Baik Hoh

Contact Information	Mobile Internet Systems and Services Nokia Research Center 955 Page Mill Rd. Palo Alto, CA 94304	*Cell:* (650) 704-3261 http://research.nokia.com baik.hoh@nokia.com http://research.nokia.com/people/baik_hoh/index.html

Job Duties Software engineering for mobile Internet services and systems.

Research Interests Building secure and privacy-preserving systems that achieve both the strong anonymity and the security with the balanced service quality in pervasive computing areas

Education

Rutgers University, New Brunswick/Piscataway, NJ USA

Ph.D. in Electrical and Computer Engineering (graduation date: October, 2008)

- Thesis: Achieving Guaranteed Anonymity In Time-Series Location Data
- Research Groups: Mobile Computing (Security and Privacy) in WINLAB
- GPA and Credits: 3.875/4.0 (79 Credits)
- Advisor: Dr. Marco Gruteser

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

M.S. Electrical and Computer Engineering, Feb. 2001

- Research Area: Communication Systems
- Master Thesis: An Improved Adaptive MMSE (Minimum Mean Square Error) Receiver for DS/CDMA Systems in Frequency-Selective Fading Channel (Advisor: Prof. Yonghoon Lee)

B.S. Electrical and Computer Engineering, Feb. 1999

Experience

Nokia Research Center, Palo Alto, USA

Member of Research Staff **Nov, 2008 - Current**

- **Team:** Mobile Internet Services and Systems (Team Leader: Dr. Quinn Jacobson)
- **Job description:** Developing a concept of *Virtual Trip Lines* and building a community-enhanced automotive traffic monitoring system based on it.

Nokia Research Center, Palo Alto, USA

Research Intern **May, 2007 - January, 2008**

- **Team:** Mobile Internet Services and Systems (Team Leader: Dr. Quinn Jacobson)
- **Job description:** Building a software-platform which simultaneously provisions security and privacy of Location-based services in cellular networks

WINLAB/Rutgers Univ., New Jersey, USA

Research Assistant **August, 2005 - August, 2008**

- **NSF CyberTrust Project.** Designing Multi-Layer Anonymity Techniques for Time-Series Location Information in Wireless Systems. (Finished)
- **WINLAB-General Motors Project.** Ensuring Security and Privacy in GPS-Based Traffic Monitoring Systems. (Finished)

TURBOTEK Co., Ltd., Bundang, South Korea

Researcher **March, 2001 - July, 2003**

- **Major Products:** Developed three commercial models of CDMA2000 1X mobile handsets in South Korea and China market
- **Roles:** (1) Developing Window-based Automation Tool for mass production lines (MFC Programming) *and* (2) Developing Device Drivers in mobile handsets (e.g., Flash Memory, Yamaha MP3 LSI, USB, and RS232)

INTEGRANT Technologies Inc., Bundang, South Korea

Exchange researcher **Aug. - Oct., 2001**

- **Major Product:** Participated in design of RF circuits for CDMA 1X mobile handset
- **Roles:** Developing RF auto-calibration tool for mass production lines (using GPIB/RS232 connections between PC, Moible Handset, and Agilent E8285A Mobile Station Test Equipment)

KAIST, Daejeon, South Korea

Research Assistant / Teaching Assistant **March, 1999 - February, 2001**

- **Digital Communication Simulator Development Project.** Developed digital communication and signal processing libraries), funded by Ministry of Information and Communication, Republic of Korea.
- Teaching Courses: EE525 Networking Technology and Applications (Graduate Course), EE306 Electronics Lab II (Undergraduate course)

Honors and Awards

Awarded **Tranny Award (ITS Program of the year 2008)** by California Transportation Foundation, June 2009

Awarded **Academic Excellence Award** by ECE dept. of Rutgers University, May 2009

Awarded **Exemplary Team Achievement** by Nokia Research Center, Q1 2008

Awarded **Best Intern Prize** by Nokia Research Center Palo Alto, 2007

Awarded **NSF Student Travel Grant (about USD 2,000)** for Securecomm 2005 conference, Jul 2005

Awarded **Scholarship from Ministry of Information and Communication**, Republic of Korea (USD 60,000 for 2 yrs), Jul 2003

Third Runner-up, Micro Robot Soccer Tournament, Sep 1998

Publications

Journals, Conferences, and Workshops

(Under review) **Baik Hoh**, Marco Gruteser, Hui Xiong, and Ansaf Alrabady. *Preserving Privacy in GPS Traces via Density-Aware Path Cloaking (Journal version).*

26 Authors including **Baik Hoh**. *Mobile Century - Using GPS Mobile Phones as Traffic Sensors: A Field Experiment.*, ITS World Congress 2008.

Baik Hoh, Marco Gruteser, Ryan Herring, Jeff Ban, Dan Work, Juan-Carlos Herrera, Alexandre Bayen, Murali Annavaram, and Quinn Jacobson. *Virtual Trip Lines for Distributed Privacy-Preserving Traffic Monitoring*, ACM MobiSys 2008.

Baik Hoh, Marco Gruteser, Hui Xiong, and Ansaf Alrabady. *Preserving Privacy in GPS Traces via Density-Aware Path Cloaking.*, ACM Conference on Computer and Communications Security

(CCS), 2007.

Baik Hoh, Marco Gruteser, Hui Xiong, and Ansaf Alrabady. *Enhancing Security and Privacy in Traffic-Monitoring Systems*, IEEE Pervasive Computing Magazine (Oct/Dec Issue), 2006.

Baik Hoh, Marco Gruteser, Hui Xiong, and Ansaf Alrabady. *Enhancing Privacy Preservation of Anonymous Location Sampling Techniques in Traffic Monitoring Systems (Short paper)*, IEEE/CreateNet SecureComm 2006., Baltimore, Maryland, Sept. 2006.

Baik Hoh and Marco Gruteser. *Computer Ecology: Responding to Mobile Worms with Location-Based Quarantine Boundaries*, International Workshop on Research Challenges in Security and Privacy for Mobile and Wireless Networks (WSPWN 2006), Miami, USA, Mar. 2006.

Baik Hoh and Marco Gruteser. *Protecting Location Privacy Through Path Confusion*, IEEE/CreateNet SecureComm 2005., Athens, Greece, Sept. 2005.

Marco Gruteser and **Baik Hoh**. *On the Anonymity of Periodic Location Samples*, 2nd International Conference on Security in Pervasive Computing, Boppard, Germany, April, 2005.

Book Chapters

Baik Hoh and Marco Gruteser. *Computer Ecology: Responding to Mobile Worms with Location-Based Quarantine Boundaries*, book chapter (Springer Science+Business Media), 2006.

Marco Gruteser and **Baik Hoh**. *Privacy Preservation of GPS Traces.*, In Encyclopedia of GIS. Shashi Shekhar, Hui Xiong (Eds.) Springer Reference.

Thesis

Baik Hoh, *Achieving Guaranteed Anonymity In Time-Series Location Data*, Oct 2008, Advised by Prof. Marco Gruteser

Baik Hoh, *An Improved Adaptive MMSE (Minimum Mean Square Error) Receiver for DS/CDMA Systems in Frequency-Selective Fading Channel*, Feb 2001, Advised by Prof. Yonghoon Lee

Patents

METHODS, APPARATUSES, AND COMPUTER PROGRAM PRODUCTS FOR TRAFFIC DATA AGGREGATION USING VIRTUAL TRIP LINES AND A COMBINATION OF LOCATION AND TIME BASED MEASUREMENT TRIGGERS IN GPS-ENABLED MOBILE HANDSETS (approved in 2008)

News and Articles

My *internship at Nokia Research* and my *PhD. dissertation* are published in *ECE Dept. Newsletter in Rutgers (http://www.ece.rutgers.edu/ECE-News-Fall08-Final.pdf)* and in Nokia Research Center newsletter (http://research.nokia.com/files/OT_1_09.pdf)

Unpublished Articles

Pandurang Kamat, **Baik Hoh**, Marco Gruteser, and Wade Trappe. *Privacy in Vehicular Ad Hoc Networks*, 2007.

Sangho Oh, S. Kaul, **Baik Hoh**, and Marco Gruteser. *Flying under the "RADAR": Location Privacy for Mobile Devices through Cooperation.*

Recent Invited Talks

Baik Hoh and Marco Gruteser. *Virtual Trip Lines for Distributed Privacy-Preserving Traffic Monitoring*, 3rd Rutgers-Helsinki PhD Student Workshop, May 2008

Baik Hoh and Marco Gruteser. *Privacy of Anonymous Location Sampling Techniques: A Traffic Monitoring Case Study*, 1st Rutgers-Helsinki PhD student Workshop, May 2006.

Baik Hoh. *Mobile Worms: Computer Ecology, Responding to Mobile Worms with Location-Based Quarantine Boundaries*. KSEA-NJ Technical Symposium, Nov, 2005.

Baik Hoh and Marco Gruteser. *How To Preserve Location Privacy in Location-Based Applications*. The 15th KSEA Northeast Regional Conference (NRC2005), May, 2005.

Professional Skills

- Mobile programming: iPhone SDK, Android, and J2ME
- Operating Systems: Windows, Real-time OS (REX) and basic UNIX/LINUX
- Programming Languages: C, C++, Objective-C, Phython, and Java SE/EE
- Simulation Tools: Matlab, NS2, OPNET and SPW/COSSAP
- Traffic Vehicle Simulator: handling and programming of PARAMICS
- Hardware Manipulation: Network Analyzer, Spectrum Analyzer, and CDMA/PCS related Test Equipments (HP/Agilent)

Activities

- Memberships: IEEE, ACM, Computer Society
- Rutgers Korean Graduate Student Association (RKGSA), Vice President (2004-2005)
- Korean Scientist and Engineer Association (KSEA), Rutgers Local Manager (2005-Current)
- Vice president of MicroRobot Club (MIRAGE), KAIST (1997-1999)

References

Prof. Marco Gruteser. WINLAB/Rutgers University. gruteser@winlab.rutgers.edu

Prof. Dipankar Raychaudhuri. WINLAB/Rutgers University. ray@winlab.rutgers.edu

Prof. Wade Trappe. WINLAB/Rutgers University. trappe@winlab.rutgers.edu

Prof. Hui Xiong. MSIS Dept./Rutgers University. hui@rbs.rutgers.edu

Dr. Quinn Jacobson. Nokia Research Center. quinn.jacobson@nokia.com

Prof. Yong Hoon Lee. Korea Advanced Institute of Science and Technology. yohlee@ee.kaist.ac.kr

Dr. Ansaf Alrabady. General Motors R&D. ansaf.alrabady@gm.com