

Weichao Wang

Department of Software and
Information Systems
UNC-Charlotte
9201 Univ. City Blvd
Charlotte, NC 28223

Phone: 704-687-7987
Fax: 704-687-6065
Email: weichaowang@uncc.edu
URL: <http://www.sis.uncc.edu/~wwang22/>

a. Education

Tsinghua University, P.R. China	Computer Science	B.S. 1998
Graduate with honor. One of three awardees in 160 graduate		
Tsinghua University, P.R. China	Computer Science	M.S. 2000
Purdue University	Computer Science	M.S. 2002
Purdue University	Computer Science	Ph.D. 2005
Thesis: Securing Wireless Network Topology and Routing		
Advisor: Dr. Bharat Bhargava		

b. Employments

Univ. of North Carolina at Charlotte	May 2007 to present
Assistant Professor in Dept. of Software and Information Systems	
University of Kansas	August 2005 to May 2007
Assistant Professor in Electrical Engineering and Computer Science	
Purdue University	August 2000 to August 2005
Research and Teaching Assistant	
Microsoft Corporation	May 2003 to August 2003
Summer Internship	
Software Technology Group, Inc.	May 2001 to July 2001
Summer Internship	
Tsinghua University, P.R. China	August 1998 to August 2000
Research Assistant	

Part I: Research Activities

c. Publications

(i) Journal Publications

(1) Visualization of Wormholes in Underwater Sensor Networks: A Distributed Approach, International Journal of Security and Networks (IJSN), volume 3, No. 1, pp 10-23, 2008. W. Wang, J. Kong, B. Bhargava, and M. Gerla.

(2) Stateless Key Distribution for Secure Intra and Inter-group Multicast in Mobile Wireless Networks, Elsevier Computer Networks, volume 51, issue 15, pp 4303--4321, Oct. 2007. W. Wang and T. Stransky.

(3) Interactive Wormhole Detection and Evaluation, Palgrave Information Visualization Journal (IVS), special issue on Visual Analytics, Volume 6, Issue 1, pages 3--17, January 2007. W. Wang and A. Lu.

(4) Wireless networking security: open issues in trust, management, interoperation, and measurement, International Journal of Security and Networks (IJSN), vol. 1, no. 1/2, pp. 84--94, 2006. J. Evans, W. Wang, and B. Ewy.

(5) Trust-Based Privacy Preservation for Peer-to-peer Data Sharing, IEEE Transactions on Systems, Man and Cybernetics (Part A, Systems and Humans), vol. 36, issue 3, pp. 498--502, May 2006. Y. Lu, W. Wang, D. Xu, and B. Bhargava.

(6) Defending against Wormhole Attacks in Mobile Ad Hoc Networks, Wireless Communications and Mobile Computing (WCMC), vol. 6, issue 4, pp. 483-503, June 2006. W. Wang, B. Bhargava, Y. Lu, and X. Wu.

(7) Integrating Heterogeneous Wireless Technologies: A Cellular-assisted Mobile Ad Hoc Network, Kluwer Mobile Networks and Applications (MONET), Special Issue on Integration of Heterogeneous Wireless Technologies, (9)393--408, 2004. B. Bhargava, X. Wu, Y. Lu, and W. Wang.

(8) Secure Wireless Network with Movable Base Stations, IEICE Transactions on Communications, IEICE/IEEE Joint Special Issue on Assurance Systems and Networks, Vol. E86-B, No. 10, pp. 2922--2930, 2003. Y. Lu, B. Bhargava, W. Wang, Y. Zhong, and X. Wu.

(ii) Conference and Workshop Publications

(1) Using Deductive Knowledge to Improve Cryptographic Protocol Verification, accepted to appear in IEEE Military Communications Conference (MILCOM 2009), Boston, October 2009. Zhiwei Li and W. Wang.

(2) Building a Dark PicoNet upon Bluetooth Interfaces of Computers, accepted to appear in IEEE Military Communications Conference (MILCOM 2009), Boston, October 2009. Rodney Owens and W. Wang.

(3) Achieving Configurable Location Privacy in Location Based Routing for MANET, in Proceedings of IEEE Military Communications Conference (MILCOM 2008), San Diego, November 2008. W. Wang and C. Cui.

(4) A Digital Lego Set and Exercises for Teaching Security Protocols, in Proceedings of Colloquium for Information Systems Security Education (CISSE), pp 26-33, Dallas, June 2008. W. Wang, A. Lu, L. Yu, and Z. Li.

(5) Secure Group-based Information Sharing in Mobile Ad Hoc Networks, in Proceedings of IEEE International Conference on Communications (ICC), Beijing, China, May 2008. W. Wang and Yu Wang.

(6) Homogeneous Security in Heterogeneous Networks: Towards a Generic Security Management Protocol, in Proceedings of Military Communications Conference (MilCom), 2007. Justin P. Rohrer, W. Wang, and James P.G. Sterbenz.

(7) HiFi-WiN: Hybrid Integrated Fiber-Wireless Networking for Broadband Metropolitan Area Access, in Proceedings of the Virginia Tech Symposium on Wireless Personal Communications, June 2007. V. Muralidharan, A. Wyglinski, and W. Wang.

- (8) Visualization Assisted Detection of Sybil Attacks in Wireless Networks**, in Proceedings of ACM Workshop on Visualization for Computer Security (VizSEC), pages 51—60, in conjunction with ACM CCS, 2006. W. Wang, and A. Lu.
- (9) Interactive Wormhole Detection in Large Scale Wireless Networks**, in Proceedings of IEEE Symposium on Visual Analytics Science and Technology (VAST), pages 99—106, 2006. W. Wang, and A. Lu.
- (10) Key Distribution and Update for Secure Inter-group Multicast Communication**, in Proceedings of ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN), in conjunction with ACM CCS, 2005. W. Wang, and B. Bhargava.
- (11) Low-cost Attacks against Packet Delivery, Localization and Time Synchronization Services in Under-Water Sensor Networks**, in Proceedings of ACM Workshop on Wireless Security (WiSe), in conjunction with MobiCom, 2005. J. Kong, Z. Ji, W. Wang, M. Gerla, R. Bagrodia, and B. Bhargava.
- (12) Visualization of Wormholes in Sensor Networks**, in Proceedings of ACM Workshop on Wireless Security (WiSe), in conjunction with MobiCom'04, October, 2004. W. Wang, and B. Bhargava.
- (13) Trust-Based Privacy Preservation for Peer-to-peer Media Streaming**, in Proceedings of NSF/NSA/AFRL Workshop on Secure Knowledge Management (SKM), September, 2004. Y. Lu, W. Wang, D. Xu, and B. Bhargava.
- (14) On Security Study of Two Distance Vector Routing Protocols for Mobile Ad Hoc Networks**, in Proceedings of IEEE International Conference on Pervasive Computing and Communications (PerCom'03), Dallas-Fort Worth, Texas, March, 2003. W. Wang, Y. Lu, and B. Bhargava.
- (15) Study of Distance Vector Routing Protocols for Mobile Ad Hoc Networks**, in Proceedings of IEEE International Conference on Pervasive Computing and Communications (PerCom'03), Dallas-Fort Worth, Texas, March, 2003. Y. Lu, W. Wang, and B. Bhargava.
- (16) On Vulnerability and Protection of Ad Hoc On-demand Distance Vector Protocol**, in Proceedings of International Conference on Telecommunications (ICT'03), February, 2003. W. Wang, Y. Lu, and B. Bhargava.
- (17) Hierarchical Structure for Supporting Movable Base Stations in Wireless Networks**, in Proceedings of International Conference on Telecommunications (ICT'03), February, 2003. Y. Lu, W. Wang, and B. Bhargava.

(iii) Papers under Review

- (1) Sybil Attack Detection through Global Topology Visualization**, submitted to and under review of Palgrave Information Visualization Journal (IVS). A. Lu and W. Wang.
- (2) Secure and Efficient Access to Outsourced Data**, submitted to ACM Cloud Computing Security Workshop (CCSW) 2009. W. Wang, Z. Li, R. Owens, B. Bhargava, and M. Linderman.
- (3) Defending against Collaborative Packet Drop Attacks on MANETs**, submitted to IEEE International workshop on Dependable Network Computing and Mobile Systems (DNCMS) 2009. W. Wang, B. Bhargava, and M. Linderman.

d. Research Support

(i) Funded Projects

- (1) “Instance Composition for Realistic Simulation of Large Scale Wireless Networks”, Funded by KUCR NFGRF, 2006. PI: Weichao Wang. Total budget: \$8,000.
- (2) “Improving Highway Work Zone Safety,” Funded by Kansas Department of Transportation/Federal Highway Administration, 2007. PI: Yong Bai, Co-PI: Weichao Wang, S. Schrock, O. Chong, P. Atchley, D. Perlmetter, Z. Gao, and L. Song. Total budget: \$316,495.
- (3) “Evaluation of Rapid Deployment Mesh Networking for Work Zones”, Funded by Smart Work Zone Deployment Initiative, under the guidance of Iowa, Kansas, and Missouri Department of Transportation, 2007. PI: Steven Schrock, Co-PI: Weichao Wang. Total budget: \$45,962.
- (4) “Bridging Security Primitives and Protocols: A Digital LEGO Set for Information Assurance Courses”, Funded by NSF CCLI program under award #0754592, February 2007 to February 2010. PI: Weichao Wang. Total budget: \$78,460.
- (5) “A Knowledge based Approach to Verify Security Protocols”, funded by Charlotte Research Institute under Wachovia Foundation Fund for Faculty Excellence, July 2008. \$4,000. PI: Weichao Wang.
- (6) “Secure and Configurable Data Dissemination among Multiple Sensor Groups”, funded by Faculty Research Grant of UNCC for 2009 to 2010 school year. \$6,000. PI: Weichao Wang.

(ii) Proposals under Review

- (1) “Using Fact Bases to Reason about Knowledge in Cryptographic Protocols”. PI: Weichao Wang. Submitted to DoD white paper for Information Assurance program. Total budget: \$259,141.
- (2) “Collaborative Research: A Knowledge-Based Instructional and Laboratory Environment for Computer Security Education”. PI: Weichao Wang. Other Investigators: Aidong Lu (UNCC), Ping Ji (CUNY), Joe Evans (KU). Submitted to NSF CCLI Phase Two Program. Budget from UNCC: \$408,331. Total budget: \$498,261.
- (3) “NetSE:Small: Topological Analysis and Design for Large Scale Social and Communication Networks”. PI: Yu Wang. Co-PI: Weichao Wang and Xintao Wu. Submitted to NSF Crosscutting NetSE Program. Total budget: \$405,926.

e. Presentations and Invited Talks (selected)

- (1) **Achieving Configurable Location Privacy in Location Based Routing for MANET**, presentation on IEEE Military Communications Conference (MILCOM 2008), San Diego, November 2008. W. Wang.
- (2) **Knowledge Based Security Protocol Verification System for Bridging Security Primitives and Protocols in IA Courses**, presentation on NSF CCLI PI meeting, Washington DC, August, 2008. W. Wang.
- (3) **A Digital Lego Set and Exercises for Teaching Security Protocols**, presentation on Colloquium for Information Systems Security Education (CISSE), Dallas, June 2008. W. Wang.

(4) Protecting Topology of Self-organized Wireless Networks: A Visualization Approach, invited talk at College of Computer Science and Electronic Information, Guangxi University, May 2008. Weichao Wang.

(5) Protecting Topology of Self-organized Wireless Networks: A Visualization Approach, invited talk at School of Electronics Engineering and Computer Science, Peking University, May 2008. Weichao Wang.

(6) Secure Group-based Information Sharing in Mobile Ad Hoc Networks, presentation on IEEE International Conference on Communications (ICC), Beijing, China, May 2008. W. Wang.

(7) Securing mobile ad hoc and sensor networks with light weight methods, invited talk at Department of Computer Science, Tsinghua University, China, May 2007. W. Wang.

(8) Visualization Assisted Detection of Sybil Attacks in Wireless Networks, presentation on ACM Workshop on Visualization for Computer Security (VizSEC), Alexandria, VA, November 2006. W. Wang.

(9) Key Distribution and Update for Secure Inter-group Multicast Communication, presentation on ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN), in conjunction with ACM CCS, Alexandria VA, November 2005. W. Wang.

Part II: Teaching and Advising

f. Student Advising

(i) PhD Students

Zhiwei Li

Advisor: Weichao Wang August/07 – Present
Topic: Knowledge based security protocol analysis and verification
Progress: Passed qualification exam in Dec 2008

Rodney Owens

Advisor: Weichao Wang August/08 – Present
Topic: Usable computer security
Progress: first paper accepted by Milcom 2009

Cheng Cui

Advisor: Weichao Wang August/07 – August/08
Topic: Sensor network security
Progress: transfer to LSU in 2008

Siyuan Chen

Advisor: Yu Wang August/07 – Present
Committee: Weichao Wang, Teresa Dahlberg
Topic: Topology control in wireless networks
Progress: Passed qualification exam in May 2009

(ii) Master Students

Kyle Coble

Advisor: Weichao Wang June/09 – Present
Topic: Usable computer security

Abhishek Dnyate

Advisor: Aidong Lu Aug/07 – Aug/08
Committee: Weichao Wang, Yu Wang
Topic: Visualization Assisted Sybil Attack Detection
Progress: graduated in August 2008

(iii) Undergraduate Research

Rodney Owens

Advisor: Weichao Wang Aug/07 – July/08
Topic: Bluetooth security
Progress: became a PhD student in Aug/08

Cher Vue

Advisor: Weichao Wang Aug/08 – May/09
Topic: malware propagation in sensor networks
Progress: graduated in May 2009

g. Courses Taught and Evaluation

- Spr/2009 ITIS 3200: “Introduction to Information Security and Privacy”
24 undergraduate students. Teaching evaluation: 4.75/5.
- Fall/2008 ITIS 3200: “Introduction to Information Security and Privacy”
40 undergraduate students. Teaching evaluation: 4.52/5.
- Spr/2008 ITIS 6010/8010: “Special Topics on Wireless Network Security”
5 graduate students. Teaching evaluation: 4.80/5.
- Fall/2007 ITIS 3200: “Introduction to Information Security and Privacy”
37 undergraduate students. Teaching evaluation: 3.75/5.
- Spr/2007 EECS 168: “Programming I”
32 undergraduate students. Teaching evaluation: 4.70/5.
- Spr/2007 EECS 700: “Network Security”
24 graduate students. Teaching evaluation: 4.88/5.
- Fall/2006 EECS 800: “Wireless Network Security”
14 graduate students. Teaching evaluation: 4.64/5.
- Spr/2006 EECS 690: “Cryptography and Information Security”
36 under and graduate students. Teaching evaluation: 4.37/5.

Fall/2005 EECS 800: “Advanced Cryptography”.
8 graduate students. Teaching evaluation: 4.5/5.

h. Curriculum Development

(1) Developed the course “Special Topic in Software and Information Systems: Wireless Network Security” and offered it for the first time at UNC-Charlotte in the Spring semester of 2008.

i. Software Package

(1) We develop a 2-Dimensional Digital Lego System for Cryptographic Protocol Analysis and Instruction (supported by NSF). This software package is adopted by the course ITIS 3200 “Introduction to Information Security and Privacy” in Fall 2008 and evaluated by more than 20 undergraduate students.

j. Awards and Honors

(1) Nominated by the SIS department for the College of Computing and Informatics (CCI) Undergraduate Teaching Award, May 2009.

Part III: Services

k. Internal Services

(1) Jan/09: Help the department to accomplish the Information Assurance (IA) courseware certification/recertification procedure under the joint management of NSA and DHS. We accomplish the recertification of Standard 4011 and file a new certification of the Standard 4013 at the Entry level. Both applications have been approved by NSA and CNSS.

(2) Fall/08 – Spr/09: member of the SIS Department Undergraduate Committee.

(3) Fall/08 – Spr/09: member of the College Graduate Student Recruitment Committee.

(4) Fall/2007: Coordinator of the College of Computing and Informatics (CCI) Graduate Seminars.

(5) Fall/07 – Spr/2008: member of the Department Tech Report Organization Committee.

l. External Services

(i) Research Program Reviewer

(1) NASA Advanced Information Systems Technology (AIST) program, 2006.

(2) Innovation and Technology Support Program of the Hong Kong Special Administrative Region, 2009.

(3) Strategic Project Grants (SPG) program of the Natural Sciences and Engineering Research Council of Canada (NSERC), 2009.

(4) Department of Energy (DoE) Smart Grid Investment Grant Program (SGIG), 2009.

(ii) Editorial Board Member of Journal

- (1) International Journal of Communication Networks and Distributed Systems (IJCNDS).

(iii) Reviewer for Journals

- (1) IEEE Communications Magazine
- (2) IEEE/ACM Transactions on Network (ToN)
- (3) IEEE Transactions on Systems, Man and Cybernetics
- (4) IEEE Transactions on Mobile Computing
- (5) ACM Transactions on Sensor Networks
- (6) IEEE Transactions on Parallel and Distributed Systems
- (7) IEEE Transactions on Information Forensics and Security
- (8) IEEE Transactions on Vehicular Technology (TVT)
- (9) IEEE Network Magazine
- (10) Springer Journal of Intelligent Information Systems (JIIS);
- (11) Wiley's Security and Communication Networks;
- (12) Wiley's Wireless Communications and Mobile Computing;
- (13) Elsevier Ad Hoc Networks;
- (14) Elsevier Computers and Electrical Engineering Journal;
- (15) Elsevier Computer Communications;
- (16) Elsevier INFORMATION SCIENCES;
- (17) Elsevier Journal of Systems and Software;
- (18) Elsevier Computers and Security (COSE);
- (19) Journal of Computer Security (JCS);
- (20) Information Processing Letters;
- (21) International Journal of Security and Networks (IJSN);
- (22) International Journal of Communication Systems (IJCS);
- (23) International Journal of Parallel, Emergent and Distributed Systems (IJPEDS);
- (24) International Journal of Autonomous and Adaptive Communications Systems (IAACS);
- (25) EURASIP Journal on Wireless Communications and Networking (JWCN).

(iv) TPC Members of Conferences (selected)

- (1) IEEE IPCCC: 2009, 2008, 2007
- (2) IEEE GlobeCom: 2009
- (3) IEEE IC3N: 2007, 2006
- (4) IEEE International Conference on Communications (ICC): 2010, 2009, 2008
- (5) IEEE International Conference on Advanced Information Networking and Application (AINA): 2010, 2009
- (6) IEEE Consumer Communications and Networking Conference (CCNC): 2010
- (7) International Conference on Network and System Security (NSS): 2009

- (8) IEEE International Conference on High Performance Computing and Communications (HPCC): 2009
 - (9) IEEE International Conference on Parallel and Distributed Systems (ICPADS): 2008, 2007
 - (10) International Conference on Mobile Ad-hoc and Sensor Networks (MSN): 2006
 - (11) IEEE LCN Workshop on Security in Communications Networks (WSCN or WNS or Sick): 2009, 2008, 2007, 2006
 - (12) ACM International Workshop on Foundations of Wireless Ad Hoc and Sensor Networking and Computing: 2009, 2008
 - (13) International Workshop on Specialized Ad Hoc Networks and Systems (SAHNS): 2009, 2007
 - (14) IEEE International Workshop on Wireless Network Algorithm and Theory (WiNA): 2009
 - (15) International Workshop on Localized Algorithms and Protocols for Wireless Sensor Networks (LOCALGOS): 2009
 - (16) IEEE International Workshop on Cyberspace Safety and Security (CSS): 2008
- (v) Reviewer of Conferences (selected)**
- (1) IEEE WCNC: 2007, 2006
 - (2) IEEE ICC: 2007, 2006
 - (3) ACM MobiWAC: 2006
 - (4) NDSS: 2006
 - (5) IEEE IPCCC: 2006
 - (6) NOSSDAV: 2005