internet2 Infrastructure and integration with cloud computing environment to enhance outcomes of cyber security research projects.
    - **Role** – PI
    - **Amount–** $349,144
    - **Period** – January 1, 2016 – July 1, 2016

- **Faculty Share**– 100%

31. ***Project Title -*** Defenses and countermeasures of jamming attacks in wireless mesh networks
    - **Funding agency** – Naval Engineering Education Consortium
    - **Project description** – Development of machine learning techniques to defend against jamming attacks in wireless networks
    - **Role** – PI
    - **Amount–** $449,934
    - **Period** – March 14, 2016 – July 1, 2016
    - **Faculty Share**– 100%
32. ***Project Title -*** Embedded Systems Security Education
    - **Funding agency** – Office of Naval Research
    - **Project description** – Development of training platform for cyber defense in embedded systems
    - **Role** – PI
    - **Amount–** $599,800
    - **Period** – August 1, 2015 – July 1, 2016
    - **Faculty Share**– 100%
33. ***Project Title -*** Blue-Shirt Program: Engineering Clinic-Based Curriculum
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of clinic-based curriculum for College of Engineering at Tennessee State University
    - **Role** – Co-PI
    - **Amount–** $1,904,891
    - **Period** – July 1, 2015 – June 30, 2020
    - **Faculty Share**– 40%
34. ***Project Title -*** A Research Infrastructure for Real-time Opportunistic Spectrum Access in Cloud based Cognitive Radio Networks
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of cognitive radio testbed to realize dynamic spectrum access.
    - **Role** – PI
    - **Amount–** $88,119
    - **Period** – August 1, 2014 – July 31, 2017
    - **Faculty Share**– 100%
35. ***Project Title -*** IUSE – Collaborative Project: Building Virtual Research, Interactive Service and Experiential Learning Modules for Cybersecurity
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of learning modules for cybersecurity
    - **Role** – PI
    - **Amount–** $108,262
    - **Period** – August 1, 2014 – July 31, 2017
    - **Faculty Share**– 100%
36. ***Project Title -*** Scholarships for preparing the global engineer for tomorrow's workforce
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of scholarship program for undergraduates
    - **Role** – PI
    - **Amount–** $600,000
    - **Period** – July 1, 2013 – June 30, 2016
    - **Faculty Share**– 50%
37. ***Project Title -*** Collaborative Project: Building an Innovative Smartphone Virtual Laboratory Environment for Cybersecurity Education and Training
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of training modules for smartphone security
    - **Role** – PI

- **Amount–** $93,093
- **Period** – August 1, 2013 – July 31, 2016
- **Faculty Share**– 100%

38. ***Project Title -*** Development of an agile and resilient security architecture to protect embedded systems from emerging threats
    - **Funding agency** – Boeing
    - **Project description** – Development of cyber resilient techniques for CPS security
    - **Role** – PI
    - **Amount–** $450,000
    - **Period** – November 1, 2012 – December 31, 2015
    - **Faculty Share**– 50%
39. ***Project Title -*** Heterogeneous VM Replication- A new approach to intrusion detection, active response and recovery in cloud data centers
    - **Funding agency** – Air Force Office of Scientific Research
    - **Project description** – Development of VM replication techniques for cloud security
    - **Role** – Co-PI
    - **Amount–** $750,000
    - **Period** – December 1, 2011 – December 31, 2014
    - **Faculty Share**– 50%
40. ***Project Title -*** Secure Measurement based IP Geolocation for Cloud Auditing
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of machine learning techniques for protecting data in cloud
    - **Role** – PI
    - **Amount–** $250,000
    - **Period** – September 1, 2011 – August 31, 2013
    - **Faculty Share**– 100%
41. ***Project Title -*** Network Measurement and Mapping
    - **Funding agency** – Department of Homeland Security
    - **Project description** – Development of machine learning techniques for network measurement and mapping
    - **Role** – PI
    - **Amount–** $500,000
    - **Period** – September 1, 2011 – August 31, 2016
    - **Faculty Share**– 50%
42. ***Project Title -*** Targeted Infusion Grant- Cybersecurity education and research training for ECE and CS programs
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of learning modules to enhance cybersecurity capacity.
    - **Role** – Co-PI
    - **Amount–** $300,000
    - **Period** – October 1, 2011 – September 30, 2015
    - **Faculty Share**– 50%
43. ***Project Title -*** Vertical Integration of Concepts and Laboratory Experiences in Biometrics across the Four Year Electrical and Computer Engineering Curriculum
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of learning modules for biometric security
    - **Role** – PI
    - **Amount–** $131,080
    - **Period** – October 1, 2014 – July 1, 2016
    - **Faculty Share**– 50%
44. ***Project Title -*** Visual Analytics for Anomaly Detection
    - **Funding agency** – Department of Homeland Security
    - **Project description** – Development of techniques for security visualization

- **Role** – PI
- **Amount–** $300,000
- **Period** – February 1, 2011 – July 30, 2016
- **Faculty Share**– 100%

45. ***Project Title -*** CI-TEAM Demonstration: Interactive and Collaborative Learning Environment using Virtual Reality Games Promoting Metacognition for Science and Engineering Design in Context
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of virtual reality techniques for learning engineering concepts.
    - **Role** – Co-PI
    - **Amount–** $250,000
    - **Period** – September 1, 2010 – August 31, 2015
    - **Faculty Share**– 50%
46. ***Project Title -*** Empowering Students with Engineering Literacy and Systematic Problem Solving through Interactive and Cost-Effective Games,"
    - **Funding agency** – National Science Foundation
    - **Project description** – Development of games for engineering education.
    - **Role** – Co-PI
    - **Amount–** $199,986
    - **Period** – September 1, 2009 – August 31, 2013
    - **Faculty Share**– 50%

Research Papers Presented at Professional Meetings

1. Quantum and NextG Challenges and Opportunities, Presented at QED consortium and IEE SIG, 2022
2. Spectrum Sharing Technologies- Where we are and Future Challenges, National Spectrum Consortium, December 15, 2021
3. George Mason, Cyber security engineering, CYSE 610: Networks and Cybersecurity" Nov. 3, 2021
4. International Conference on Software Security and Assurance, November 10, 2021 (virtual)
5. Resilience Week Panel on Supply Chain Security for Industrial Control Systems, October 20, 2021
6. Misinformation Workshop, CCI, October 10, 2021
7. Marine Corps 5G Community of Interest, July 10, 2021
8. Stevens Institute of Technology, ECE Department, February 24, 2021
9. Ecommerce Operations Summit, August 31, 2021
10. Cyber Risk Scoring and Mitigation for Critical Infrastructure, Center for Energy, Environmental, and Economic Systems Analysis Fall Seminar Series on Energy Systems and Cybersecurity, Argonne National Lab, October 2, 2020
11. Internet of Medical Things, Health Utility Grid Standards, Global Collaboration and Harmonization for Digital Transformation in Health care, Global Science Collaboration, 75th United Nations General Assembly (UNGA75), October 1, 2020
12. Artificial Intelligence for Drone Detection, Remote Experiences for Young Engineers and Scientists (REYES), June 26, 2020
13. Cyber Risk Scoring and Mitigation, NASA Langley, March 24, 2020
14. Panel: Industrial IOT security, CREDC Industry Workshop, February 12, 2020
15. Proactive Cyber Risk Management in Industrial Internet of Things, CREDC Industry Workshop, February 12, 2020
16. Cyber Risk Scoring and Mitigation, Turbo Transition, US Transcom, June 2019
17. Blockchain for Distributed Systems Security Symposium, Army Research Lab, Adelphi, MD, February 5, 2019
18. Cyber Risk Scoring and Mitigation, Purdue Northwest University Seminar, February 8, 2019
19. Bloxure Presentation and Demonstration, HIMSS, Feb 10-14, 2019
20. A Proof-of-Stake Consensus Design for Blockchain Integrated Cloud, Applications and Barriers to Consensus Protocols Workshop, DARPA, February 15, 2019 (**Competitive Selection**)
21. Panel Discussion - Leading Cybersecurity: Planning for Data Privacy and Security, Healthcare Administrators of Tidewater, February 27, 2019

22. Cyber security research, Air Force Institute of Technology, January 23-24, 2019
23. GNU Radio empowered RF Classification toolbox, Counter UAS Tech Exchange Meeting, John Hopkins University, January 16, 2019
24. "Blockchain & AI Technology: New Tools for Cyber Defense", AAAE/Planet Defense Aviation Cybersecurity Workshop, Arlington, VA, December 23, 2018
25. "Cyber Risk Scoring and Mitigation for Resilient Cyber Infrastructure", University of Illinois ITI/CIRI Webinar Series, December 13, 2018
26. "Transfer Learning for Detecting Unknown Attacks in Autonomous", Workshop on Autonomous Cyber Operations, Baltimore, Maryland, November 5-6 2018 (**Competitive Selection**)
27. Panel Talk, "How to become a skilled researcher", Career Pathways, November 2, 2018
28. "Blockchain and Process Control Systems Security", S*upply Chain Cybersecurity & Cloud-based Services Workshop*, October 23, 2018, FortWorth, Texas.
29. "Cyber Resilience Metrics", EPRI Webinar, October 18, 2018
30. "Blockchain Research Overview", ODU CyberOps, October 19, 2018
31. Panel Discussion, "Real-World Look at Blockchain- Its hear to stay", WEDI Blockchain Conference, Arlington, VA, October 15-17, 2018
32. "Blockchain for Cyber Supply Chain Provenance", AFPM/OPCAT Cybersecurity Conference, Atlanta, GA, October 1, 2018 (**Competitive Selection**)
33. "Blockchain for Energy Delivery Systems", Argonne National Laboratory (ANL) DOE CEDS Outreach Energy Sector Industry Advisory Team (IAT), Third Quarter Teleconference Call, September 18, 2018.
34. "Blockchain and IoT Security", VA-DC HFMA Fall Education Conference, September 19-21, 2018, Virginia Beach, VA
35. "Showcase- Academia and Industry Partnership – Cyber Resilience Metrics", DoE CREDC Industry Workshop, Boston, MA, September 11-13, 2018 (**Competitive Selection**)
36. "Blockchain and Cyber Security", ODU NSA project on Blockchain and Cybersecurity, August 27, 2018
37. "Cyber Risk Scoring and Mitigation", US PACOM Webinar, May 17, 2018
38. Panel Discussion, "Blockchain and Cyber Security, VA HIMMS, April 27, 2018
39. "Cyber Risk Scoring for Wireless Systems", C-UAS and JCREW Advanced Techniques Development Technical Exchange Meeting, Crane Indiana, March 12-15, 2018
40. Panel Discussion, "Hybrid Simulation for Cyber Physical Systems – A Panel on where are we going regarding complexity, intelligence and adaptability of CPS using Simulation", April 15, 2018, SpringSim Conference (**Competitive Selection**)
41. ODU Cyber security Outreach, Southampton County Public Schools, CTE Cyber Security Career Expo: February 28, 2018
42. "Blockchain for Healthcare Security", Healthcare Informatics, Health IT Summit, San Diego, CA, Feb 1, 2018
43. "Blockchain empowered cyber threat sharing platform", US Transcom, December 2017
44. "Provchain- A blockchain based data provenance for cloud computing", MITRE, November 2017
45. "Blockchain and Data Provenance", CERDEC, November 2017
46. "Blockchain based Trusted Information Sharing", NATO Workshop, October 2017
47. "Networked Identity Management of Internet of Things using Blockchain", AFPM Cyber security seminar, September 2017 (**Competitive Selection**)
48. "Blockchain in Healthcare- A Marriage of Hype and Promise", Healthcare Security Forum, HIMMS, Sep 2017
49. "Data Provenance Assurance using Blockchain in Cloud Environment", UTRC, March 2017
50. "Blockchain for Cloud Security", Air Force Space Command, January 2017.
51. "Towards Network Aware VM Migration – Evaluating the Cost of VM Migration in SDN-based Cloud Computing Network", Workshop on Science of Security through Software-Defined Networking, Illinois Institute of Technology, Chicago, IL, June 2016 (**Competitive Selection**)
52. "Moving Target Defense to protect Cloud DataCenters", University of Toledo, October 2015.
53. "Moving Target Defense", Derbycon, September 2015. (**Competitive Selection**)
54. "Moving Target Defense", Summer School, COINS Research Lab, Greece, August 2015 (**Competitive Selection**)

Honors, Awards, and Prizes

- University Eminent Scholar, Old Dominion University, 2026 (ODU's highest faculty distinction)
- Appointed to TowneBank Corporate Board of Directors, 2024
- ODU Graduate Commencement Speaker
- Commonwealth Cyber Initiative (CCI) Impact Award, 2023
- Top 2% Cited Researcher for 2021
- Fulbright Specialist
- Commonwealth Cyber Initiative Fellow
- Electric Power Research Institute Research Challenge Award
- Top 50 Blockchain Academic Research Paper Award
- 2016 TSU Million Dollar Club
- Three-time winner of the TSU Faculty Research Mentorship Award (2013, 2014, 2015)

Membership in Professional Societies
- Senior Member, the Institute of Electrical and Electronics Engineers (IEEE).

University Service
- Member of the Department of Computational Modeling and Simulation Engineering Tenure and Promotion Committee, 2016- present
- Member of the ODU's HPC Advisory Committee, 2018- present
- Member of Coastal Virginia's CCI Node Research Committee, 2019- present
- Member of the ODU's Career Pathways Steering Committee, 2017- present
- Member of the ODU's BCET Dean Search Committee, 2019
- Member of the ODU's BCET Associate Dean for Research and Graduate Programs Search Committee, 2017
- Serving as a member of the Tennessee State University Faculty Senate, 2014- 2017
- Serving as a member of the Tennessee State University Faculty Senate Research Committee, 2013- 2016

Professional Service

1. **Standard Committee Co-chair**
    a. Subgroup chair on Internet of Medical Things in the IEEE P2418.6 Standards Development Working Group (Blockchain in Healthcare and Life Sciences) - https://sagroups.ieee.org/2418-6/subgroups/
2. **Journal Editor**
    a. Serving on Editorial Board for EAI Endorsed Transactions for Security and Safety - https://eudl.eu/journal/sesa
    b. Serving as Guest Editor for IEEE Internet of Things Journal Special Issue on "Secure Data Analytics for Emerging Internet of Things"
3. **Commonwealth Cyber Initiative Activities**
    a. Served on a committee responsible for creation of CCI AI Assurance Testbed Course of Action.
    b. Served on a panel for building bridges between arts and design community and cybersecurity, 2020
    c. Organize the CCI's Virtual Summer Academy on AI Assurance in Summer 2020.
4. **Panels**
    a. Served on the panel for NSF CNS, NSF CPS, NSF CSR, NSF DUE and NSF HRD programs
    b. Moderated panel on Smart Cities at Commonwealth Conference on National Defense and Intelligence, 2019
    c. Moderated panel on Industrial IoT Security, CREDC Industry Workshop, 2020
    d. Moderated panel on "Simulation for Cyber Risk Management - Where are we, and Where do we Want to Go? ", Wintersim Simulation Conference, 2019
5. **Conference Track Chair**
    a. Serving as track chair for Communication and Networks Symposium, SmartGridComm 2020

b. Serving as area chair for Security, Privacy, Trust and Incentives at ICCCN 2020
c. Serving as chair for cyber risk track at WinterSim 2020
d. Serving as chair for cybersecurity engineering track at SpringSim2019 and SpringSim 2020

6. **Workshop Chair**
   a. Served as chair for 2nd IEEE Workshop on Security Trust Privacy in Emerging Cyber-Physical Systems (STP-CPS) held in conjunction with 17th IEEE SECON 2020
   b. Served as chair for the workshop on Security Trust and Privacy in Emerging Cyber-Physical Systems held in conjunction with SECON 2019
   c. Served as chair for the 1st Light Chain workshop held in conjunction with IEEE Blockchain, Atlanta, 2019
   d. Organized workshop on Blockchain for Cyber Threat Information Sharing for NATO Innovation Hub, 2018
   e. Served as chair for the 1st International Workshop on BLockchain Enabled Sustainable Smart Cities (BLESS 2018), Kansas City, MO, USA, Sept. 19, 2018 In Conjunction with the 4th IEEE Annual International Smart Cities Conference (ISC2 2018)
   f. Served as chair for the 2nd and 3rd International Workshop on BLockchain Enabled Sustainable Smart Cities (BLESS 2019 and BLESS 2020), Casablanca, Morocco, October 14, 2019, held in conjunction with the 5th IEEE Annual International Smart Cities Conference (ISC2 2019)

7. **Selected Technical Program committee**
   - IEEE International Conference on Communications (ICC): Communication and Information Systems Security Symposium, 2020
   - IEEE International Conference on Computing, Networking and Communications, 2020
   - IEEE International Conference on Distributed Computing and Networking, 2020, 2019, 2016
   - ACM SIGSIM Conference on Principles of Discrete Simulation (PADS), 2019, 2020
   - IEEE Cloud Summit, 2019
   - EAI SecureComm, 2019
   - EAI International Conference on Cloud Computing, 2018
   - International Conference on IOT, 2016
   - IEEE International Conference on Computer Communication and Networks, 2016, 2015
   - IEEE Globecom, 2015
   - IEEE Consumer Communications and Networking Conference, 2015

8. **Selected Journal/Conference Reviewer**
   a. ACM CCS, ICDCN, ICC, CNS, ICCCN, INFOCOM, LCN, WCNC, GlobeCom, Milcom, ICDCN, ICCCN
   b. IEEE Transactions Journals, such as, Transactions on Networking, Transactions on Parallel and Distributed Systems, Transactions on Wireless Communications, Transactions on Vehicular Technology. ACM Transactions on Simulation, IEEE Transactions on Cyber Physical systems, IEEE Transactions on Industrial Informatics, IEEE Internet of Things Journal, IEEE Transactions on Engineering Management