Sheng Liu

Contact Information

- Mailing Address: Room #2-200, SEIEE Building, Shanghai Jiao Tong University, No.800 Dongchuan Road, Shanghai 200240, P.R. China
- Email Address: liusheng198933@gmail.com; liusheng@sjtu.edu.cn
- Mobile Phone: 86-13916591142
- Homepage: http://nsec.sjtu.edu.cn/~sliu/

Research Interest

- Security & Privacy in Wireless Networks
- Cognitive Radio Network
- Security in Social Network
- Smart Phone System Security

Education

- **Shanghai Jiao Tong University(SJTU)** Shanghai, China

  M.S. Control Science and Engineering Sept. 2011 – Mar. 2014 (expected)

  - Advisor: Prof. Xinping Guan and Prof. Haojin Zhu
  - GPA: 2.6/3.3
  - Rank: top 15%

- **Huazhong University of Science & Technology(HUST)** Hubei, China

  B.E. Control Science and Engineering Sept. 2007 – Jun. 2011

  - GPA: 86.028/100
  - Rank: top 10%
  - Thesis Topic: The Prototype Design of Smart Helmet: the Monitoring Center

Publications

- **Sheng Liu** , Haojin Zhu, Rong Du, Cailian Chen and Xinping Guan, "Location Privacy Preserving Dynamic Spectrum Auction in Cognitive Radio Network," In ***IEEE ICDCS'2013***, Philadelphia, Pennsylvania, July 08-11, 2013. (Acceptance ratio: 61/365=***16.7%***)

- **Sheng Liu** , Haojin Zhu, Shuai Li, Xu Li, Cailian Chen and Xinping Guan, "An Adaptive Deviation-tolerant Secure Scheme for Distributed Cooperative Spectrum Sensing," In ***GLOBECOM'2012***, Anaheim, California, 2012.

- Ziyun Zhu, **Sheng Liu**, Suguo Du, Xiaodong Lin, Haojin Zhu, "Relative Social-Influence-Aware Routing in Delay-Tolerant Networks," To appear in ***GLOBECOM'2013***, Atlanta, Georgia, 2013.

- **Sheng Liu**, Haojin Zhu, Li'an Li, Yao Liu, Cailian Chen, Xinping Guan, "Jamming Attacks Mitigation in Database-driven Cognitive Radio Networks," Submitted to *ICDCS' 2014*.

Research Experience

- **Center for Intelligent Wireless Networking and Cooperative Control** SJTU
  Research Assistant SEPT. 2011-PRESENT
  Project: The Research on Security and Privacy in Collaborative Spectrum Sensing in Cognitive Radio Networks (NSFC project)

  Description: My research focus lies on the security and privacy of the existing protocols and frameworks in cognitive radio networks, including spectrum sensing mechanism, dynamic spectrum auction, database-driven architecture. While identifying novel security problems, I also propose the corresponding countermeasures to thwart the attack or mitigate the detrimental effect. My works include:

  i. Identify a novel **location privacy** leakage problem in dynamic spectrum auction. As two well-separated bidders can utilize the same channel simultaneously in dynamic spectrum auction, each bidder is required to submit his location information to construct the interference relationship. As a result, the users' positions will be directly exposed to the auctioneer or the adversary eavesdropping the whole auction process. Besides, I also propose two other kinds of attacks compromising the location privacy by exploiting the users' bid channels and bid price. To address the problem, a new Location Privacy Preserving Dynamic Spectrum Auction based on the prefix membership verification scheme is introduced.

  ii. Identify a novel **jamming attack** in database-driven cognitive radio network (CRN). Different from the traditional jammer in CRNs who utilizes the limited sensing ability to detect the jamming objects (unoccupied channels), this sort of adversary submits an inquiry to the database to acquire all the available spectrum information. Based on this knowledge, the attacker can block the secondary users with a high successful probability even without the requisite of spectrum sensing. To mitigate this attack, we propose the Jamming-resistant Available Spectrum Retrieval protocol to differentiate the attacker and the legal users by constructing a new kind of client puzzle and using spectrum sensing to facilitate the puzzle solving process. Furthermore, experiments are implemented on Universal Software Radio Peripheral (USRP) to demonstrate the effectiveness of the attack and the scheme.

Professional Service

- **Reviewer for:** IEEE INFOCOM 2013 & 2014, IEEE Trans. on Parallel and Distributed Systems, IEEE Trans. on Industrial Electronics, IEEE Trans. on Vehicular Technology, IEEE CNS 2013, Computer Communications, Computer Networks, Journal of Electronics & Information Technology, IEEE Globecom 2012 & 2013, IEEE SmartGridComm 2012, MILCOM 2012, APCC

Awards and Honors

The Second Prize of National Post-Graduate Mathematic Contest in Modeling . . . . **SJTU** 2013
Outstanding Academic Scholarship . . . . **SJTU** 2013
The First Prize Scholarship . . . . **SJTU** 2012
Outstanding Academic Scholarship . . . . **SJTU** 2012
The Second Prize Scholarship . . . . **SJTU** 2011
Outstanding Graduates Award . . . . **HUST** 2011
Individual Scholarship . . . . **HUST** 2009
Scholarship of Academic Excellence (twice) . . . . **HUST** 2007,2008

Standard Tests & Technical Skills

- **TOEFL (iBT)**: Reading 30, Listening 23, Speaking 23, Writing 27, Total 103
- **GRE**: Verbal 150 (44%), Quantitative 170 (98%), Analytical Writing 4.0 (54%)
- **Languages:** C/C++, C#, Matlab, LaTeX, Java, Labview, HTML