

Nirnimesh Ghose Assistant Professor

CONTACT INFORMATION

Department: School of Computing
University: University of Nebraska–Lincoln
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RESEARCH INTERESTS

Network security and privacy with applications to emerging wireless networks, cyber-physical systems, Internet-of-things, aviation and transportation networks, bio-social inspired dynamic spectrum access and the interaction between cybersecurity and social networks.

EDUCATION

- **The University of Arizona, Tucson, Arizona**
 - Ph.D. in Electrical and Computing Engineering, May 2019
 - Dissertation Title: *“Authentication and Message Integrity Verification without secrets”*
 - Advisor: Dr. Loukas Lazos
 - GPA: 4.00/4.00
- **Illinois Institute of Technology, Chicago, Illinois**
 - Master of Science in Electrical and Computing Engineering, May 2012
 - Thesis Title: *“Congestion control and packet reordering for multipath transmission control protocol”*
 - Advisor: Dr. Tricha Anjali
 - GPA: 3.52/4.00
- **Uttar Pradesh Technical University (UPTU), Lucknow, U.P., India**
 - Bachelor of Technology in Electronics and Communication Engineering, June 2010
 - Undergrad Project: *“Cell phone controlled home appliances using microcontroller AT89S8253”*
 - GPA: 74.5/100

ACADEMIC EXPERIENCE

- **University of Nebraska - Lincoln, Nebraska** August 2019 - Present
Assistant Professor
- **The University of Arizona, Tucson, Arizona** May 2019 - July 2019
Research Specialist, Principal, Advisor: Dr. Loukas Lazos
- **The University of Arizona, Tucson, Arizona** January 2014 - May 2019
Research Assistant, Advisor: Dr. Loukas Lazos
- **Illinois Institute of Technology, Chicago, Illinois** January 2011 - May 2012
Research Assistant, Advisor: Dr. Tricha Anjali
- **Illinois Institute of Technology, Chicago, Illinois** June 2011 - November 2011
Research Assistant, Advisor: Dr. Kenneth Zdunek
- **Indian Institute of Technology, BHU, Varanasi, U.P. India** May 2009 - August 2009
Undergrad Research Assistant, Advisor: Dr. P. Chakravarty

INDUSTRY EXPERIENCE

- **Fidelity, Covington, Kentucky** August 2012 - December 2013

Application Developer

PUBLICATIONS

Manuscripts under Review

1. **Ghose, Nirnimesh;** Gupta, Kaustubh; Lazos, Loukas; Li, Ming; Xu, Ziqi; Li, Jingcheng, “ZITA: Zero-Interaction Two-Factor Authentication using Contact Traces and In-band Proximity Verification,” *Under review at IEEE Transactions on Mobile Computing*, 2022.

Journal Papers

1. **Ghose, Nirnimesh;** Hu, Bocan; Zhang Yan; Lazos, Loukas, “Secure Physical Layer Voting,” *IEEE Transactions on Mobile Computing*, Vol. 17, No. 3, pp. 688 - 702, March 2018.
2. **Ghose, Nirnimesh;** Lazos, Loukas; Li, Ming; “In-band Secret-Free Pairing Protocol for COTS Wireless Devices,” *IEEE Transactions on Mobile Computing (TMC)*, Vol. 21, No. 2, pp. 612 - 628, February 2022.

Peer-Reviewed Conference Papers

1. **Ghose, Nirnimesh;** Lazos, Loukas, “Verifying ADS-B navigation information through Doppler shift measurements,” in *Proc. of 34th IEEE/AIAA Digital Avionics Systems Conference (DASC)*, pp.4A2-1 - 4A2-11, 13-17 Sept. 2015. (**2nd Best Graduate Student Paper**).
2. **Ghose, Nirnimesh;** Lazos, Loukas; Li, Ming, “HELP: Helper-Enabled In-Band Device Pairing Resistant Against Signal Cancellation,” in *Proc. of 26th USENIX Security Symposium (USENIX Security’17)*, Vancouver, BC, Canada, pp. 433 - 450, 16-18 Aug. 2017. (Acceptance rate: **16.1%**).
3. **Ghose, Nirnimesh;** Lazos, Loukas; Li, Ming, “SFIRE: Secret-Free In-band Trust Establishment for COTS Wireless Devices,” in *Proc. of 37th IEEE International Conference on Computer Communication (IEEE INFOCOM 2018)*, Honolulu, HI, pp. 1529 - 1537, 15-19 Apr. 2018. (Acceptance rate: **19.2%**).
4. **Ghose, Nirnimesh;** Lazos, Loukas; Li, Ming, “Secure Device Bootstrapping without Secrets Resistant to Signal Manipulation Attacks,” in *Proc. of 39th IEEE Symposium on Security & Privacy (Oakland) 2018 (S&P 2018)*, San Francisco, CA, pp. 819 - 835, 21-23 May, 2018. (Acceptance rate: **11.48%**).
5. **Ghose, Nirnimesh;** Lazos, Loukas; Rozenblit, Jerzy; Breiger, Ronald; “Multimodal Graph Analysis of Cyber Attacks,” in *Proc. of 2019 Spring Simulation Conference (SpringSim19)*, Tucson, AZ, 29 April - 2 May, 2019.
6. Li, Haipeng; Wang, Chenggang; **Ghose, Nirnimesh;** Wang, Boyang, “Robust Deep-learning-based Radio Fingerprinting with Fine-Tuning,” in *Proc. of 14th ACM Conference on Security and Privacy in Wireless and Mobile Networks (ACM WiSec 2021)*, Virtual Event, June 28 to July 2, 2021.
7. Wisniewska, Anna; **Ghose, Nirnimesh;** Khan, Bilal, “Evaluation of a Bio-Socially Inspired Secure DSA Scheme Using Testbed-Calibrated Hybrid Simulations,” in *Proc. of IEEE Information Technology, Electronics and Mobile Communication Conference, Virtual Event*, October 27 to 30, 2021.
8. Xu, Ziqi; Li, Jingcheng; Pan, Yanjun; Lazos, Loukas; Li, Ming; **Ghose, Nirnimesh,** “PoF: Proof-of-Following for Vehicle Platoons.” in *Proc. of Network and Distributed System Security Symposium (NDSS 2022)*, San Diego, CA (Hybrid Event), April 24 to 28, 2022.
9. Oguchi, Ebuka; **Ghose, Nirnimesh;** Can Vuran, Mehmet, “STUN: Secret-Free Trust- Establishment For Underground Wireless Networks,” *Proc. of IEEE INFOCOM Wkshp Wireless-Sec: 5G & Beyond Wireless Security, Virtual Event*, May 02 to May 05, 2022.
10. Li, Haipeng; Gupta, Kaustubh; Wang, Chenggang; **Ghose, Nirnimesh;** Wang, Boyang, “RadioNet: Robust Deep-Learning Based Radio Fingerprinting,” in *Proc. of IEEE Conference on Communications and Network Security (IEEE CNS)*, Austin, TX, Oct 03 to Oct 05, 2022.

11. Gupta, Kaustubh; **Ghose, Nirnimesh**; Wang, Boyang, “RADTEC: Re-authentication of IoT Devices with Machine Learning,” *Proc. of IEEE Consumer Communications & Networking Conference (CCNC)*, Jan 08 to 12 2023.

Thesis

1. **Ghose, Nirnimesh**, “Congestion control and packet reordering for multipath transmission control protocol,” MS thes., Illinois Institute of Technology, 2012.
2. **Ghose, Nirnimesh**, “Authentication and Message Integrity Verification without Secrets,” Diss. The University of Arizona, 2019.

FUNDED GRANTS

Internal Grants

◇ Machine Learning, Data Mining and Wireless PHY-layer for a secure IoT System from NU system as Co-PI duration 07/2021–06/2022 for \$7,100.00.

TEACHING:

COURSES TAUGHT

Fall 2019

CSCE 496/896 Special Topics: Mobile and Wireless Security (Enrollment: Undergraduate: 6, Graduate: 0).

Spring 2020

CSCE 465/865 Wireless Communication Networks (Enrollment: Undergraduate: 11, Graduate: 3).

Fall 2020

CSCE 477/877 Cryptography & Security (Enrollment: Undergraduate: 17, Graduate: 0).

Spring 2021

CSCE 465/865 Wireless Communication Networks (Enrollment: Undergraduate: 13, Graduate: 1).

Fall 2021

CSCE 477/877 Cryptography & Security (Enrollment: Undergraduate: 21, Graduate: 3).

Spring 2022

CSCE 465/865 Wireless Communication Networks (Enrollment: Undergraduate: 7, Graduate: 13).

Fall 2022

CSCE 477/877 Cryptography & Security (Enrollment: Undergraduate: 21, Graduate: 3).

HONORS AND AWARDS

- ◇ Best-in-Session Presentation Award at 12th IEEE IEMCON, 2021
- ◇ Travel grant for 39th IEEE Security and Privacy Symposium (funded by IEEE), 2018
- ◇ Best-in-Session Presentation Award at 37th IEEE INFOCOM, 2018
- ◇ Travel grant award for 37th IEEE INFOCOM (funded by IEEE ComSoc), 2018
- ◇ Travel grant award for 26th USENIX Security Symposium (funded by Google), 2017
- ◇ 2nd Best Graduate Student Paper at 34th Digital Avionics Systems Conference, 2015
- ◇ Travel grant award for 34th DASC (funded by GPSC, University of Arizona), 2015
- ◇ Byron Innovation Project Award for developing Wireless sensor Network prototype, 2011
- ◇ Prestigious KVPY (Young Scientist) Fellowship of DST Govt. of India, 2003

PROFESSIONAL SERVICES AND ACTIVITIES

Conference Organizing Committee

IEEE CNS 2018 (Web Chair).

Journal Reviewers (direct reviews only)

- ◇ IET Wireless Sensor Systems (2 reviews 2021).

- ◇ IEEE Transactions on Dependable and Secure Computing (TDSC) (1 review in 2022, 1 review in 2021, 2 reviews in 2020 and 1 review in 2019).
- ◇ IEEE Transactions on Mobile Computing (TMC) (2 reviews in 2022, 1 review in 2021, 1 review in 2020, 1 review in 2018).
- ◇ IEEE/ACM Transactions on Networking (TNET) (2 reviews in 2020 and 1 review in 2015).
- ◇ IEEE Transactions on Network Science and Engineering (TNSE) (1 review in 2020).
- ◇ IEEE Transactions on Vehicular Technology (TVT) (1 review in 2019).
- ◇ IEEE Transactions on Wireless Communications (TWC) (1 review in 2019).
- ◇ IEEE Transactions on Knowledge and Data Engineering (TKDE) (1 review in 2019).
- ◇ IEEE Transactions on Industrial Informatics (TII) (1 review in 2019).
- ◇ Future Generation Computer Systems (Elsevier) (1 review in 2018).
- ◇ Digital Signal Processing (Elsevier) (1 review in 2018).

Conference Reviewers (direct reviews and sub-reviews)

IEEE CCNC 2023, 2022, 2021, 2020; IEEE CNS 2022, 2020, 2018; IEEE INFOCOM 2019; ESORICS 2018; ACM WiSec 2018, IEEE WCNC 2016.

Panel Reviewers

NSF SaTC Summer 2021.

TECHNOLOGY
SKILLS

USRP National Instruments USRP 2921, Ettus USRP 2, LabView.

Network Simulation tools Network Simulator-2 and Network Simulator-3.

Technology CAD Device level and process level simulation tools - ATLAS (Device), ATHENA.

Mathematical Modeling Tools Mathworks MATLAB.

Computer Programming Java, Spring, Hibernate, C, C++, OTcl.