Min Suk Kang

Contact Information	4720 Forbes Avenue 2224C Pittsburgh, PA 15213	412-915-9336 minsukkang@cmu.edu http://users.ece.cmu.edu/~minsukk/

Research Interests Network and distributed system security; wireless network security and privacy; Internet privacy and surveillance.

Education

Carnegie Mellon University, Pittsburgh, PA

Ph.D., Electrical and Computer Engineering, 08/2011 – 2016 (expected)

- Dissertation: *Handling Large-Scale Denial-of-Service Attacks Targeting Internet Infrastructure*
- Advisor: Virgil D. Gligor
- Thesis Committee: Adrian Perrig, Vyas Sekar, and Peter Steenkiste

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

M.S. in Electrical Engineering and Computer Science, 03/2006 – 02/2008

- Master Thesis: *A pre-whitening scheme in a MIMO-based spectrum-sharing environment*
- Advisor: Dan Keun Sung

University of Colorado Boulder, Boulder, Colorado

Exchange Student in Software Engineering, 09/2003 – 02/2004

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

B.S. in Electrical Engineering and Computer Science, 03/2002 – 02/2006

Employment

Verisign Labs, Reston, VA

Research intern, 06/2015 – 08/2015

- Project: *Evaluation of Privacy for DNS Private Exchange*
- Worked with Allison Mankin and Aziz Mohaisen

Carnegie Mellon University, Pittsburgh, PA

Research assistant, 02/2012 –

- Working with professor Virgil D. Gligor

KAIST Institute, Daejeon, South Korea

Research engineer (as part of Korean military duty), 03/2008 – 05/2011

Sun Microsystems, Bloomfield, CO

Intern (software programmer), 01/2003 – 02/2003

Awards and Honors

- Carnegie Institute of Technology Dean's Scholarship 09/2011 – 08/2012
- Korean Government Study-Abroad Scholarship Program 09/2011 – 08/2013
- KAIST Full Scholarship for Graduate Program 03/2006 – 02/2008
- Exchange Student Grants from Korean Government 08/2003 – 02/2004
- LG Global Challenger, Travel Grant Award & Bronze Best Report Award 08/2003 – 08/2003
- KAIST Full Scholarship for Undergraduate Program 03/2002 – 02/2006

Refereed Publications

Conference Publications

[1] **Min Suk Kang**, Virgil D. Gligor, and Vyas Sekar. "Evolving DDoS Attacks and Defenses." In *Proceedings of Security Protocols Workshop* **(SPW)** *(To Appear)*, April 2016.

[2] **Min Suk Kang**, Virgil D. Gligor, and Vyas Sekar. "SPIFFY: Inducing Cost-Detectability Tradeoffs in Persistent Link-Flooding Attacks." In *Proceedings of Network and Distributed System Security Symposium* **(NDSS)**, February 2016.

[3] **Min Suk Kang** and Virgil D. Gligor. "Routing Bottlenecks in the Internet: Causes, Exploits, and Countermeasures." In *Proceedings of ACM Conference on Computer and Communications Security* **(CCS)**, November 2014.

[4] Soo Bum Lee, **Min Suk Kang**, and Virgil D. Gligor. "CoDef: Collaborative Defense Against Large-Scale Link-Flooding Attacks." In *Proceedings of ACM Conference on emerging Networking EXperiments and Technologies* **(CoNEXT)**, December 2013.

[5] **Min Suk Kang**, Soo Bum Lee, and Virgil D. Gligor. "The Crossfire Attack." In *Proceedings of IEEE Symposium on Security and Privacy* **(IEEE S&P)**, May 2013.

[6] Shrikant Adhikarla, **Min Suk Kang**, and Patrick Tague. "Selfish Manipulation of Cooperative Cellular Communications via Channel Fabrication." In *Proceedings of ACM Conference on Security and Privacy in Wireless and Mobile Networks* **(WiSec)**, April 2013.

[7] Donghan Chee, **Min Suk Kang** and Howon Lee, Bang Chul Jung. "A study on the green cellular network with femtocells." In *Proceedings of IEEE Ubiquitous and Future Networks (ICUFN)*, June 2011

[8] **Min Suk Kang** and Bang Chul Jung. "A Cognitive p-Persistent CSMA Scheme for Spectrum Sharing Based Cognitive Radio Networks." In *Proceedings of IEEE Wireless Communications and Networking Conference* **(WCNC)**, April 2010.

[9] **Min Suk Kang** and Bang Chul Jung. "Decentralized Intercell Interference Coordination in Uplink Cellular Networks using Adaptive Sub-band Exclusion." In *Proceedings of IEEE Wireless Communications and Networking Conference* **(WCNC)**, April 2009.

[10] **Min Suk Kang**, Bang Chul Jung, and Dan Keun Sung. "Performance Analysis of Four Different Downlink Data Relaying Schemes in Cellular Systems." In *Proceedings of IEEE International Symposium of Communication and Information Technology (ISCIT)*, 2007.

[11] **Min Suk Kang**, Jo Woon Chong, Hyesun Hyun, Su Min Kim, Byoung Hoon Jung, and Dan Keun Sung. "Adaptive Interference-Aware Multi-Channel Clustering Algorithm in a ZigBee Network in the Presence of WLAN Interference." In *Proceedings of IEEE International Symposium of Wireless Pervasive Computing (ISWPC)*, 2007.

[12] Su Min Kim, Jo Woon Chong, Byoung Hoon Jung, **Min Suk Kang**, and Dan Keun Sung. "Energy-Aware Communication Module Selection through ZigBee Paging for Ubiquitous Wearable Computers with Multiple Radio Interfaces." In *Proceedings of IEEE International Symposium of Wireless Pervasive Computing (ISWPC)*, 2007.

[13] Byoung Hoon Jung, Jo Woon Chong, Su Min Kim, **Min Suk Kang**, and Dan Keun Sung. "Ubiquitous Wearable Computer (UWC)-Aided Coexistence Algorithm in an Overlaid Network Environment of WLAN and Zigbee Networks." In *Proceedings of IEEE International Symposium of Wireless Pervasive Computing (ISWPC)*, 2007.

Journal Publications

[14] **Min Suk Kang**, Bang Chul Jung, Kyuho Son, Yung Yi and Song Chong. "Self-Organizing Networks for Next-Generation Wireless Communications." *SK Telecom Review* - Invited Paper, Vol. 19, No. 4, Sept. 2009.

[15] **Min Suk Kang**, Bang Chul Jung, Dan Keun Sung, and Wan Choi. "A Pre-whitening Scheme in a MIMO-Based Spectrum-Sharing Environment." *IEEE Communications Letters*, Vol. 12, No. 11, pp. 831-833, Nov. 2008.

[16] **Min Suk Kang**, Bang Chul Jung, and Dan Keun Sung. "Effect of Cooperative and Selection Relaying Schemes on Multiuser Diversity in Downlink Cellular Systems with Relays." *Journal of Communications and Networks*, Vol. 10, No. 2, June 2008.

Patents

[1] Chan Ho Min, Young Hyun Jeon, Jong Hyung Kwun, Hyu Dae Kim, Min Suk Kang, and Dong Won Lee, "Method for changing a preamble in moving network system, and system for same," US 8750787 B2 (WO 2010074491 A3), June 10, 2014

[2] Tae Soo Kwon, Woo Geun Ahn, Dong Ho Cho, and Min Suk Kang, "Communication method of a vehicular mobile terminal, a macro base station, a neighbor micro base station, and a serving micro base station in a multi-cell group," US 8792452 B2, Jul 29, 2014

[3] Young Hyun Jeon, Tak Ki YU, Jong Hyung Kwun, Chan Ho Min, Min Suk Kang, Hyu Dae Kim, Bang Chul Jung, and Dong Won Lee, "Data transfer method, data transmission apparatus, and communication system in multi-hop relay system," US 8897698 B2 (WO 2010064867 A3), Nov 25, 2014

[4] Dan Keun Sung, Su Min Kim, Jo Woon Chong, Byoung Hoon Jung, Min Suk Kang, Chang Yong Jung, "Multiple Module Communication Apparatus and Method of Transmitting and Receiving Data Using the Apparatus," 10-0840564, Korea, Jun. 17, 2008

[5] Dan Keun Sung, Min Suk Kang, Jo Woon Chong, Byoung Hoon Jung, Su Min. Kim, Chang Yong Jung, "Method of Avoiding Interference for Zigbee Network and Zigbee Communication Apparatus Applied Thereto," 10-0767332, Korea, Oct. 9, 2007

Talks

- Denial-of-service attacks on the Internet infrastructure,
  Verisign Lab's Huddle Talk, Reston, VA 2015
- Routing Bottlenecks in the Internet: Causes, Exploits, and Countermeasures,
  ACM CCS, Scottsdale, AZ 2014
- New massive DDoS attacks and potential defenses,
  KAIST Seminar, Daejon, Korea 2014
- Research trends in network security,
  Samsung Electronics, Suwon, Korea 2014
- New massive DDoS attacks and potential defenses,
  Yonsei University Seminar, Seoul, Korea 2014
- New massive DDoS attacks and potential defenses,
  Korea University Seminar, Seoul, Korea 2014
- Next Generation DDoS Attacks,
  Pittsburgh Chapter of ISSA 2014 Information Security Forum 2014
- CoDef: collaborative defense against large-scale link-flooding attacks,
  CoNEXT, Santa Barbara, CA 2013
- The Crossfire Attack,
  IEEE S&P, San Francisco, CA 2013

Student Advising

Master Student

Shrikant Adhikarla, 09/2012 – 04/2013

- Project description: Developing novel resource-depletion attacks against the current cellular systems [6]

Undergraduate Students

Taeho Jeon, Sunwoo Kong, and Sungjin Kim, 12/2006 – 02/2007

- Project description: Building indoor localization systems utilizing the sensor network testbed with 40 ZigBee nodes [11]
- The team won the best individual research award

Teaching

Teaching Assistant 2015

- Introduction to Computer Security
- *Carnegie Mellon University, Pittsburgh, PA*
- Working with professor Lujo Bauer

Teaching Assistant 2014

- Introduction to Computer Security
- *Carnegie Mellon University, Pittsburgh, PA*
- Worked with professor Virgil D. Gligor

Guest Lecturer 2013

- Introduction to Computer Security
- Two lectures on access control and one lecture on denial-of-service
- *Carnegie Mellon University, Pittsburgh, PA*

Teaching Assistant 2007

- Telecommunication Networks
- *KAIST, Daejon, Korea*
- Worked with professor Dan Keun Sung

Professional Service

External Reviewer

- 2 papers in IEEE Euro S&P 2015
- 2 papers in IEEE ICDCS 2015
- 2 papers in IEEE S&P 2014
- 1 paper in IEEE Globecom SAC Social Networks 2014
- 2 papers in USENIX Security 2014
- 1 paper in ACM ASIACCS 2013

References

Virgil D. Gligor
Professor
ECE and CyLab
Carnegie Mellon University
Phone: 412-268-9833
E-mail: gligor@cmu.edu

Vyas Sekar
Assistant Professor
ECE and CyLab
Carnegie Mellon University
Phone: 412-268-2853
E-mail: vsekar@andrew.cmu.edu

Dan Keun Sung
Professor
Department of Electrical Engineering
KAIST
Phone: +82-42-350-3439
E-mail: dksung@ee.kaist.ac.kr

Soo Bum Lee
Systems Security Architect
Qualcomm
Phone: 858-845-5463
E-mail: soobuml@qti.qualcomm.com