Wenbo He

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RESEARCH INTERESTS

Networked Embedded Systems, Mobile & Pervasive Computing, Privacy & Security, Control of Computing and Communication Systems, Cloud Computing and Data Centers, etc.

PROFESSIONAL EXPERIENCE

Assistant Professor,   *September 2011 - now*
School of Computer Science, McGill University

Assistant Professor,   *January 2010 - August 2011*
Department of Electrical Engineering, University of Nebraska-Lincoln

Assistant Professor,   *August 2008 - December 2009*
Department of Computer Science, University of New Mexico

Intern Researcher,   *May 2007 - August 2007*
Microsoft Research, Redmond, WA (Networked Embedded Computing Group)

Software Engineer,   *August 2000 - January 2005*
Cisco Systems, Inc., Champaign, IL (Network Security Management Group)

EDUCATION

University of Illinois at Urbana-Champaign, Urbana, IL   *January 2005 — August 2008*
    Ph.D., Computer Science
    Advisor: Klara Nahrstedt

University of Illinois at Urbana-Champaign, Urbana, IL   *August 1998 — August 2000*
    Master of Electrical Engineering
    Advisor: Muriel Médard

Tsinghua University, Beijing, China   *September 1995 — June 1998*
    Master of Control Theory and Applications, Department of Automation

Harbin Engineering University, Heilongjiang, China   *September 1991 — July 1995*
    B.E. with honors, Department of Automatic Control

SELECTED AWARDS

Best Paper Award   *2011*
ACM Conference on Wireless Network Security (WiSec'11)

Best Paper Award   *2008*
IEEE Transactions on Industrial Informatics

NSF TRUST Fellowship   *2007, 2009*
for summer program on ubiquitous secure technology, Cyber-security and privacy

Vodafone-U.S. Foundation Fellowship ,   *2005 - 2006, 2006 - 2007, 2007 - 2008*
by School of Engineering, University of Illinois at Urbana-Champaign

C. W. Gear Outstanding Graduate Student Award,   *2007*
by Department of Computer Science, University of Illinois at Urbana-Champaign

Best Poster Presentation Award in Vodafone Symposium   *March 2007*

Mavis Memorial Fund Scholarship Award ,   *2006*
by School of Engineering, University of Illinois at Urbana-Champaign

Meritorious Award,   *1993*
in the Mathematical Contest in Modeling, Consortium for Mathematics and Its Applications(COMAP)

PUBLICATIONS

Journal Articles

[J9] PDA: Privacy-preserving Data Aggregation for Information Collection, (accepted by ACM Transactions on Wireless Sensor Networks (ToSN)).

[J8] SMOCK: A Scalable Method of Cryptographic Key Management for Mission-critical Wireless Ad Hoc Networks.
Wenbo He, Ying Huang, Ravishankar Sathyam, Klara Nahrstedt and Whay C. Leey.
IEEE Transactions on Information Forensics and Security, Volume 4, Issue 1, pp 140-150, March 2009.

[J7] ORTEGA: An Efficient and Flexible Online Fault Tolerance Architecture for Real-Time Control Systems.
Xue Liu, Qixin Wang, Sathish Gopalakrishnan, **Wenbo He**, Lui Sha, Hui Ding, Kihwal Lee.
IEEE Transactions on Industrial Informatics (TII), Vol 4, No. 4, pp 213-224, 2008 (Best Paper Award of IEEE TII in 2008).

[J6] End-to-End Delay Control of Multimedia Applications over Multi-hop Wireless Links.
Wenbo He, Klara Nahrstedt, and Xue Liu.
ACM Transactions on Multimedia Computing, Communications and Applications (TOMCCAP) Volume 5, Issue 2, November 2008.

[J5] McCLS: Certificateless Signature Scheme for Emergency Mobile Wireless Cyber-Physical Systems
Zhong Xu, Guoqing Zhang, **Wenbo He**.
International Journal of Computers, Communications & Control (IJCCC), Vol. III, No. 4, pp.395-411, 2008.

[J4] A Scalable Public Key Management Scheme in Wireless Ad Hoc Networks (MobiCom'06 Poster Abstract).
Wenbo He, Ying Huang, Klara Nahrstedt, and Whay C. Lee.
ACM SIGMOBILE Mobile Computing and Communications Review, Volume 11, Issue 2, April 2007.

[J3] MobiHerald: Alert Propagation in Mobile Ad Hoc Networks (MobiCom'07 Poster Abstract).
Wenbo He, Ying Huang, Klara Nahrstedt, and Whay C. Lee.
ACM SIGMOBILE Mobile Computing and Communications Review, Volume 12, Issue 1, January 2008.

[J2] Optimal Real-Time Sampling Frequency Assignment for Wireless Sensor Networks.
Xue Liu, Qixin Wang, **Wenbo He**, Marco Caccamo, and Lui Sha.
*ACM Transactions on Sensor Networks (**ToSN**)*, Vol. 2(2), 2006.

[J1] Generalized Loop-back Recovery in Optical Mesh Networks.
Muriel Médard, Richard A. Barry, Steven G. Finn, **Wenbo He**, and Steven Lumetta.
*IEEE/ACM Transactions on Networking (**ToN**)*, Vol. 10(1), 2002.

Conference & Workshop Papers

[C34] Enhancing Privacy in Participatory Sensing Applications with Multidimensional Data.
Michael M. Groat, Benjamin Edwards, James Horey, **Wenbo He**, and Stephanie Forrest.
In Proceedings of the Tenth Annual IEEE International Conference on Pervasive Computing and Communications (PerCom '12), March 2012, In Press, Lugano, Switzerland (Acceptance ratio: 10.7% = 16/150).

[C33] Dynamic Control of Electricity Cost with Power Demand Smoothing and Peak Shaving for Distributed Internet Data Centers.
Jianguo Yao, Xue Liu, **Wenbo He**, and Ashikur Rahman.
In Proceedings of the 32nd International Conference on Distributed Computing Systems (ICDCS'12), Macau, China, June 2012 (Acceptance rate =13%).

[C32] Data Perturbation with State-Dependent Noise for Participatory Sensing.
Fan Zhang, Li He, **Wenbo He**, and Xue Liu.
In Proceedings of the 31st IEEE Conference on Computer Communications 2012 (INFOCOM'2012), Orlando, FL, 2012 (Acceptance rate =18%, 278 out of 1547).

[C31]HOSA: Holistic Scheduling and Analysis for Scalable Fault-tolerant FlexRay Design.
Yu Hua, Xue Liu, and **Wenbo He**.
In Proceedings of the 31st IEEE Conference on Computer Communications 2012 (INFOCOM'2012), Orlando, FL, 2012 (Acceptance rate =18%, 278 out of 1547).

[C30] Phoenix: Peer-to-Peer Location based Notification in Mobile Networks.
Yongping Xiong, **Wenbo He**, Canfeng Chen, Jian Ma, Limin Sun.
In Proceedings of the 8th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS'11), Valencia, Spain, October 2011.

[C29] End-to-End Delay Analysis in Wireless Network Coding: A Network Calculus-Based Approach.
Huanzhong Li, Xue Liu, **Wenbo He**, Jian Li, Wenhua Dou.
In Proceedings of the 31th International Conference on Distributed Computing Systems (ICDCS'11), Minneapolis, Minnesota, 2011, (Acceptance rate = 15.4%).

[C28] Defending Against Traffic Analysis in Wireless Networks through Traffic Reshaping.
Fan Zhang, **Wenbo He**, Xue Liu
In Proceedings of the 31th International Conference on Distributed Computing Systems (ICDCS'11), Minneapolis, Minnesota, 2011, (Acceptance rate = 15.4%).

[C27] Location Cheating: A Security Challenge to Location-based Social Network Services.
Wenbo He, Xue Liu, Mai Ren.
In Proceedings of the 31th International Conference on Distributed Computing Systems (ICDCS'11), Minneapolis, Minnesota, 2011 (Acceptance rate = 15.4%).

[C26] Inferring Users' Online Activities through Traffic Analysis.
Fan Zhang, **Wenbo He**, Xue Liu, Patrick Bridges.
In Proceedings of the Fourth ACM Conference on Wireless Network Security (WiSec'11) (Full Paper, acceptance rate = 11.5%, 10 full papers accepted out of 87), Hamburg, Germany , June 15-17, 2011 (**Best Paper Award**).

[C25] KIPDA: k-Indistinguishable Privacy-preserving Data Aggregation in Wireless Sensor Networks.
Michael Groat, **Wenbo He**, Stephanie Forrest.
In Proceedings of IEEE Conference on Computer Communications 2011 (INFOCOM'11), Shanghai, China. (Acceptance ratio =15.96%, 291 out of 1823).

[C24] Reliability Calculus: A Theoretical Framework To Analyze Communication Reliability.
Wenbo He, Xue Liu, Long Zheng, and Hao Yang. The 30th *International Conference on Distributed Computing Systems (ICDCS'10)* (acceptance Rate: 14%), Genoa Italy, June 21–25, 2010.

[C23] Anycast Routing in Mobile Opportunistic Networks.
Yongping Xiong, Limin Sun, **Wenbo He**, Jian Ma. The 15th IEEE Symposium on Computers and Communications (ISCC'10), Riccione, Italy, June 22-25, 2010.

[C22] Message Propagation in Ad-Hoc-Based Proximity Mobile Social Networks.
Wenbo He, Ying Huang, Klara Nahrstedt, Bo Wu. The 6th IEEE PerCom Workshop on Mobile Peer-to-Peer Computing (MP2P'10), Mannheim, Germany, April, 2010.

[C21] GreenCloud: A New Architecture for Green Data Center.
Liang Liu; Xue Liu; and **Wenbo He**. The 6th International Conference on Autonomic Computing and Communications, Barcelona, Spain, June 2009.

[C20] A Cluster-based Protocol To Enforce Integrity and Preserve Privacy in Data Aggregation.
Wenbo He, Xue Liu, Hoang Nguyen, and Klara Nahrstedt. The 2nd International Workshop on Cyber-Physical Systems (WCPS 2009), in conjunction with ICDCS 2009.

[C19] Challenges Towards Elastic Power Management in Internet Data Centers (invited).
Jie Liu, Feng Zhao, Xue Liu, and **Wenbo He**. The 2nd International Workshop on Cyber-Physical Systems (WCPS 2009), in conjunction with ICDCS 2009.

[C18] Energy-Aware Server Provisioning and Load Dispatching for Connection-Intensive Internet Services.
(**in alphabetic order**) Gong Chen, **Wenbo He**, Jie Liu, Suman Nath, Leonidas Rigas, Lin Xiao, and Feng Zhao.
to appear in *the 5th USENIX Symposium on Networked Systems Design and Implementation (NSDI'08)* (acceptance rate = 17%), San Francisco, CA, April, 2008. (This work has been reported on newscientist.com)

[C17] iPDA: An Integrity-Protecting Private Data Aggregation Scheme for Wireless Sensor Networks.
Wenbo He, Hoang Nguyen, Xue Liu, Klara Nahrstedt and Tarek Abdelzaher, in MILCOM 2008, in San Diego.

[C16] CORPS: Event-driven Mobility Model For First Responders In Incident Scene.
Ying Huang, **Wenbo He**, Klara Nahrstedt, Whay C. Lee, in MILCOM 2008 in San Diego.

[C15] DoS-Resistant Broadcast Authentication Protocol with Low End-to-end Delay.
Ying Huang, **Wenbo He**, Klara Nahrstedt, Whay C. Lee,
The 2nd IEEE Workshop on Mission-Critical Networking, in conjunction with IEEE INFOCOM 2008, (acceptance rate = 28%), Phoenix, Arizona.

[C14] A Certificateless Signature Scheme for Mobile Wireless Cyber-Physical.
Zhong Xu, Xue Liu, Guoqing Zhang, **Wenbo He**, Guanzhong Dai, Weihuan Shu, *The First International Workshop on Cyber-Physical Systems, in conjunction with ICDCS 2008*, (acceptance rate 27%), Beijing, China.

[C13] PDA: Privacy-preserving Data Aggregation in Wireless Sensor Networks.
Wenbo He, Xue Liu, Hoang Nguyen, Klara Nahrstedt, and Tarek Abdelzaher.
*Proceedings of the 26th Annual IEEE Conference on Computer Communications (**INFOCOM'07**)*, (acceptance rate = 18%), Anchorage, Alaska, May 2007.

[C12] SMOCK: A Self-contained Public Key Management Scheme for Mission-critical Wireless Ad Hoc Networks
Wenbo He, Ying Huang, Klara Nahrstedt, and Whay C. Lee.
*Fifth Annual IEEE International Conference on Pervasive Computing and Communications (**PerCom'07**)*, (acceptance rate = 9.6%), White Plains, New York, March 2007.

[C11] Active Queue Management Design Using Discrete-Event Control.
Xue Liu, **Wenbo He**.
*Proceedings of the 46th IEEE Conference on Decision and Control (**CDC'07**)*, New Orleans, LA, 2007.

[C10] MobileAds: Advertisement on Mobile Devices.
Wenbo He, Klara Nahrstedt.
Ph.D. Forum on Deeply Embedded Real-Time Computing, in The 28th IEEE Real-Time Systems Symposium (RTSS'07), Tucson, Arizona, December 2007.

[C9] Control Computing Systems as Queueing Systems: The Case of Optimal Dropping Strategy for Internet Routers.
Xue Liu, and **Wenbo He**.
*Second IEEE International Workshop on Feedback Control Implementation and Design in Computing Systems and Networks (**FeBID**), Co-located with IM 2007*, Munich, Germany, May 2007.

[C8] Requirements and System Architecture Design Consideration for First Responder Systems
Ying Huang, **Wenbo He**, Klara Nahrstedt, and Whay C. Lee.
IEEE Conference on Technologies for Homeland Security Conference, Waltham, MA, May 2007.

[C7] Experimental Validation of Middleware-based QoS Control in 802.11Wireless Networks (Invited paper).
Wenbo He, Hoang Nguyen, and Klara Nahrstedt.
*Third International Conference on Broadband Communications, Netwoks, and Systems (**BROADNETS '06**)*, San Jose, CA, October 2006.

[C6] Impact of Upper Layer Adaptation on End-to-end Delay Management in Wireless Ad Hoc Networks.
Wenbo He, and Klara Nahrstedt.
*Twelfth IEEE Real-Time and Embedded Technology and Applications Symposium (**RTAS '06**), San Jose, CA, May 2006.*

[C5] An Integrated Solution to Delay and Security Support in Wireless Networks.
Wenbo He, and Klara Nahrstedt.
*IEEE Wireless Communications and Networking Conference (**WCNC '06**), Las Vegas, NV, April 2006.*

[C4] A Feedback Control Scheme for Resource Allocation in Wireless Multi-hop Ad Hoc Networks.
Wenbo He, Xue Liu, and Klara Nahrstedt.
*International Conference on Mobile and Ubiquitous Systems: Networks and Services (**Mobiquitous'05**), San Diego, CA, July 2005.*

[C3] Building Robust Wireless LAN for Industrial Control with DSSS-CDMA Cellphone Network Paradigm.
Qixin Wang, Xue Liu, Weiqun Chen, **Wenbo He**, and Marco Caccamo.
*Proceedings of the IEEE Real-Time Systems Symposium (**RTSS '05**), Miami, Florida, December 2005.*

[C2] Autonomous Motion Planning on Mars.
Wenbo He, Chengdu Huang, Xue Liu, Liqian Luo, and Min Wu (in alphabetical order).
*Embedded Real-Time Systems Implementation Workshop (**ERTSI '05**), in conjunction with the 26th IEEE International Real-Time Systems Symposium (**RTSS '05**), December, 2005.*

[C1] Optimal QoS Sampling Frequency Assignment for Real-Time Wireless Sensor Networks.
Xue Liu, Qixin Wang, Lui Sha, and **Wenbo He**.
*Proceedings of IEEE Real-Time Systems Symposium (**RTSS '03**), Cancun, Mexico, December 2003.*

PATENTS

Motorola Patent *Nov., 2006*
Method and Apparatus for Alerting nodes of a Malicious Node in a Mobile Ad-Hoc Communication System — U.S. Patent pending, by Wenbo He, Ying Huang, Klara Nahrstedt, and Whay C. Lee.

Microsoft Patent *March, 2008*
A Framework for Joint Analysis And Design of Server Provisioning And Load Dispatching for Connection-intensive Services — U.S. Patent pending, by Gong Chen, Wenbo He, Jie Liu, Suman Nath, Leonidas Rigas, Lin Xiao, and Feng Zhao.

Microsoft Patent *March, 2008*
Load Skewing for Power-aware Server Provisioning — U.S. Patent pending, by Gong Chen, Wenbo He, Jie Liu, Suman Nath, Leonidas Rigas, Lin Xiao, and Feng Zhao.

PROFESSIONAL ACTIVITIES

Technical Program Committee for conferences and workshops including INFOCOM'12, PerCom'12, ICDCS'11, INFOCOM'11, PerCom'10, INFOCOM'10, IWQoS'09, WCPS'09, ICCCN'09, WiMD'09, ICESS'09, AdHoc-Nets'09, and RTCSA'09.

Reviewer for journals including IEEE Transactions on Wireless Communications (TWC), IEEE Transactions on Information Forensics and Security, IEEE Transactions on Computers (TC), ACM Transactions on Sensor Networks (ToSN), IEEE Transactions on Mobile Computing (TMC), ACM Transactions on Multimedia Computing, Communications and Applications (TOMCCAP), IEEE Transactions on Parallel and Distributed Systems (TPDS).

Membership IEEE member and member of IEEE Women in Engineering; ACM member.