

Minho Shin

Contact Information	Institute for Security, Technology, and Society 6211 Sudikoff Laboratory, Hanover, NH 03755 http://www.cs.dartmouth.edu/~mhshin	Phone: +1 (240) 381 0136 Fax: +1 (603) 646 0319 Email: mhshin@cs.dartmouth.edu
Research Interests	Wireless Networking: <ul style="list-style-type: none">• Wi-Fi, Ad-hoc, Wireless Mesh Networks, Vehicular Networks Pervasive Computing: <ul style="list-style-type: none">• People-centric Urban Sensing, Pervasive Health Monitoring Wireless Network Security: <ul style="list-style-type: none">• Authentication, Privacy, Data Integrity, Security Protocol Design	
Education	Ph.D., Computer Science University of Maryland, College Park, MD Advisor: William A. Arbaugh	2008
	M.S., Computer Science University of Maryland, College Park, MD Advisor: William A. Arbaugh	2003
	B.S., Computer Science and Statistics Seoul National University, Seoul, Korea	1998
Major Achievement	<ul style="list-style-type: none">• Significantly improved the performance and the security of WLAN hand-off with Neighbor Graphs (included in IEEE Standard 802.11f). Publications: CCR, Infocom, Mobisys, Proceedings of IEEE.• Addressed privacy and data integrity problems in people-centric sensing. Publications: Mobisys, SECON. Under submission: Infocom, SPIMACS• Improved the performance of multi-radio multi-channel ad-hoc networks. Publications: MASS, APPROX, Dial M-POMC.• Filed six U.S. patents and several foreign patents.	
Work Experience	Institution for Security, Technology, and Society at Dartmouth College Postdoctoral Research Fellow with Prof. David Kotz I worked on privacy and data integrity problems in people-centric sensing and pervasive health monitoring. I lead <i>Metrosec</i> project team of three Ph.D students and another post-doctor. I also lead <i>SenseMed</i> project mentoring a Master student.	Nov 2007–present
	Motorola Networks & Systems Lab, Schaumburg, IL Internship with Dr. Judy Fu I worked on the Spontaneous Inter-Provider Roaming project to design a general framework for spontaneous roaming between providers. With the proposed framework, users can access visiting networks without a prior roaming contract between the home- and visiting-networks. We filed two patents.	Jun–Aug 2006
	Motorola Networks & Systems Lab, Schaumburg, IL Internship with Dr. Madjid Nakhjiri I Implemented a prototype for broker-based inter-provider roaming scheme, which allows visiting users to authenticate through a broker service. I modified freeRadius server,	Jun–Aug 2005

open1x supplicant, and open1x authenticator.

Samsung Advanced Institute of Technology, Kiheung, Korea May–Jun 2003
Internship with Dr. Insun Lee and Dr. Kyunghoon Jang
I designed a QoS-aware hand-off technology using Neighbor Graphs. I co-worked with two Ph.D students and filed a patent.

Research Projects

Metrosec: Security of People-centric Sensor Networks Nov 2007–Present
This project aims to design secure and efficient people-centric sensing, which exploits mobile devices for environmental and human sensing. We developed a privacy-aware sensing architecture, ANONYSENSE, and an energy-efficient distributed sensing algorithm, DEAMON. We are developing a secure framework for sensor sharing between people.

SenseMed: Data Assurance in Pervasive Health Monitoring Nov 2007–2009
This project aimed to provide the assurance and assessment of data quality in pervasive health-monitoring systems. We developed a physiology-based patient authentication framework with machine learning algorithms. We proposed a confidence metric for health-monitoring sensor data. Publications are under preparation. Funded by Intel.

Thesis: Peer-to-Peer Lookup for Multi-Hop Wireless Networks 2006–2008
My thesis work presented a novel approach to building a scalable and efficient peer-to-peer lookup service in multi-hop wireless networks. I proposed a highly-structured lookup scheme, RIGS, and a loosely-structured lookup scheme, VALLEYWALK, both of which achieve near-shortest paths to the destination with reasonable assumptions.

Integrated Simulation Framework for Vehicular Ad-hoc Networks 2007–2008
Research on vehicular ad-hoc networks (VANET) needs a simulation method for evaluation. To present, no single simulator can simulate a VANET. We designed a VANET simulation framework by integrating two off-the-shelf simulators; *Paramics* for transportation simulation and *Qualnet* for network simulation.

Distributed Channel Assignment in Multi-hop Wireless Networks 2005–2007
Radio interference is a major obstacle for multi-hop wireless networks. Although the use of multiple radios can improve network throughput, it is difficult to assign an appropriate channel to each link. We proposed a distributed channel assignment algorithm SAFE and Semi-Definite Programming algorithms.

WLAN Hand-off and 3G-WLAN Interworking 2002–2004
This project aimed to design an efficient and secure method for hand-offs within a WLAN and between a 3G and a WLAN. We empirically identified the hand-off latency as a major obstacle for seamless hand-off. Then we proposed Neighbor Graphs (NG) to the reduced hand-off latency below 31 *ms*. We also proposed a proactive key distribution scheme (centralized) and a proactive context caching scheme (distributed) to avoid security-induced hand-off latency. Our solution was included in the IEEE Standard 802.11f. We extended the notion of NG for inter-network roaming. Funded by Samsung Corporation.

Journal Publications

Efficient and Scalable Peer-to-Peer Lookup in Multi-hop Wireless Networks
Minho Shin, William Arbaugh
Transactions on Internet and Information Systems, Vol.3, No.1, Feb. 2009 (SCIE)

Wireless Network Security and Interworking
Minho Shin, Arunesh Mishra, Justin Ma, and William Arbaugh
The Proceedings of IEEE on Cryptography and Security, Vol.94, No.2, pp 455–466, Feb. 2006

(SCI: impact factor 6.824)

An Empirical Analysis of the IEEE 802.11 MAC Layer Handoff Process

Arunesh Mishra, Minhó Shin, and William Arbaugh

ACM SIGCOM Computer Communication Review (CCR), Vol.33, No.2, pp 93–102, Apr. 2003

(SCI: impact factor 0.947)

**Conference/
Workshop
Publications**

Activity-aware ECG-based Patient Authentication for Remote Health Monitoring

Janani Sriram, Minhó Shin, Tanzeem Choudhury, David Kotz

To appear in *Proceedings of the Eleventh International Conference on Multimodal Interfaces and Workshop on Machine Learning for Multi-modal Interaction (ICMI-MLMI)*, November, 2009, MA, USA

MPCS: Mobile-Phone Based Patient Compliance System for Chronic Illness Care

Guanling Chen, Bo Yan, Minhó Shin, David Kotz, Ethan Berke

Proceedings of the First International Workshop on Ubiquitous Mobile Healthcare Applications, July, 2009, Toronto, Canada

DEAMON: Energy-efficient Sensor Monitoring

Minhó Shin, Patrick Tsang, David Kotz, Cory Cornelius

IEEE Communications Society Conference on Sensor, Mesh, and Ad Hoc Communications and Networks (SECON), June, 2009, Rome, Italy (acceptance ratio:18.8%)

Challenges in Data Quality Assurance in Pervasive Health Monitoring Systems

Janani Sriram, Minhó Shin, David Kotz, Anand Rajan, Manoj Sastry, Mark Yarvis

Conference "Future of Trust in Computing", June, 2008, Berlin, Germany

AnonySense: Privacy-Aware People-Centric Sensing

C. Cornelius, A. Kapadia, D. Kotz, D. Peebles, Minhó Shin, and N. Triandopoulos

The ACM International Conference on Mobile Systems, Applications, and Services (MOBISYS), June, 2008, Breckenridge, Colorado, USA (acceptance ratio:17.8%)

An Integrated Transportation and Communication Simulation Framework for Vehicular Ad Hoc Network Applications

Hyoungsoo Kim, Minhó Shin, Beomseok Nam, David Lovell

Transportation Research Board 2008 Annual Meeting, Washington D.C., USA.

SDP-based Approach for Channel Assignment in Multi-radio Wireless Networks

Hieu Dinh, Yoo-Ah Kim, Seungjoon Lee, Minhó Shin, Bing Wang

Dial M-POMC 2007, Portland, Oregon, USA. (acceptance ratio:35%)

Soft Edge Coloring

Chadi Kari, Yoo-Ah Kim, Seungjoon Lee, Alex Russell, and Minhó Shin

APPROX 2007, Princeton University, New Jersey.

AAA for Spontaneous Roaming Agreements In Heterogeneous Wireless Networks

Judy Fu, Minhó Shin, J. C. Strassner, N. Jain, V. Ram, S. Upadhyaya, and W. Arbaugh

Autonomic and Trusted Computing 2007, Hong Kong, China.

Distributed Channel Assignment for Multi-radio Wireless Networks

Minhó Shin, Seungjoon Lee, and Yooah Kim

The IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), Oct, 2006, Vancouver, Canada. (acceptance ratio:24.9%)

Improving the Latency of 802.11 Hand-offs using Neighbor Graphs

Minho Shin, Arunesh Mishra and William Arbaugh

The ACM International Conference on Mobile Systems, Applications, and Services (MOBISYS), June, 2004, Boston, MA. (acceptance ratio: 13.4%)

Pro-active Key Distribution using Neighbor Graphs

Arunesh Mishra, Minho Shin, N. L. Petroni, Jr., T. Charles Clancy, and William Arbaugh
IEEE Wireless Communications Magazine, Feb., 2004

Context Caching using Neighbor Graphs for Fast Handoffs in a Wireless Network

Arunesh Mishra, Minho Shin, and William Arbaugh

IEEE INFOCOM, March, 2003, Hong Kong, China, Mar., 2004 (acceptance ratio:20.8%)

The Robust Routing Protocol in Ad Hoc Networks

Seungjoon Lee, Bohyung Han, and Minho Shin

International Workshop on Ad Hoc Network(IWAHN) 2002, Vancouver, Canada.

Under Submission

SenseRight: High-integrity Medical Sensing for Remote Health Monitoring

Minho Shin, David Kotz, Apu Kapadia, Patrick Tsang, C. Cornelius, and D. Peebles
submitted to Security and Privacy in Medical and Home-Care Systems (SPIMACS), 2009

AnonyShare: Privacy-aware sensor sharing for people-centric sensing

Minho Shin, Cory Cornelius, Patrick Tsang, David Kotz, and Apu Kapadia
submitted to INFOCOM 2010

Technical Report

The Design of Efficient Internetwork Authentication for Ubiquitous Wireless Comm.

Minho Shin, Justin Ma, and William A. Arbaugh

Tech. Report of University of Maryland, 2004 (CS-TR-4617, UMIACS-TR-2004-59)

Posters

Reliable People-centric Sensing with Unreliable Participants

Minho Shin, C. Cornelius, D. Peebles, A. Kapadia, P. Tseng, and D. Kotz

The ACM International Conference on Mobile Systems, Applications, and Services (MOBISYS), June, 2008, Breckenridge, Colorado, USA

Patent

"Dynamic Roaming Agreement of Heterogeneous Networks" (US 11/773122, IN/1410/DEL/ 2007)

"Probing Method for Fast Handoff in WLAN" (US 7,400,604, KR 2004-90573)

"Method for fast roaming in a wireless network" (US 7,421,268)

"Mobility Management Method using an Improved Neighbor Graph" (US 7,450,546)

"Authentication method for wireless distributed system" (US 11/433679, KR 2006-41227, WO/2006/121307, EP 20060009984)

"Method for performing handoff in wireless network" (US Appl. 20050083887)

"Reconfiguration of Neighborhood Graph for QoS Support in Heterogeneous Network, and its use for seamless handoff" (KR 2003)

Talks

Distributed Channel Assignment for Multi-radio Wireless Networks

Minho Shin, Seungjoon Lee, and Yooah Kim

MASS 2006, Vancouver, Canada.

Improving the Latency of 802.11 Hand-offs using Neighbor Graphs

Minho Shin, Arunesh Mishra and William Arbaugh

ACM MOBISYS 2004, Boston, MA.

Context Caching using Neighbor Graphs for Fast Handoffs in a Wireless Network
Arunesh Mishra, Minh Shin, and William Arbaugh
IEEE INFOCOM 2003, Hong Kong, China, Mar., 2004

Teaching Experience	Teacher Training Program Dartmouth Center for the Advancement of Learning	May 2008
	Teaching Assistant Department of Computer Science, University of Maryland, College Park, MD • Discrete Mathematics, Data Structure, Introduction to Computer Science	2001–2002
	Office Program Instructor The Headquarter of the 2nd Fleet, Republic of Korea Navy	1993–1994
Skills	Languages : C, C++, Object C, Java, Ruby, PHP, SQL, Object Pascal System and Network Programming : TCP/IP Socket, Linux/BSD Kernel Simulation Tools : Matlab, ns-2, Qualnet, Paramics	
Awards & Honors	National IT Fellowship Ministry of Information and Communication of Korea	Feb 2001–Jan 2005
	SNUA Student Scholarship Seoul National University Alumni Association	2004–2007
Social Activities	President of Korean Graduate Student Association of CS in UMD	2003
	Founder and president of KGSYS (KGCS System Research Group) in UMD	2002
Professional Services	Program Committee: IEEE LCN Workshop on Network Security (WNS) 2008 Active Reviewer: IEEE Transactions on Mobile Computing, IEEE Transactions on Networking, IEEE ICC, IEEE Globecom, IEEE HPSR, IEEE Sarnoff, IEEE WCNC, IEEE ICCN, IEEE PIMRC, IEEE Communications Magazine, ACM IWCMC, European Wireless, European Transactions on Telecommunications	
References	William A. Arbaugh Professor, Department of Computer Science University of Maryland, College Park, MD 20742, USA President of Komoku, Inc waa@komoku.com, (443) 283-7641	
	David Kotz Professor, Department of Computer Science Dartmouth College, Hanover, NH 03755, USA dfk@cs.dartmouth.edu, (603) 646-1439	
	David Lovell Professor, Dept. of Civil and Environmental Engineering University of Maryland, College Park, MD 20742, USA lovell@eng.umd.edu, (301) 405-7995	
	Judy Fu Networks and Systems Lab Motorola Labs, IL 60196, USA judy.fu@motorola.com, (847) 576-6656	
Citizenship & Status	Korean (Republic of Korea) F-1 Student Visa (OPT)	