Deeraj Nagothu

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Biographical Sketch

About Me

- Deeraj Nagothu is a Ph.D. candidate in the Electrical and Computer Engineering Department at the Binghamton University - State University of New York (SUNY). He earned his B.Tech. Degree in Electronics and Communication Engineering from SASTRA University, India, in 2015 and an M.S. degree in Electrical and Computer Engineering from Binghamton University in 2016. His current doctoral research focuses on digital media authentication leveraging environmental fingerprints against visual layer attacks.

Research Interests

- Digital Multimedia Authentication, Deep Learning, Information Assurance, Network and Web Security.
- Algorithm Design, and Edge Computing Technologies.
- Artificial General Intelligence Alignment and Safety Research.

Education

2017 – 2023 ◇ **Ph.D, Electrical and Computer Engineering**, Binghamton University-SUNY, Binghamton, NY, USA.
Dissertation title: *Lightweight Multimedia Authentication at the Edge using Environmental Fingerprint*
Advisor: Dr. Yu Chen

2015 – 2016 ◇ **MS, Electrical and Computer Engineering**, Binghamton University-SUNY, Binghamton, NY, USA.
Thesis title: *iCrawl: A high interaction client honeypot system.*
Advisor: Dr. Andrey Dolgikh

2011 – 2015 ◇ **B.Tech, Electronics and Communications Engineering**, SASTRA University, Tamil Nadu, India.

Teaching Experience

Graduate Instructor
- **Network Computer Security (EECE-480F),** Spring 2016 - Spring 2020.

Teaching Assistant
- **Cyber Physical Systems (EECE-480A),** Fall 2016 - Spring 2017.
- **Cryptography and Information Security (EECE-405/560),** Fall 2020.
- **Linear Algebra and Engg Programming (EECE-212),** Spring 2021.

Guest Lecturer
- **Computer Network Architecture (EECE-453/553),** Fall 2018 - 2022.
- **Network Security (EECE-658),** Spring 2018 - 2019.
- **Mathematical Methods in COE (EECE-507),** Fall 2019.
- **Senior Design Project (EECE-486),** Fall 2022.

Skills

Coding	◇ Python, C/C++, C#, Shell, Bash, MATLAB, Powershell, SQL, LaTeX, Neo4j and Cypher.
Network Security	◇ DHCP, SSH, VPN, DNS, Port-Forwarding, DMZ N/W, NMAP scan, Pentesting using Metasploit framework, LibreNMS and Cacti Server for Monitoring.
Virtualization	◇ VMware ESXi, Vcenter, Cisco Nexus, HyperV, Xen, Docker, Proxmox.
Web Dev	◇ HTML, CSS, JavaScript, Flask Web Server, React and Jekyll
Languages	◇ Strong reading, writing and speaking competencies for English, Hindi, Telugu, Tamil.
Misc.	◇ Academic research, teaching, training, consultation.

Research Publications

Journal Articles

1 **Nagothu**, **D.**, Xu, R., Chen, Y., Blasch, E., & Aved, A. (2022a). Defakepro: Decentralized deepfake attacks detection using enf authentication. *IT Professional*, *24*(5), 46–52. doi:10.1109/MITP.2022.3172653

2 **Nagothu**, **D.**, Xu, R., Chen, Y., Blasch, E., & Aved, A. (2022b). Deterring deepfake attacks with an electrical network frequency fingerprints approach. *Future Internet*, *14*(5), 125. doi:10.3390/fi14050125

3 Xu, R., **Nagothu**, **D.**, & Chen, Y. (2021a). Decentralized video input authentication as an edge service for smart cities. *IEEE Consumer Electronics Magazine*, *10*(6), 76–82. doi:10.1109/MCE.2021.3062564

4 Xu, R., **Nagothu**, **D.**, & Chen, Y. (2021b). Econledger: A proof-of-enf consensus based lightweight distributed ledger for iovt networks. *Future Internet*, *13*(10), 248. doi:10.3390/fi13100248

5 **Nagothu**, **D.**, Chen, Y., Aved, A., & Blasch, E. (2021). Authenticating video feeds using electric network frequency estimation at the edge. *EAI Endorsed Transactions on Security and Safety*, *"7"*(24). doi:10.4108/eai.4-2-2021.168648

6 Xu, R., Nikouei, S. Y., **Nagothu**, **D.**, Fitwi, A., & Chen, Y. (2020). Blendsps: A blockchain-enabled decentralized smart public safety system. *Smart Cities*, *3*(3), 928–951. doi:10.3390/smartcities3030047

7 **Nagothu**, **D.**, Chen, Y., Blasch, E., Aved, A., & Zhu, S. (2019). Detecting malicious false frame injection attacks on surveillance systems at the edge using electrical network frequency signals. *Sensors (Basel).*, *19*(11), 1–19. doi:10.3390/s19112424

Conference Proceedings

1 Poredi, N., **Nagothu**, **D.**, Chen, Y., Li, X., Aved, A., Ardiles-Cruz, E., & Blasch, E. (2022). Robustness of electrical network frequency signals as a fingerprint for digital media authentication. In *2022 ieee 24th international workshop on multimedia signal processing (mmsp)* (pp. 1–6). doi:10.1109/MMSP55362.2022.9949315

2 **Nagothu**, **D.**, Dimock, D., Kulesza, A., Yang, H., & Chen, Y. (2022). A distributed crawler for iovt-based public safety surveillance exploring the spatio-temporal correlation. In *Sensors and systems for space applications xv* (Vol. 12121, pp. 18–28). doi:10.1117/12.2618909

3 **Nagothu**, **D.**, Xu, R., Chen, Y., Blasch, E., & Aved, A. (2021a). Detecting compromised edge smart cameras using lightweight environmental fingerprint consensus. In *Proceedings of the 19th acm conference on embedded networked sensor systems* (pp. 505–510). doi:10.1145/3485730.3493684

4 **Nagothu**, **D.**, Xu, R., Chen, Y., Blasch, E., & Aved, A. (2021b). Defake: Decentralized enf-consensus based deepfake detection in video conferencing. In *Ieee 23rd international workshop on multimedia signal processing*. doi:10.1109/MMSP53017.2021.9733503

5 Quan, W., **Nagothu**, **D.**, Poredi, N., & Chen, Y. (2021). Cripi: An efficient critical pixels identification algorithm for fast one-pixel attacks. In *Sensors and systems for space applications xiv* (Vol. 11755, pp. 83–99). doi:10.1117/12.2581377

6 Rosenberg, M., Burns, J. H., **Nagothu**, **D.**, & Chen, Y. (2020). Enabling continuous operations for uavs with an autonomous service network infrastructure. In *Sensors and systems for space applications xiii* (Vol. 11422, pp. 165–179). doi:10.1117/12.2565866

7 Fitwi, A. H., **Nagothu**, **D.**, Chen, Y., & Blasch, E. (2019). A distributed agent-based framework for a constellation of drones in a military operation. In *Proc. - winter simul. conf.* (Vol. 2019-Decem). doi:10.1109/WSC40007.2019.9004907

8 **Nagothu**, **D.**, Schwell, J., Chen, Y., Blasch, E., & Zhu, S. (2019). A study on smart online frame forging attacks against video surveillance system. In *Proc. spie - int. soc. opt. eng.* (Vol. 11017). doi:10.1117/12.2519005

9 **Nagothu**, **D.**, Xu, R., Nikouei, S. Y., & Chen, Y. (2019). A microservice-enabled architecture for smart surveillance using blockchain technology. In *2018 ieee int. smart cities conf. isc2 2018.* doi:10.1109/ISC2.2018.8656968

10 Nikouei, S. Y., Xu, R., **Nagothu**, **D.**, Chen, Y., Aved, A., & Blasch, E. (2019). Real-time index authentication for event-oriented surveillance video query using blockchain. In *2018 ieee int. smart cities conf. isc2 2018.* doi:10.1109/ISC2.2018.8656668

Book Chapters

1 Xu, R., **Nagothu**, **D.**, & Chen, Y. (2023). Ecom: Epoch randomness-based consensus committee configuration for iot blockchains. In K. Daimi, I. Dionysiou, & N. El Madhoun (Eds.), *Principles and practice of blockchains* (pp. 135–154). doi:10.1007/978-3-031-10507-4_7

2 **Nagothu**, **D.**, Poredi, N., & Chen, Y. (2022). Evolution of attacks on intelligent surveillance systems and effective detection techniques. doi:10.5772/intechopen.105958

3 **Nagothu**, **D.**, Xu, R., Nikouei, S. Y., Zhao, X., & Chen, Y. (2020). Smart surveillance for public safety enabled by edge computing. (pp. 409–433). doi:10.1049/PBPC033E_ch19

Books

1 **Nagothu**, **D.**, & Chen, Y. (2023). *Authentication of video feeds in smart edge surveillance networks* (C. Olson, Ed.). Bellingham, Washington 98227-0010: SPIE Press.

Dissertation and Thesis

1 **Nagothu**, **D.** (2016). *Icrawl: A high interaction client honeypot system* (M.S. State University of New York at Binghamton, United States – New York).

Professional Service

Reviewer for Journals

- SPIE Journal of Electronic Imaging (JEI).
- Elsevier Computers and Security

Reviewer for Conferences

- IEEE International Conference on Computer Communications (INFOCOM).
- IEEE Global Communications Conference (GLOBECOM) IoT and Sensor Networks (IoTSN).

Professional Service (continued)

- IEEE Global Communications Conference (GLOBECOM) Communication and Information Systems Security (CISS).
- IEEE Global Communications Conference (GLOBECOM) Communications Software, Services and Multimedia Apps (CSSMA).
- IEEE International Conference on Wireless and Mobile Computing, Networking And Communications (WiMob).
- ACM International Workshop on Blockchain-enabled Networked Sensor Systems (BlockSys)
- IEEE International Smart Cities Conference (ISC2).
- IEEE International Conference on Cloud Networking (CloudNet)
- IEEE International Conference on Communications (ICC)

Miscellaneous Experience

Awards and Achievements

2020 ◇ **GSEA**, Graduate Student Award for Excellence in Teaching.

Academic Mentor

2022-2023 ◇ **ECE Capstone Design Project (ECD 323)**. "Real-Time Visual-Layer Attacks Detection using Electrical Network Frequency Signals".

2019-2020 ◇ **Master's Thesis** "Critical Pixels Attack on DNN"

◇ **Master's Thesis** "Human Identification Using Skeleton Joints Based on 2D Image"

2019-2021 ◇ **ECE Capstone Design Project (ECD 122 - WCP 29)**. "Exploring the Spatio-Temporal Correlation in IoVT Network for Smart Public Safety".

2018-2019 ◇ **ECE Capstone Design Project (WCP40)**. "Service Network for Drones".

Memberships

◇ **IEEE**.

◇ **ACM**.