

YAN (Lindsay) SUN

Assistant Professor

Department of Electrical, Computer, and Biomedical Engineering
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Education

Ph.D., Department of Electrical and Computer Engineering, University of Maryland, College Park, Maryland, August 2004.

M.S., Department of Electrical and Computer Engineering, University of Maryland, College Park, Maryland, May 2003.

B.S., Department of Electronics, with top 1 rank, Peking University, Beijing, China, June 1998.

Research Interests

Information and Network Security; Trust and Reputation in Distributed Computing Systems; Wireless Communications and Networking.

Awards and Honors

- ♦ WISE Fellowship, for attending Women's Institute in Summer Enrichment (WISE) program at the University of California, Berkeley. June 2007.
- ♦ NSF Faculty Early Career Development (CAREER) Award, Feb. 2007.
- ♦ NSF Travel Award for participating IEEE INFOCOM'04 in Hong Kong, March 2004.
- ♦ Graduate School Fellowship, University of Maryland, 1998-2000.
- ♦ Excellent Graduate Award (highest honor), Beijing University, 1998.

Research Experiences

Assistant Professor, July 2006 - present

Department of Electrical, Computer and Biomedical Engineering, University of Rhode Island

Research Areas:

- ♦ Wireless Communications and Networking
- ♦ Network Security
- ♦ Trust Establishment and Reputation Systems
- ♦ Privacy in Social Networks

NSF Advance Assistant Professor, Aug 2004 - July 2006

Department of Electrical and Computer Engineering, University of Rhode Island

Selected Research Topics:

- ♦ Secure Time Synchronization in Sensor Networks
- ♦ Energy Efficiency in Sensor Networks
- ♦ Quantitative Trust Modeling and Evaluation in Multi-hop Wireless Networks

Research Assistant, May 2001 - July 2004

Communication and Signal Processing Lab, the Institute for Systems Research
University of Maryland, College Park, Maryland

Selected Research Topics:

- ◆ Access Control for Group Communications.
- ◆ Multimedia Transmission over Broadband Wireless LAN.
- ◆ Transmit Diversity Techniques for Wireless Multicast.

Teaching Experiences

Curriculum Development,

Developed a new undergraduate course: ELE438-Information and Network Security;

Teaching, 2004-2008

ELE492/ELE594 – Information and Network Security, Spring 2005

ELE491 – Information and Network Security, Spring 2006

ELE438 – Information and Network Security, Spring 2007, 2008

ELE305 – Introduction to Computer Architecture, Fall 2006, 2007

ELE437 – Computer Communications, Fall 2008

Research-oriented advising, 2004-2006

Yafei Yang, PhD student (2005-present, expected to graduate in Dec. 2008.)

Xuan Li, PhD student (2007-present)

Wenkai Wang, PhD student (2007-present)

Yuhong Liu, PhD student (2007-present)

Greg Fellow, MS student (2006-2007, graduated in May 2007)

Siliang Li, MS Student (2005-2006)

Javier Escayola, exchange student (2005)

Robert Power, Undergraduate (2005-2006)

Westley Laquerre, Undergraduate (2004)

Co-advising: Qinyuan Feng, PhD student, Primary institution: Peking University (2007-present)

Co-advising: Gema Vinales, exchange student from Spain, Primary Advisor at URI: Nik Dholakia (2007-present)

Professional Activities

- ◆ Workshop/Conference Chair or Organizers
 - *Co-Chair*, Track of Trust, Reputation, Evidence and other Collaboration Know-how (TRECK), the 25th ACM Symposium on Applied Computing (ACM SAC'10), Sierre, Switzerland, March 2010.
 - *Publication Chair*, Fourth Annual Boston Area Architecture Workshop (BARC), Feb. 2006.
 - *Local Arrangement Chair*, IEEE International Workshop on Genomic Signal Processing and Statistics (Gensips), 2005.
- ◆ Proposal Review
 - NSF CISE Review Panel, March 2007.
 - Reviewer for US Army research office, April 2005.
 - Reviewer for Maryland Industrial Partnerships Program (MIPS), Oct, 2005.

◆ Technical Program Committees

INFOCOM'10	- IEEE, the 29th Conference on Computer Communications, Flagship conference in networking field
UC-SEC'09	- The 2009 International Workshop on Ubiquitous Computing Security.
INFOCOM'09	- IEEE, the 28th Conference on Computer Communications, Flagship conference in networking field
ICCCN'09	- The 18th International Conference on Computer Communications and Networks, Network Security and Privacy Track
GLOBECOM'09	- 51st annual IEEE Global Communications Conference
TRAM'08	- IEEE ICDCS Workshop, 2 nd International Workshop on Trust and Reputation Management in Massively Distributed Computing Systems
SPEUCS'07	- ACM Workshop on Security for Emerging Ubiquitous Wireless Networks
GLOBECOM'07	- 50th annual IEEE Global Communication Conference
MSN'06	- 2 nd Int. conference on Mobile Ad-hoc and Sensor Networks
CHINACOM'06	- 1 st Int. Conference on Communications and Networking in China
GLOBECOM'05	- 48th annual IEEE Global Communication Conference
BROADNET'05	- Broadband Wireless Networking Symposium

- ◆ Guest Editor, Special Issue on Wireless Network Security, Wiley's Journal of Wireless Communications and Mobile Computing, May 2005.

◆ Referee for Journals

- IEEE Signal Processing Letters, 2009
- EURASIP Journal on Wireless Communications and Networking, 2009
- IEEE Transactions on Mobile Computing, 2009
- Wireless Networks, The Journal of Mobile Communication, Computation and Information, 2009
- IEEE/ACM Transactions on Networking, 2008
- IEEE Transactions on Information Forensics and Security, 2007
- IEEE Transactions on Fuzzy Systems, 2008
- IEEE Transactions on Wireless Communications, 2004 - 2008
- IEEE Communication Magazine, 2004-2007
- IEEE Multimedia, 2005
- IEEE Journal on Selected Areas in Communications, 2004, 2007
- IEEE Transactions on Multimedia, 2002
- EURASIP Journal on Wireless Communications and Networking, 2007
- Wiley's International Journal of Communication Systems, 2008
- International Journal of Security and Networks (IJSN), 2005
- International Journal of Computers and Applications, 2003

Invited Talks and Panel

- ◆ "Trust Establishment: Theories and Applications", University of Connecticut, March 2008.

- ♦ “Formalizing Trust in Mobile Wireless Networks”, Research Review Day at WINLAB (Wireless Information Network Laboratory, the leading wireless networking lab in US.), Rutgers University, NJ, May 22, 2007.
- ♦ Panel: Security and Privacy for Emerging Wireless Networks, Research Review Day at WINLAB, Rutgers University, NJ, May 22, 2007.
- ♦ “Trust Modeling and Evaluation in Distributed Networks”, IEEE Providence Sector, April 19, 2007.
- ♦ “Trust Establishment in Distributed Networks: Vulnerability and Defense ”, University of Massachusetts Dartmouth, Feb. 2007
- ♦ “Tutorial on Wireless Multicast Security”, Network/Computer Security Workshop 2006, Lehigh University, May 2006.
- ♦ “Trust Model in Ad hoc networks”, 19th IEEE Annual Computer Communications Workshop, Bonita Springs, Florida, Oct. 2004.
- ♦ “Securing Group Dynamic Membership Information over Multicast”, HKUST Networking Workshop, Hong Kong University of Science and Technology, Hong Kong, March 2004.

Affiliations

IEEE Signal Processing Society, Communication Society and Computer Society
IEEE Women in Engineering

Publications

[Book]



Yan Sun, Wade Trappe, K. J. Ray Liu, “Network-Aware Security for Group Communications”, ISBN 978-0-387-68846-6, Springer, Oct. 2007.

[Refereed Book Chapters]

Yan Sun and Zhu Han, “Trusted Cooperative Transmission: Turn a Security Weakness into Security Enhancement”, under review, in *Securing Wireless Communications at the Physical Layer*, Eds, Wade Trappe and Ruoheng Liu, under review, Springer-Verlag, expected 2009.

[Refereed Journal Articles]

Published & Accepted:

1. Yafei Yang, Yan Sun, Steven Kay, and Qing Yang, “Securing Rating Aggregation Systems using Statistical Detectors and Trust”, *IEEE Transactions on Information Forensics and Security*, accepted, notified in August 2009.
2. Zhu Han and Yan Sun, “Distributed Cooperative Transmission with Unreliable and Distrustful Relay Channels”, *EURASIP Journal on Wireless Communications and Networking*, accepted, notified in Sept 2009.
3. Yafei Yang, Qinyuan Feng, Yan Sun and Yafei Dai, “Dishonest Behaviors in Online Rating Systems: Cyber Competition, Attack Models and Attack Generator”, *Journal of Computer Science Technology, Special Issues on Trust and Reputation Management in Future Computing Systems and Applications*, accepted, notified in Dec. 2008.
4. Yan Sun, Zhu Han, and K. J. Ray Liu, “Defense of Trust Management Vulnerabilities in Distributed Networks”, *IEEE Communications Magazine, Feature Topic on Security in Mobile Ad Hoc and Sensor Networks*, vol. 46, no. 2, pp.112-119, Feb. 2008.
5. Yan Sun, and K. J. Ray Liu, “Hierarchical Group Access Control for Secure Multicast Communications”, *IEEE/ACM Transactions on Networking*, vol. 15, no. 6, pp.1514-1526, Dec. 2007.
6. Yan Sun and K. J. Ray Liu, “Analysis and Protection of Dynamic Membership Information for Group Key Distribution Schemes”, *IEEE Transactions on Information Forensics and Security*, vol. 2, no. 2, pp.213-226, June 2007.
7. Wei Yu, Yan Sun, and K. J. Ray Liu, “Optimizing Rekeying Cost for Contributory Group Key Agreement Schemes”, *IEEE Transactions on Dependable and Secure Computing*, vol. 4, no. 3, pp.228-242, July-Sept 2007.
8. Yan Sun, Wei Yu, Zhu Han, and K. J. Ray Liu, “Information Theoretic Framework of Trust Modeling and Evaluation for Ad Hoc Networks”, *IEEE Journal on Selected Areas in Communications*, vol. 24, no. 2, pp.305- 317, Feb. 2006.

9. Y. Mao, Yan Sun, Min Wu, and K. J. Ray Liu, "JET: Dynamic Joint-Exist-Tree Amortization and Scheduling for Contributory Key Agreement", *IEEE/ACM Transactions on Networking*, vol. 14, no. 5, pp.1128-1140, Oct. 2006.
10. Charles Pandana, Yan Sun and K. J. Ray Liu, "Channel-Aware Priority Transmission scheme using Joint Channel Estimation and Data Loading over OFDM systems", *IEEE Transactions on Signal Processing*, vol. 53, no. 8, pp.3297-3310, August 2005.
11. Yan Sun, Wade Trappe, and K. J. Ray Liu, "A Scalable Multicast Key Management Scheme for Heterogeneous Wireless Networks", vol. 12, no. 4, pp.653-666, *IEEE/ACM Transactions on Networking*, August 2004.

Under Revision & Under Review:

- ◆ Qinyuan Feng, Yan Sun, Ling Liu, Yafei Yang; Yafei Dai, "Voting Systems with Trust Mechanisms in Cyberspace: Vulnerabilities and Defenses", *IEEE Transactions on Knowledge & Data Engineering*, revision submitted in Aug 2009.
- ◆ Wenkai Wang, Husheng Li, Yan Sun, and Zhu Han, "Securing Collaborative Spectrum Sensing against Untrustworthy Secondary Users in Cognitive Radio Networks", *EURASIP Journal on Advances in Signal Processing*, revision submitted in Sept 2009.
- ◆ Liudong Xing; Prashanthi Boddu, Yan Sun, Wendai Wang, "Reliability Analysis of Static and Dynamic Fault-Tolerant Systems subject to Probabilistic Common-Cause Failures", *Journal of Risk and Reliability*, submitted in May 2009.

[Refereed Conference Papers]

Published & Accepted:

Topic: Trust and Reputation Systems; Security and Privacy

1. Qinyuan Feng, Yu Wu, Yan Lindsay Sun, Jing Jiang, Yafei Dai, "User Behavior Modeling in Peer-to-Peer File Sharing Networks: Dissecting Download and Removal Actions", in Proc. *34th International Conference on Acoustics, Speech, and Signal Processing (ICASSP'09)*, 2009.
2. Yuhong Liu, Yafei Yang, and Yan Lindsay Sun, "Detection of Collusion Behaviors in Online Reputation Systems", in Proc. *Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2008
3. Yafei Yang, Yan Sun, Steven Kay, and Qing Yang, "Defending Online Reputation Systems against Collaborative Unfair Raters through Signal Modeling and Trust", in Proc. *24th ACM Symposium on Applied Computing (ACM SAC'09)*, Honolulu, Hawaii, March 8 - 12 2009.
4. Yafei Yang, Qinyuan Feng, Yan Sun and Yafei Dai, "Reputation Trap: An Powerful Attack on Reputation System of File Sharing P2P Environment", in Proc. *4th International Conference on Security and Privacy in Communication Networks (SecureComm'08, acceptance ratio 20%)*, Istanbul, Turkey, Sept. 2008.
5. Qinyuan Feng, Yafei Yang, Yan Sun, and Yafei Dai, "Modeling Attack Behaviors in Rating Systems (invited paper)", in Proc. *ICDCS Workshop, 2nd International Workshop on Trust and Reputation Management in Massively Distributed Computing Systems (IEEE TRAM'08)*, Beijing, China, July 2008.
6. Yafei Yang, Yan Sun, Jin Ren and Qing Yang, "Building Trust in Online Rating Systems through Signal Modeling", in Proc. *ICDCS Workshop, 1st International Workshop on Trust and*

Reputation Management in Massively Distributed Computing Systems (IEEE TRAM'07), Toronto, Canada, June 2007.

7. Yan Sun and Yafei Yang, "Trust Establishment in Distributed Networks: Analysis and Modeling", in Proc. *IEEE International Conference on Communications (ICC'07)*, Glasgow, Scotland, June. 2007.
8. Yan Sun, Zhu Han, Wei Yu, and K. J. Ray Liu, "A Trust Evaluation Framework in Distributed Networks: Vulnerability Analysis and Defense against Attacks", in Proc. *IEEE INFOCOM'06*, (18% acceptance ratio), Barcelona, April 2006.
9. Yan Sun, Zhu Han, Wei Yu and K.J. Ray Liu, "Attacks on Trust Evaluation in Distributed Networks", in Proc. *IEEE 40th Annual Conference on Information Science and Systems (CISS'06)*, Princeton, NJ, March 2006.
10. Yan Sun, Wei Yu, Zhu Han, and K. J. Ray Liu, "Trust Modeling and Evaluation in Ad hoc Networks", in Proc. *IEEE Global Communication Conference (Globecom'05)*, St. Louis, MO, Nov-Dec 2005.

Topic: Wireless Communications and Networking; Security

11. Wenkai Wang, Husheng Li, Yan Sun, Zhu Han, "CatchIt: Detect Malicious Nodes in Collaborative Spectrum Sensing", *to appear, in Proc. IEEE Global Communication Conference (Globecom'09)*, Honolulu, Hawaii, Nov-Dec 2009.
12. Wenkai Wang, Husheng Li, Yan (Lindsay) Sun, and Zhu Han, "Attack-Proof Collaborative Spectrum Sensing in Cognitive Radio Networks", in Proc. *43rd Annual Conference on Information Science and Systems (CISS'09)*, Baltimore MD, March 2009.
13. Liudong Xing, Prashanthi Boddu, and Yan Sun, "System Reliability Analysis Considering Fatal and Non-Fatal Shocks", in Proc. *55th Annual Reliability & Maintainability Symposium*, Fort Worth, TX, January 2009.
14. Yafei Yang and Yan Sun, "Securing Time-synchronization Protocols in Sensor Networks: Attack Detection and Self-healing", in Proc. *IEEE Global Communication Conference (Globecom'08)*, New Orleans, LA, Nov-Dec 2008.
15. Zhu Han and Yan Sun, "Wave Cooperative Transmission Protocol for Underwater Acoustic Communications", in Proc. *IEEE International Conference on Communications (ICC'08)*, Beijing China, May 2008.
16. Zhu Han and Yan Sun, "Self-Learning Cooperative Transmission-Coping with Unreliability due to Mobility, Channel Estimation Errors, and Untrustworthy Nodes", in Proc. *IEEE Global Communication Conference (Globecom'07)*, Washington DC, Dec. 2007.
17. Zhu Han and Yan Sun, "Securing Cooperative Transmission in Wireless Communications", in Proc. *1st ACM Workshop on Security for Emerging Ubiquitous Wireless Networks*, Philadelphia, PA, August 2007.
18. Yafei Yang and Yan Sun, "PETO: Power-Efficient Transmission with Outsourcing in Wireless Sensor Networks", in Proc. *IEEE Global Communication Conference (Globecom'06)*, San Francisco, CA, Dec. 2006.
19. Weijun Xiao, Yan Sun, Yinan Liu, and Qing Yang, "TEA: Transmission Error Approximation for Distance Estimation between Two Zigbee Devices", in Proc. *International Workshop on Networking, Architecture and Storage (IWNAS'06)*, Shengyang, China, Aug 2006.
20. Wei Yu, Yan Sun, and K.J. Ray Liu, "HADOF: Defense against Routing Disruptions in Mobile Ad Hoc Networks", in Proc. *IEEE INFOCOM'05*, (17% acceptance ratio), Miami, March 2005.

21. Yan Sun, and K. J. Ray Liu, "Transmit Diversity Techniques for Multicasting over Wireless Networks", in Proc. *IEEE Wireless Communications and Networking Conference (WCNC'04)*, Atlanta, Georgia, March 2004.
22. C. Pandana, Yan Sun, and K.J. Ray Liu, "Channel Aware Unequal Error Protection for Image Transmission over Broadband Wireless LAN", in Proc. *IEEE Int. Conf. on Image Processing (ICIP'03)*, Barcelona, Spain, Sept. 2003.
23. Yan Sun, and K. J. Ray Liu, "Multi-layer Management for Secure Multimedia Multicast Communications", in Proc. *IEEE International conferences on Multimedia and Expo (ICME'03)*, Vol II, pp 205-208, Baltimore, MD, July 2003.
24. Yan Sun, C. Pandana, Xiaowen Wang, and K.J. Ray Liu, "A Joint Channel Estimation and Unequal Error Protection Scheme for Image Transmission in Wireless OFDM Systems", in Proc. *IEEE International Workshop on Multimedia Signal Processing (MMSP'02)*, St. Thomas, US Virgin Islands, Dec. 2002.
25. Yan Sun, Xiaowen Wang, K.J. Ray Liu, "A Joint Channel Estimation and Unequal Error Protection Scheme for Video Transmission in OFDM systems", in Proc. *IEEE Int. Conf. on Image Processing (ICIP'02)*, Vol1, pp 549-552, Rochester, NY, Sep. 2002.

Topic: Key Management and Secure Group Communications

26. Wei Yu, Yan Sun, and K. J. Ray Liu, "Minimization of Rekeying Cost for Contributory Group Communications", in Proc. *IEEE Global Communication Conference (Globecom'05)*, St. Louis, MO, Nov-Dec 2005.
27. Yan Sun, and K. J. Ray Liu, "Securing Dynamic Membership Information in Multicast Communications", in Proc. *IEEE INFOCOM'04* (18% acceptance ratio), Hong Kong, March 2004.
28. Yan Sun, and K. J. Ray Liu, "Scalable Hierarchical Access Control in Secure Group Communications", in Proc. *IEEE INFOCOM'04* (18% acceptance ratio), Hong Kong, March 2004.
29. Yinian Mao, Yan Sun, Min Wu and K. J. Ray Liu, "Dynamic Join and Exit Amortization and Scheduling for Time-Efficient Group Key Agreement", in Proc. *IEEE INFOCOM'04* (18% acceptance ratio), Hong Kong, March 2004.
30. Yan Sun, and K.J. Ray Liu, "Securing Dynamic Group Membership Information over Multicast: Attacks and Immunization", in Proc. *IEEE Global Communication Conference (Globecom'03)*, San Francisco, CA, Dec. 2003.
31. Yan Sun, Wade Trappe, and K.J. Ray Liu, "Topology-aware Key Management Schemes for Wireless Multicast", in Proc. *IEEE Global Communication Conference (Globecom'03)*, San Francisco, CA, Dec. 2003.
32. Yan Sun, Wade Trappe, and K.J. Ray Liu, " An Efficient Key management Scheme for Secure Wireless Multicast", in Proc. *IEEE Int. Conf. on Communication (ICC'02)*, pp 1236 -1240 Vol 2, New York City, May 2002.
33. Bin Sun, Wade Trappe, Yan Sun, and K.J. Ray Liu, "A time-efficient contributory key agreement scheme for secure group communications", in Proc. *IEEE Int. Conf. on Communication (ICC'02)*, pp 1159 -1163 Vol 2, New York City, May 2002.

Under Review:

- ◆ Qinyuan Feng, Ling Liu, Yan Sun, Ting Yu, Yafei Dai, “Find Your Favorite Star with MAPS: A Personalized Multi-Attribute Ranking Algorithm”, *IEEE International Conference on Data Engineering (ICDE)*, submitted in June 2009.
- ◆ Weijun Xiao, He Huang, Yan Sun, and Qing Yang, “Promise of Embedded System with GPU in Artificial Leg Control: Enabling Time-frequency Feature Extraction from Electromyography,” the *31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, submitted in April 2009.

Patent

1. US Patent (Pending), “Methods for defense against collaborative, profit-driven manipulations in online rating systems”, with Yafei Yang, Qing (Ken) Yang and Steven Kay, filed in May 2008.
2. US Patent (Pending) “APS: Method and Apparatus for Approximate Positioning System in Personal Area Networks Using Zigbee”, with Qing(Ken) Yang, Weijun Xiao and Yinan Liu, filed in April 2006.