

Curriculum Vitae: Yao Liu

Mailing Address:

Computer Science and Engineering,
ENB 118, University of South Florida,
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EDUCATION

Ph.D., Computer Science Aug. 2007 - May 2012
North Carolina State University, Raleigh NC

M.Eng., Communication and Information System Aug. 2004 - Jun. 2007
Xidian University, Xi'an, China

B.Eng., Computer Science Aug. 2000 - Jun. 2004
Xidian University, Xi'an, China

WORK EXPERIENCE

Associate Professor Aug. 2018 - Present
Department of Computer Science and Engineering, University of South Florida

Assistant Professor Aug. 2012 - Aug. 2018
Department of Computer Science and Engineering, University of South Florida

Research Assistant Aug. 2008 - May 2012
North Carolina State University, Raleigh NC

Teaching Assistant Aug. 2007 - May 2008
North Carolina State University, Raleigh NC

HONORS AND AWARDS

- University of South Florida Outstanding Faculty Achievement Award, 2017.
- USENIX Security'17 Grant for Women by Google, 2017.
- University of South Florida Outstanding Faculty Award, 2017.
- College of Engineering Outstanding Junior Research Achievement Award, 2016.
- National Science Foundation Faculty Early Career Development (CAREER) award, 2016.
- Faculty Research Fellow of Air Force Research Lab, 2015.
- Best Paper Award, IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), 2010.
- Travel award from IEEE Symposium on Security and Privacy (IEEE S&P), 2011.
- Travel award from ACM Conference on Computer and Communications Security (ACM CCS), 2009.
- Student Fellowship, cyber security summer school program by the Information Trust Institute UIUC, 2008.

FUNDING SUPPORT

Funding Summary:

- Total Project Funds: \$1,547,599. Personal Share/Credit: \$1,284,030.

Awarded Funds:

- F8 Army Research Office: "Towards Wireless Physical Layer Security Leveraging Massive and Distributed MIMO Radios".
- Role: PI. Duration: 4/2017 - 4/2019.
 - Total Amount: \$200,000. Personal Share: \$200,000 (100%).
- F7 Army Research Office: "Workshop on Foundations and Challenges for Proactive and Dynamic Network Defense".
- Role: PI. Duration: 6/2017 - 11/2018.
 - Total Amount: \$25,000. Personal Share: \$25,000 (100%).

- F6 CBT Holding: “Analysis of Cryptographic Primitives and Protocols”.
 • Role: Co-PI. Duration: 5/2016 - 5/2017.
 • Total Amount: \$56,649. Personal Share: \$3,080 (5.4%).
- F5 National Science Foundation (NSF): “CAREER: A Pathway towards Channel Camouflage and Manipulation Techniques for Wireless Security”.
 • Role: PI. Duration: 3/2016 - 2/2021.
 • Total Amount: \$499,950. Personal Share: \$499,950 (100%).
- F4 National Science Foundation (NSF): “TWC: Small: Techniques and Tools for Enforcing Proximity-based Policies in Wireless Systems”.
 • Role: PI. Duration: 9/2015 - 9/2018.
 • Total Amount: \$300,000. Personal Share: \$150,000 (50%).
- F3 Army Research Office (ARO): “Broadcast and High-power Reactive Jamming Resilient Wireless Communications”.
 • Role: PI. Duration: 8/2014 - 8/2017.
 • Total Amount: \$340,000. Personal Share: \$340,000 (100%).
- F2 Florida Center for Cybersecurity: “Smart Grid Security Protection through Cross-Layer Approaches”.
 • Role: Co-PI. Duration: 2/2015 - 2/2017.
 • Total Amount: \$100,000. Personal Share: \$40,000 (40%).
- F1 Air Force Research Lab (AFRL): “Power Grid Topology Inference with a Basis for False Data Injection Attacks”.
 • Role: PI. Duration: 5/2015 - 11/2015.
 • Total Amount: \$26,000. Personal Share: \$26,000 (100%).

PUBLICATIONS

Journals:

- J14 Dakun Shen*, Ian Markwood*, Dan Shen, and Yao Liu, “Virtual Safe: Unauthorized Walking Behavior Detection for Mobile Devices”, **IEEE Trans. Mobile Computing**, to appear.
- J13 Chao Shen, Yufei Chen, Yao Liu, and Xiaohong Guan, “Adaptive Human-Machine Interactive Behavior Analysis with Wrist-Worn Devices for Password Inference”, **IEEE Trans. Neural Networks and Learning Systems**, to appear.
- J12 Zi Li*, Qingqi Pei, Ian Markwood*, Yao Liu, Miao Pan, and Hongning Li, “Location Privacy Violation via GPSagnostic Smart Phone Car Tracking”, **IEEE Trans. Vehicular Technology**, to appear.
- J11 Zi Li*, Qingqi Pei, Ian Markwood*, Yao Liu, and Haojin Zhu, “Secret Key Establishment via RSS Trajectory Matching”, **IEEE Trans. Information Forensics and Security**, vol. 13, no. 3, Mar. 2018.
- J10 Fan Jiang, Yao Liu, Benchao Wang, and Xianchao Wang, “A Relay-aided Device-to-Device Based Load Balancing Scheme for Multi-tier Heterogeneous Networks”, **IEEE Internet of Things Journal**, vol. 4, no. 5, pp. 1537-1551, Oct. 2017.
- J9 Song Fang*, Yao Liu, Wenbo Shen, Haojin Zhu, and Tao Wang*, “Virtual Multipath Attack and Defense for Location Distinction in Wireless Networks”, **IEEE Trans. Mobile Computing**, 2016.
- J8 Song Fang*, Yao Liu, and Peng Ning, “Mimicry Attacks against Wireless Link Signature and New Defense using Time-Synched Link Signature”, **IEEE Trans. Information Forensics and Security**, 2016.
- J7 Haojin Zhu, Chenglianhui Fang, Yao Liu, Cailian Chen, Mengyuan Li, and Xuemin Shen, “You Can Jam But You Can’t Hide: Defending Against Jamming Attacks for Geo-location Database Driven Spectrum Sharing”, **IEEE Journal on Selected Areas in Communications**, 2016.
- J6 Tao Wang*, Yao Liu, Tao Hou, Qingqi Pei, and Song Fang*, “Signal Entanglement based Pinpoint Waveforming for Location-restricted Service Access Control”, **IEEE Trans. Dependable and Secure Computing**, 2016.

- J5 Fan Jiang, Ben-chao Wang, Chang-yin Sun, Yao Liu, and Xianchao Wang, "Resource Allocation and Dynamic Power Control for D2D Communication Underlying Uplink Multi-cell Networks", **Wireless Networks**, 2016.
- J4 Song Fang*, Yao Liu, and Peng Ning, "Wireless Communications under Broadband Reactive Jamming Attacks", **IEEE Trans. Dependable and Secure Computing**, 2015.
- J3 Tao Wang*, Yao Liu, and Athanasios V. Vasilakos, "Survey on channel reciprocity based key establishment techniques for wireless systems", **Wireless Networks**, pp. 1 - 12, Jan. 2015.
- J2 Kebina Manandhar, Xiaojun Cao, Fei Hu, and Yao Liu, "Detection of Faults and Attacks Including False Data Injection Attack in Smart Grid Using Kalman Filter", **IEEE Trans. Control of Network Systems**, vol. 1, no. 4, pp. 370 - 379, Dec. 2014.
- J1 Yao Liu, Peng Ning, and Michael Reiter, "Generalized False Data Injection Attacks against State Estimation in Electric Power Grids", **ACM Trans. Information and System Security**, vol. 14, no. 1, May. 2011.

Conferences:

- C33 Song Fang*, Ian Markwood*, Yao Liu, Shangqing Zhao, Zhuo Lu, and Haojin Zhu, "No Training Hurdles: Fast Training-Agnostic Attacks to Infer Your Typing", in *Proc. of ACM Conference on Computer and Communications Security (CCS)*, Oct. 2018 (Acceptance Rate: 16.6%).
- C32 Yan Meng, Zichang Wang, Wei Zhang, Peilin Wu, Haojin Zhu, Xiaohui Liang, and Yao Liu, "WiVo: Enhancing the Security of Voice Control System via Wireless Signal in IoT Environment", in *Proc. of ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, June 2018 (Acceptance Rate: 16.9%).
- C31 Xiaoshan Wang*, Yao Liu, Xiang Lu, Shichao Lv, Zhiqiang Shi and Limin Sun, "On Eavesdropping Attacks and Countermeasures for MU-MIMO Systems", in *Proc. of IEEE Military Communications Conference (MILCOM)*, Oct. 2017.
- C30 Song Fang*, Ian Markwood* and Yao Liu, "Manipulatable Wireless Key Establishment", in *Proc. of IEEE Conference on Communications and Network Security (CNS)*, Oct. 2017 (Acceptance Rate: 29.9%).
- C29 Shangqing Zhao, Zhengping Luo, Zhuo Lu, Xiang Lu, and Yao Liu, "Stateful Inter-Packet Signal Processing for Wireless Networking", in *Proc. of ACM Conference on Mobile Computing and Networking (MobiCom)*, Oct. 2017 (Acceptance Rate: 18.83%).
- C28 Ian Markwood*, Dakun Shen*, Yao Liu, and Zhuo Lu, "PDF Mirage: Content Masking Attack Against Information-Based Online Services", in *Proc. of USENIX Security Symposium (USENIX Security)*, Aug. 2017 (Acceptance Rate: 16.28%) (The first two authors are co-first authors in alphabetical order).
- C27 Ian Markwood*, Yao Liu, Kevin Kwiat, and Charles A Kamhoua, "Electric Grid Power Flow Model Camouflage Against Topology Leaking Attacks", in *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, May 2017 (Acceptance Rate: 20.93%).
- C26 Mengyuan Li, Yan Meng, Junyi Liu, Haojin Zhu, Xiaohui Liang, Yao Liu, and Na Ruan , "When CSI Meets Public WiFi: Inferring Your Mobile Phone Password via WiFi Signals", in *Proc. of ACM Conference on Computer and Communications Security (CCS)*, Oct. 2016 (Acceptance Rate: 16.49%).
- C25 Dakun Shen*, Ian Markwood*, Dan Shen, and Yao Liu, "Virtual Safe: Unauthorized Movement Detection for Mobile Devices", in *Proc. of IEEE Conference on Communications and Network Security (CNS)*, Sept. 2016 (Acceptance Rate: 29%).
- C24 Ian Markwood*, and Yao Liu, "Vehicle Self-Surveillance: Sensor-Enabled Automatic Driver Recognition", in *Proc. of ACM Asia Conference on Computer and Communications Security (AsiaCCS)*, May 2016 (Acceptance Rate: 19%).
- C23 Ahamed Alagil*, Meshari Alotaibi, and Yao Liu, "Randomized Positioning DSSS for Anti-Jamming Wireless Communications", in *Proc. of International Conference on Computing, Networking and Communications (ICNC)*, Feb 2016.

- C22 Tao Wang*, Yao Liu, Qingqi Pei, and Tao Hou, "Location-restricted Services Access Control Leveraging Pinpoint Waveforming", in *Proc. of ACM Conference on Computer and Communications Security (CCS)*, Oct. 2015 (Acceptance Rate: 19.8%).
- C21 Xiaoshan Wang*, Yao Liu, Zhiqiang Shi, Xiang Lu, and Limin Sun, "A Privacy-Preserving Fuzzy Localization Scheme with CSI Fingerprint", in *Proc. of IEEE Global Communications Conference (GLOBECOM)*, Dec. 2015.
- C20 Hongning Li, Qingqi Pei, and Yao Liu, "Agent-based Channel Selection Scheme against Location Inference Attack in Cognitive Radio Networks", in *Proc. of IEEE Military Communications Conference (MILCOM)*, Oct. 2015.
- C19 Wenbo Shen, Yao Liu, Xiaofan He, Huaiyu Dai, and Peng Ning, "No Time to Demodulate - Fast Physical Layer Verification of Friendly Jamming", in *Proc. of IEEE Military Communications Conference (MILCOM)*, Oct. 2015.
- C18 Tao Wang* and Yao Liu, "Secure Distance Indicator Leveraging Wireless Link Signatures", in *Proc. of IEEE Military Communications Conference (MILCOM)*, Oct. 2014.
- C17 Wenbo Shen, Peng Ning, Xiaofan He, Huaiyu Dai and Yao Liu, "MCR Decoding: A MIMO Approach for Defending Against Wireless Jamming Attacks", in *Proc. of IEEE Conference on Communications and Network Security: Workshop on Physical-layer Methods for Wireless Security (CNS)*, Sep. 2014.
- C16 Song Fang*, Yao Liu, Wenbo Shen, and Haojin Zhu, "Where Are You From? Confusing Location Distinction Using Virtual Multipath Camouflage", in *Proc. of ACM Annual International Conference on Mobile Computing and Networking (MobiCom)*, Sep. 2014 (Acceptance Rate: 16.36%).
- C15 Tao Wang*, Yao Liu, and Jay Ligatti, "Fingerprinting Far Proximity From Radio Emissions", in *Proc. of European Symposium on Research in Computer Security (ESORICS)*, Sep. 2014 (Acceptance Rate: 24.79%).
- C14 Kebina Manandhar, Xiaojun Cao, Fei Hu, and Yao Liu, "Combating False Data Injection Attacks in Smart Grid Using Kalman Filter", in *Proc. of IEEE International Conference on Computing, Networking and Communications (ICNC)*, Feb. 2014.
- C13 Zhaoyu Gao, Haojin Zhu, Yao Liu, Muyuan Li and Zhenfu Cao, "Location Privacy in Database-driven Cognitive Radio Networks: Attacks and Countermeasures", in *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, Apr. 2013 (Acceptance Rate: 17.36%).
- C12 Zhaoyu Gao, Haojin Zhu, Yao Liu, Muyuan Li and Zhenfu Cao, "Location Privacy Leaking from Spectrum Utilization Information in Database-driven Cognitive Radio Network", in *Proc. of ACM Conference on Computer and Communications Security, Poster Session (CCS)*, Oct. 2012.
- C11 Yao Liu and Peng Ning, "BitTrickle: Defending against Broadband and High-power Reactive Jamming Attacks", in *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, Apr. 2012 (Acceptance Rate: 17.97%).
- C10 Arun Natarajan, Peng Ning, Yao Liu, Sushil Jajodia, and Steve E. Hutchinson, "NSDMine: Automated Discovery of Network Service Dependencies", in *Proc. of IEEE Conference on Computer Communications (INFOCOM)*, Apr. 2012 (Acceptance Rate: 17.97%).
- C9 Yao Liu and Peng Ning, "Enhanced Wireless Channel Authentication Using Time-Synched Link Signature", in *Proc. of IEEE Conference on Computer Communications, mini-conference (INFOCOM)*, Apr. 2012.
- C8 Yao Liu and Peng Ning, "Mimicry Attacks against Wireless Link Signature", in *Proc. of ACM Conference on Computer and Communications Security, Poster Session (CCS)*, Oct. 2011.
- C7 An Liu, Peng Ning, Huaiyu Dai, Yao Liu, and Cliff Wang, "Defending DSSS-based Broadcast Communication against Insider Jammers via Delayed Seed-Disclosure", in *Proc. of Annual Computer Security Applications Conference (ACSAC)*, Dec. 2010 (Acceptance Rate: 19%).
- C6 An Liu, Peng Ning, Huaiyu Dai, and Yao Liu, "USD-FH: Jamming-resistant Wireless Communication using Frequency Hopping with Uncoordinated Seed Disclosure", in *Proc. of IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS)*, Nov. 2010.

- C5 Yao Liu, Peng Ning, and Huaiyu Dai, "Authenticating Primary Users' Signals in Cognitive Radio Networks via Integrated Cryptographic and Wireless Link Signatures", in *Proc. of IEEE Symposium on Security and Privacy (Oakland)*, May 2010 (Acceptance Rate: 11.61%).
- C4 Yao Liu, Peng Ning, Huaiyu Dai, and An Liu, "Randomized Differential DSSS: Jamming-Resistant Wireless Broadcast Communication", in *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, Mar. 2010 (Acceptance Rate: 17.52%).
- C3 Yao Liu, Peng Ning, and Michael K. Reiter, "False Data Injection Attacks against State Estimation in Electric Power Grids", in *Proc. of ACM Conference on Computer and Communications Security (CCS)*, Nov. 2009 (Acceptance Rate: 18.74%).
- C2 Young-Hyun Oh, Peng Ning, Yao Liu, and Michael Reiter, "Authenticated Data Compression in Delay Tolerant Wireless Sensor Networks", in *Proc. of International Conference on Networked Sensing Systems (INSS)*, Jun. 2009.
- C1 Zhuo Lu, Jiandong Li, Linjing Zhao, and Yao Liu, "Composite Frequency-offset Estimator for Wireless Communications", in *Proc. of IEEE International Conference on Communications (ICC)*, Jun. 2007.

TALKS AND PANELS

- 04/2016 Attendee, NSF/DHS US-Brazil Workshop on Cyber Security and Privacy, Orlando, FL.
- 10/2015 Invited Academic Talk, University of Arkansas, Little Rock, AR.
- 10/2015 Presenter, IEEE Military Communication Conference (MILCOM) in Tampa FL.
- 04/2015 Invited Academic Talk, Xidian University, Xi'an, China.
- 03/2015 Attendee, NSF workshop in wireless security, Arlington, VA.
- 05/2014 Invited Academic Talk, Chinese Academy of Sciences, Beijing, China.
- 05/2014 Invited Academic Talk, Xidian University, Xi'an, China.
- 05/2014 Invited Academic Talk, Shanghai Jiao Tong University, Shanghai, China.
- 03/2012 Presenter, IEEE Conference on Computer Communications (INFOCOM), Orlando, FL.
- 11/2010 Presenter, IEEE IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), San Francisco, CA.
- 03/2012 Presenter, IEEE Conference on Computer Communications (INFOCOM), San Diego, CA.
- 05/2010 Presenter, IEEE Symposium on Security and Privacy (Oakland), Oakland, FL.
- 10/2009 Presenter, ACM Conference on Computer and Communications Security (CCS), Chicago, IL.

TEACHING EXPERIENCE

- Courses at University of South Florida include:
 - CNT 4411/CIS6930 Computing and Network Security
 - COT 6405 Introduction to Algorithm
 - CIS 6930 Emerging Topics in Network Security

STUDENT ADVISING AND UNIVERSITY SERVICES

- University of South Florida:
 - Ph.D. Advisees: Song Fang (2013 to present), Tao Wang (2013 to present), Ian Markwood (2013 to present), Dakun Shen (2015 to present), Ahmad Alagil (2014 to present), Adel Alshehri (2014 to present)
 - M.S. Advisees: Hari Krishna Jonnalagadda (Defense Summer 2016), Nagalaxmi Yenuganti (Defense Summer 2016).
 - Ph.D. Thesis Committee: Donald Ray, Xiang Zuo, Esad Ankarali (Defended in 2015), Ertugrul Guvenkaya (Defended in 2015), Md Imrul Kayes (Defended in 2015)
 - M.S. Thesis Committee: Cory Juhlin (Defended in 2015), Ryan Wheeler (Defended in 2015), Hernan Palombo (Defended in 2015), Jean-Baptiste Subils (Defended in 2015), Cagri Cetin (Defended in 2015), Grant Smith (Defended in 2014), Donald Ray (Defended in 2013)
 - Department Infrastructure Committee: 2015-2016.
 - Faculty Search Committee for Florida Cybersecurity Center: 2015.

PROFESSIONAL SERVICES

• **Organization and Chairing:**

- Student Travel Chair, IEEE Symposium on Security and Privacy (Oakland) 2019
- Guest Editor, International journal of security and networks (IJSN) 2014 - present
- Guest Editor, IEEE Multimedia Magazine 2016 - 2017
- Publicity Co-Chair, International Conference on Big Data Computing and Communications (BigCom) 2016
- Session Chair, ACM Conference on Computer and Communications Security (CCS) 2015
- Session Chair, IEEE Conference on Computer Communications (INFOCOM) 2015

• **Technical Program Committee:**

- ACM Conference on Computer and Communications Security (CCS) 2015 - 2017
- ACM International Conference on Future Energy Systems (ACM e-Energy) 2016
- IEEE Conference on Communications and Network Security (CNS) 2016 - 2017
- IEEE Conference on Computer Communications (INFOCOM) 2015 - 2019
- IEEE International Conference on Communications (ICC) 2015 - 2017
- IEEE International Conference on Computer Communications and Networks (ICCCN) 2015
- International Conference on Computing, Networking and Communications (ICNC) 2015
- International Performance Computing and Communications Conference (IPCCC) 2016 - 2017
- The Military and Commercial Communications Conference (MILCOM) 2014
- International Workshop on Security in Cloud Computing (ASIACCS-SCC) 2013 - 2014
- Network and Distributed Systems Security (NDSS) 2013
- IEEE Consumer Communications and Networking Conference (CCNC) 2013

• **Academic Paper Reviewer:**

- IEEE Communication Letters
- IEEE J. Selected Areas in Communications
- IEEE Trans. Information Forensics and Security
- IEEE Trans. Dependable and Secure Computing
- IEEE Trans. Mobile Computing
- IEEE Trans. Parallel and Distributed Systems
- IEEE Trans. Smart Grid
- IEEE Trans. Systems, Man and Cybernetics
- IEEE Trans. Vehicular Technology
- IEEE Trans. Wireless Communications
- International J. Communications Systems
- Wireless Communications and Mobile Computing
- Wireless Networks

• **Academic Proposal Reviewer/Panelist:**

- Army Research Office, Computing Sciences, 2014, 2016
- National Science Foundation, Computer Information Science & Engineering, 2015–2017