Zizheng Liu

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Education

Purdue University	West Lafayette, IN, USA
Ph.D. in Computer Science, Advisor: Chunyi Peng	Aug 2021 - Present
Columbia University in the City of New York	New York, NY, USA
M.S. in Computer Science, GPA: 3.76/4	Aug 2018 - Dec 2019
Northeastern University	Shenyang, China
B.E. in Computer Science and Technology, GPA: 3.84/5 (88.4/100)	Sep 2014 - Jun 2018
University of Illinois at Chicago	Chicago, IL, USA
Exchange student in the Department of Electrical & Computer Engineering	Aug 2017 - May 2018

Research Experience

Purdue MSSN Lab, Advisor: Prof. Chunyi Peng

Breaking Geographic Routing Among Connected Vehicles   Sep 2022 - Apr 2023

- Introduced novel DoS attacks against vehicular communication by exploiting vulnerabilities discovered in the routing algorithms from ETSI connected vehicle standards. [PDF]

Security Analysis for Emerging Cellular Network Technologies   Dec 2021 - Sep 2022

- Used NLP techniques to automatically discover potential vulnerability indications from 3GPP technical specifications for emerging cellular network technologies such as C-V2X and CIoT. [PDF]

Columbia IRT Lab, Advisor: Prof. Henning Schulzrinne

Pitfalls of MUD File Generation and Design Flaws of Smart Home IoT Devices   May 2019 - Feb 2020

- Found design flaws of smart home IoT devices and issues in manufacturer usage description (MUD [RFC 8520]) file generation based on network traffic analysis. [PDF]

Crowd-sourced Generation of MUD Files for Home IoT Devices   Jan 2019 - May 2019

- Designed a frame on home Wi-Fi router that implements firewall for IoT devices according to MUD files retrieved in a crowd-sourcing manner. [Demo]

Publications

Liu, Zizheng, Shaan Shekhar, and Chunyi Peng. "Breaking Geographic Routing Among Connected Vehicles." in IEEE DSN 2023

Zhang, Zhehui, Yanbing Liu, Qianru Li, **Zizheng Liu**, Chunyi Peng, and Songwu Lu. "Dependent Misconfigurations in 5G/4.5 G Radio Resource Control." in ACM CoNext 2023

Liu, Zizheng, and Chunyi Peng. "Poster: Security Analysis for Emerging Cellular Network Technologies." in NSF AI Institute for Future Edge Networks and Distributed Intelligence Annual Meeting 2022

Liu, Zizheng, and Chunyi Peng. "Quality Measurement over Quality Data Reuse in Cellular Networks." in 2nd NSF Workshop on Overcoming Measurement Barriers to Internet Research 2021

Honors and Awards

- IEEE DSN 2023 Student Travel Grant
- Best Category Award (Signal Processing Engineering) in UIC Engineering EXPO 2018
- Outstanding Undergraduate International Exchange Scholarship by China Scholarship Council (2017)
- National Scholarship by Ministry of Education of China (2015, 2017)
- NEU First/Second Prize Scholarship (2015, 2016, 2017)

Services and Activities

- Reviewer: IEEE-Transactions on Information Forensics and Security, Computer Networks, Computer Communications
- Teaching assistant: CS536 Data Communication and Computer Networks (Purdue University, Spring 2023), COMS 4701 Artificial Intelligence (Columbia University, Fall 2019)

Skills

- Programming languages: Python, C/C++, Java, MATLAB, R
- Software: srsRAN, Open5GS, nuXmv, PyTorch
- Hardware: USRP, Arduino, Raspberry Pi, sysmocom