Gaurav Panwar

Assistant Professor, Department of Computer Science, College of Arts and Sciences, New Mexico State University (NMSU). Office: Science Hall - RM 160, 1290 Frenger Mall, Las Cruces, NM - 88003

EDUCATION

Doctor of Philosophy (2017 - 2023)

Department of Computer Science New Mexico State University Major: Computer Science **Thesis**: Cryptographic Designs for Building Trustworthy and Verifiable Decentralized Processes. GPA: 3.855.

Master of Science (2014 - 2017)

Department of Computer Science New Mexico State University Major: Computer Science **Thesis**: Balanced and Adaptive Multi-RAT Forwarding Strategy for Information Centric Networks in 5G. GPA: 3.829.

Bachelor of Technology (2009 - 2013)

Mahatma Gandhi Institute of Technology Major: Electronics and Communication Engineering **Major Project**: Autonomous Metro Train **Minor Project**: GSM Anti-Theft Tracking System for Vehicles

QUALIFICATION SUMMARY

My research interests are in networking, security, privacy, distributed systems, and cryptography with focus on:

- $\triangleright \quad \text{Improvement to Blockchain technology, its applications and leveraging it in novel applications.}$
- ▷ Theoretical and applied aspects of cryptography.
- ▷ Security, Privacy, and efficiency in information-centric networks and other future internet architectures, IoT networks, smart grid technologies and distributed systems.
- ▷ Design, implementation and deployment of Wireless Sensor Networks and Micro-controller based projects.

Research Highlights: I have co-authored multiple refereed and peer-reviewed papers published in International Conferences and Journals, spanning multiple research domains. The relevance of my research is reflected by the cumulative peer-citation count of 328. My works have been published in prestigious peer reviewed journals and conferences (acceptance rates < 25%), such as ACM Computer and Communications Security (CCS) '2019, '2021, ACM SACMAT '2021, IEEE Communications on Surveys and Tutorials '2018, ACM Conference on Data and Application Security and Privacy (CODASPY) '2019, and IEEE Sensors Journal '2019.

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EMPLOYMENT HISTORY

Tenure Track Assistant Professor

Computer Science Department - New Mexico State University

(August 2023 - Present)

Teach undergraduate and graduate courses in computer science and cybersecurity, and develop new courses with a focus on new research areas and upcoming technologies. Conduct research in cybersecurity and computer science, with a focus on networking, security, privacy, distributed systems, and cryptography. Investigate new and upcoming areas of research and collaborate with researchers across the university and other institutions and industry. Supervise graduate students and postdocs in their research. Publish research papers in top academic conferences and journals. Attend and present at academic conferences and workshops. Serve on the editorial and organizing committees of academic journals and conferences and help with peer reviews. Advise industry partners on cybersecurity and computer science matters. Disseminate research findings to the public through talks, presentations, and publications.

Senior Enterprise Network Programmer

Enterprise Network Engineering and Design - New Mexico State University

(March 2018 - August 2023)

Develop and maintain program interfaces to integrate 3rd party vendors software, programs, and/or services to the central enterprise network system. Develop custom programming interfaces to communicate with network appliances like firewalls, load balancers, and traffic shapers. Develop custom interfaces for monitoring systems to monitor and generate key performance metrics. Develop network software and reporting tools to manage and monitor the NMSU network. Design, develop, and maintain Enterprise AAA (Authentication, Authorization, and Accounting) systems, DHCP service and DNS (Domain Name Service). Create high availability/redundant mechanism for the AAA, NetReg, DHCP, and DNS for disaster recovery. Design, develop, and maintain interfaces to cloud computing services (Microsoft Azure, Google Cloud and Amazon AWS) and other initiatives as well as developing tools to support those systems. Administer and manage the load balancers which are used to distribute the operation load between the critical servers for learning management servers, web servers, application servers, and database servers.

Graduate Assistant, Network Programmer

Network Operations Center - New Mexico State University (Jan 2016 - March 2018)

Worked on developing new application program interfaces and with preexisting ones to gather data from different industry-standard IT infrastructure monitoring systems and pre-installed network services for overview of network operation and status.

Graduate Assistant, Web Master

International Border Programs Office, New Mexico State University

(June 2014 - March 2018)

In charge of Managing the website for International Border Programs office and other offices under it as well as helping with other technological solutions to aid in the smoother running of the office.

Teaching Assistant

Department of Computer Science - New Mexico State University

(Jan 2015 - May 2016) CS-493/503 Intro to Robotics, CS-474 Operating Systems, CS-478/579 Computer Security: Guided the students in projects undertaken during class and help with classroom instructions whenever needed. Projects involved the use of Parrot AR 2 Drones and Lego Mindstorm Kits as well as the use of simulators, along with other software-based projects.

Teaching Assistant

Klipsch School of Electrical and Computer Engineering - New Mexico State University (Aug 2014 - Dec 2014)

EE-469 Digital Communications Networks: In-charge of instructing the students in the lab utilizing the Riverbed Modeler, covering classes for the professor, grading, and proctoring the exams.

TEACHING HISTORY

Courses Taught

- CS 496/522: Cloud Computing
- CS 480: Linux System Administration
- CS 479/579: Mobile and Wireless Computing

Courses Assisted

- CS 493/503: Intro to Robotics
- CS 474: Operating Systems
- CS 489/579: Computer Security
- EE 469: Digital Communications Networks

PATENTS

Non-Provisional (Full) Patent(s):

▷ U.S. Patent No. 11,323,489 | Scalable Auditability of Monitoring Process Using Public Ledgers.

Provisional Patent(s)/Application(s) under review for full patent:

▷ 37000.1908//U.S. Continuation Appl. 17/721,011 | Scalable Auditability of Monitoring Process Using Public Ledgers.

 $\triangleright~37000.2103//U.S.$ Application 17/683,050 Revocable and Traceable Blockchain Rewrites using Attribute-Based Cryptosystems.

PUBLICATIONS

Google Scholar: https://bit.ly/gpanwar-gscholar DBLP: https://bit.ly/gpanwar-dblp

Refereed Conference Papers

- Panwar, G., Vishwanathan, R., Torres, G., & Misra, S. (2023, August). SPRITE: Secure and Private Routing in Payment Channel Networks. In Proceedings of the 2024 ACM Asia Conference on Computer and Communications Security (ASIACCS).
- Dougherty, S., Tourani, R., **Panwar, G.**, Vishwanathan, R., Misra, S., & Srikanteswara, S. (2021, November). APECS: A distributed access control framework for pervasive edge computing services. *In Proceedings of the 2021 ACM SIGSAC Conference on Computer and Communications Security* (CCS) (pp. 1405-1420).

- Tran, C., Tourani, R., **Panwar, G.**, Misra, S., & Machacek, T. (2021, September). Analyzing GDPR compliance of named data networking. *In Proceedings of the 8th ACM Conference on Information-Centric Networking* (ICN) (pp. 107-117).
- Panwar, G., Vishwanathan, R., & Misra, S. (2021, June). ReTRACe: Revocable and traceable blockchain rewrites using attribute-based cryptosystems. In Proceedings of the 26th ACM Symposium on Access Control Models and Technologies (SACMAT) (pp. 103-114).
- Panwar, G., Vishwanathan, R., Misra, S., & Bos, A. (2019, November). Sampl: Scalable auditability of monitoring processes using public ledgers. In Proceedings of the 2019 ACM SIGSAC Conference on Computer and Communications Security (CCS) (pp. 2249-2266).
- Panwar, G., Misra, S., & Vishwanathan, R. (2019, March). Blanc: Blockchain-based anonymous and decentralized credit networks. In Proceedings of the Ninth ACM Conference on Data and Application Security and Privacy (CODASPY) (pp. 339-350).
- Panwar, G., Tourani, R., Mick, T., Misra, S., & Mtibaa, A. (2018, May). On implicit denial of service attack in NDN and potential mitigations. *In 2018 IEEE International Conference on Communications Workshops (ICC Workshops)* (ICN) (pp. 1-6). IEEE.
- Panwar, G., Tourani, R., Mick, T., Mtibaa, A., & Misra, S. (2017, August). DICE: Dynamic multi-RAT selection in the ICN-enabled wireless edge. In Proceedings of the Workshop on Mobility in the Evolving Internet Architecture (MOBIARCH) (pp. 31-36).

Refereed Journal Articles

- Panwar, G., Tourani, R., Mick, T., Mtibaa, A., & Misra, S. (2017). DICE: Dynamic Multi-RAT Selection in the ICN-enabled Wireless Edge. ACM SIGCOMM Computer Communication Review, 47(5), 67–72.
- Tourani, R., Misra, S., Mick, T., & Panwar, G. (2017). Security, privacy, and access control in informationcentric networking: A survey. IEEE Communications Surveys & Tutorials, 20(1), 566-600.
- Tang, W., Furth, P. M., Nammi, V. H., **Panwar, G.**, Ibarra, V., Tang, X., ... & Misra, S. (2019). An aquatic wireless biosensor for electric organ discharge with an integrated analog front end. **IEEE Sensors Journal**, 19(15), 6260-6269.

Refereed Conference Posters

- Panwar, G., Tourani, R., Misra, S., & Mtibaa, A. (2017, September). Request aggregation: the good, the bad, and the ugly. In Proceedings of the 4th ACM Conference on Information-Centric Networking (ICN) (pp. 198-199).
- Sariboz, E., Kolachala, K., **Panwar, G.**, Vishwanathan, R., & Misra, S. (2021, May). Off-chain execution and verification of computationally intensive smart contracts. *In 2021 IEEE International Conference on Blockchain and Cryptocurrency* (ICBC) (pp. 1-3). IEEE.

Book Reviews

• Misra, S., & **Panwar**, **G**. (2017). 5G Spectrum and Standards [Book Reviews]. *IEEE Wireless Communications*, 24(1), 4-5.

- Panwar, G., & Misra, S. (2017). Inside Bluetooth Low Energy (Gupta, N.)[Book Review]. *IEEE Wireless Communications*, 24(4), 2-3.
- Panwar, G., & Misra, S. (2016). Building Wireless Sensor Networks, Theoretical and Practical Perspectives (Nandini Mukherjee, Sarmistha Neogy, and Sarbani Roy; 2015)[Book Review]. *IEEE Wireless Communications*, 23(2), 4-5.
- Panwar, G., & Misra, S. (2016). Wireless Medical Systems and Algorithms: Design and Applications (Pietro Salvo and Miguel Hernandez-Silveira; 2016)[Book Review]. *IEEE Wireless Communications*, 23(4), 8-9.

REVIEWER

- IEEE Internet of Things 2020 (Journal)
- IEEE Communications Magazine (Journal)
- IEEE ICBC 2023 (Conference)
- IEEE ICBC 2022 (Conference)
- IEEE ICBC 2021 (Conference)
- IEEE Globecom 2021 IoTSN (Conference)
- IEEE Internet of Things 2021 (Journal)
- IEEE Globecom 2020 AHSN (Conference)
- IEEE International Conference on Communications Ad-hoc and Sensor Networking Symposium (2015)
- Transactions on Dependable and Secure Computing (Journal)
- IEEE Access 2021 (Journal)
- IEEE Transactions on Mobile Computing 2021 (Journal)
- IEEE Transactions on Mobile Computing 2022 (Journal)
- ACM Distributed Ledger Technologies 2021 (Journal)
- SECRYPT 2021 (Conference)
- IEEE International Performance, Computing, and Communications Conference 2017 (Conference)
- BLOCKCHAIN'22: 4th International Congress on Blockchain and Applications (Conference)
- IEEE Globecom 2022 IoTSN (Conference)
- IEEE Internet of Things 2022 (Journal)
- IEEE ICBC 2023 (Conference)
- BLOCKCHAIN'23: 5th International Congress on Blockchain and Applications (Conference)
- IEEE Transactions on Network Science and Engineering (Journal)
- IEEE Transactions on Mobile Computing 2024 (Journal)

- IEEE Transactions on Mobile Computing 2024 (Journal)
- Journal of Supercomputing 2024 (Journal)
- IEEE Globecom 2024 IoTSN (Conference)
- IEEE Internet of Things 2024 (Journal)
- BLOCKCHAIN'24: 6th International Congress on Blockchain and Applications (Conference)
- IEEE International Conference on Advanced Networks and Telecommunications Systems 2024 (Conference)

SERVICE TO UNIVERSITY

- Member of the core vision team of the NMSU High Performance Computing Advisory Council [2023-24].
- Member of ICT Security Team as a representative from College of Arts and Sciences [2023-24].
- Founder and faculty advisor of the NMSU Cybersecurity Club.

PROFESSIONAL SERVICES

- Member of Technical Program Committee, IEEE International Conference on Advanced Networks and Telecommunications Systems, 2024
- Member of Technical Program Committee, 6th International Congress on Blockchain and Applications, 2024
- Member of Technical Program Committee, 5th International Congress on Blockchain and Applications, 2023
- Member of Technical Program Committee, 4th International Congress on Blockchain and Applications, 2022
- Reviewer for multiple Conferences and Journals (See Reviewer section for list)

CONSULTING

• Subject Matter Expert and consultant to Arrowhead Innovation Center, NMSU.

PROFESSIONAL DEVELOPMENT

- Attended NSF SaTC Aspiring PI Workshop, [May 2024]
- Part of NMSU's first cohort of NMSU-MAS (Mejorando las Aulas en STEM/Improving STEM Classrooms) adding active learning techniques and activities to courses to improve student engagement and outcomes [Fall semester, 2023].
- Attended virtual workshop "Preparing Future Faculty", Auburn University [Sept, 2022].
- Attended workshop "The Power of We: Creating an Inclusive Classroom Together", Teaching Academy, NMSU [Jan-Feb, 2022].

AWARDS

- Travel Granted awarded for NSF SaTC Aspiring PI Workshop 2024, Chicago [May 2024]
- Outstanding Graduate Award (PhD), NMSU Foundation [Fall 2023].