

HAKSOO CHOI

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SUMMARY

- Broad range of software research and development experience ranging from small-embedded to big-cloud systems, with deep understanding of underlying hardware, operating systems, and programming languages.
- Strong algorithmic and analytical thinking skills, with deep understanding of computer science.
- An excellent problem solver, able to quickly understand complex problem space and figure out effective solutions and opportunities for improvements.
- An effective team player, skilled in discussing ideas, communicating effectively, and cooperating with team members towards project and organizational goals.

EDUCATION

University of California, Los Angeles

Ph.D., Computer Science (GPA: 3.97/4.0)

2009–2014

Thesis: Styles and the Design of Mobile-Cloud Sensing Software Architectures

Yonsei University, Seoul, Korea

M.Sc., Computer Science (GPA: 4.27/4.3)

2007–2009

Thesis: Application-Specific Platform Builder for Deeply Embedded OS

University of California, Davis

Exchange Student, Computer Science (GPA: 3.86/4.0, Major GPA: 3.91/4.0)

2006

Yonsei University, Seoul, Korea

B.Sc., Computer Science (GPA: 3.96/4.3, Major GPA: 4.3/4.3)

2000–2007

EXPERIENCE

University of California, Los Angeles

LOS ANGELES, CA

Graduate Student Researcher, Networked Embedded Systems Lab.

2009–2014

- Architected and developed a distributed VM-based mobile-cloud system for privacy-aware sharing of personal sensor data.
- Developed algorithms and software for energy-efficient execution of machine-learning data-flows on heterogeneous multiple processor cores.
- Used Android native/app, Jersey, Restlet, Django, Informix DB Timeseries, MongoDB, MATLAB

Qualcomm

SAN DIEGO, CA

Intern, Corporate Research and Development

06-09/2013, 06-09/2012

- Designed a machine learning algorithm for inferring smartphone user's motion status using cell tower information. Project outcome became a part of U.S. Patent Application.

- Developed an Android NDK communication layer for Linux Wi-Fi WPS service and Android App for facilitating Wi-Fi device association using QRCode. Project outcome demonstrated at CES 2013.
- Used Android native/app, MATLAB

IBM T.J. Watson Research Center

HAWTHORNE, NY

Intern, IT / Wireless Convergence Department

01-04/2012

- Designed a machine-learning algorithm for predicting ad-hoc Wi-Fi connectivity in vehicular network. A part of software developed used in IBM production systems.
- Used QualNet, Weka.

Yonsei University

SEOUL, KOREA

Graduate Student Researcher, Mobile Embedded System Lab.

2005, 2007–2009

- Designed a device driver framework and an application-specific kernel builder for a multi-threaded microcontroller operating system.
- Designed modifications of the SNMP protocol for low-power embedded IPv6 (6LoWPAN) networks.
- Designed IEEE 802.15.4-based MAC layer protocol for reliable/efficient transfer of large sensor data on low-rate wireless channel.
- Developed a strain-gauge sensor network system for structural health monitoring.
- Used GNU Tools, firmware, embedded OS, TinyOS, MSP430, ATmega128

Samsung Electronics

SEOUL, KOREA

Samsung S/W Membership, Robotic and Embedded Systems Lab.

2005, 2007–2009

- Developed a home networking module in intelligent modular service robot project.
- Designed TCP/IP communication architecture for multiple modules of the robot.
- Used embedded Linux, TCP/IP sockets, various sensors/actuators, TinyOS.

Korea Electronics Technology Institute

SEOUL, KOREA

Intern, Intelligent IT System Research Center.

2007–2008

- Developed a surveillance human tracking system based on wireless passive infrared sensor networks.
- Designed mathematical abstraction of multiple indoor infrared sensors and algorithms for tracking human location.
- Used TinyOS, Windows MFC.

University of California, Davis

DAVIS, CA

Intern, Department of Biological and Agricultural Engineering

06-10/2006

- Developed an embedded software for localization of a harvesting truck.
- Designed algorithms for tracking a harvesting truck inside large tree field using various non-GPS sensors.

- Used embedded RTOS. Rabbit MCU, Dynamic C

PATENTS

Shankar Sadasivam, Haksoo Choi, Jin Won Lee, “*Motion Classification Using a Combination of Low-Power Sensor Data and Modem Information*,” Qualcomm Technologies Inc., U.S. Patent Application #14/479,167, 2014.

Sukwon Choi, Haksoo Choi, Sungchil Cho, Hojung Cha, “*Structural Health Monitoring System*,” Yonsei University, Hybus Co. Ltd., Korea Patent #10-0947042, 2010.

Hojung Cha, Haksoo Choi, Sukwon Choi, “*Structural Health Monitoring Method*,” Yonsei University, Korea Patent #10-0925801, 2009.

PUBLICATIONS

Conferences

Chenguang Shen, Haksoo Choi, Supriyo Chakraborty, Mani Srivastava, “*Towards a Rich Sensing Stack for IoT Devices*,” The 33rd IEEE/ACM International Conference on Computer-Aided Design (ICCAD), Special Session, November 2014.

Chenguang Shen, Supriyo Chakraborty, Kasturi Rangan Raghavan, Haksoo Choi, Mani B Srivastava, “*Exploiting Processor Heterogeneity for Energy Efficient Context Inference On Mobile Phones*,” The 5th USENIX Workshop on Power-Aware Computing and Systems (HotPower), November 2013.

Pandarasamy Arjunan, Nipun Batra, Haksoo Choi, Amarjeet Singh, Mani B Srivastava, “*SensorAct: A Privacy and Security Aware Federated Middleware for Building Management*,” The 4th ACM Workshop On Embedded Systems for Energy-Efficiency In Buildings (BuildSys), November 2012.

Haksoo Choi, Raghu Ganti, Mudhakar Srivatsa, Ramya Raghavendra, “*Content Dissemination Protocols in Hybrid Wireless Networks*,” The Annual Conference of U.S. Army Information Technology Agency (ACITA), September 2012.

Haksoo Choi, Supriyo Chakraborty, Mani B Srivastava, “*Design and Evaluation of SensorSafe: a Framework for Achieving Behavioral Privacy in Sharing Personal Sensory Information*,” The 2nd IEEE International Symposium on Security and Privacy in Internet of Things (TrustCom-SPIoT), June 2012.

Haksoo Choi, Supriyo Chakraborty, Zainul M Charbiwala, Mani B Srivastava, “*SensorSafe: a Framework for Privacy-Preserving Management of Personal Sensory Information*,” The 8th VLDB Workshop on Secure Data Management (VLDB-SDM), June 2011.

Supriyo Chakraborty, Haksoo Choi, Mani B Srivastava, “*Demystifying Privacy In Sensory Data: A QoI based approach*,” The 3rd IEEE International Workshop on Information Quality and Quality of Service for Pervasive Computing (PerCom-IQ2S), March 2011.

Haksoo Choi, Nakyoung Kim, Hojung Cha, “*6LoWPAN-SNMP: Simple Network Management Protocol for 6LoWPAN*,” The 11th IEEE International Conference on High Performance Computing and Communications (HPCC), June 2009.

Haksoo Choi, Sukwon Choi, Hojung Cha, “*Structural Health Monitoring System based on Strain Gauge Enabled Wireless Sensor Nodes*,” The 5th IEEE International Conference on Networked Sensing Systems (INSS), June 2008.

Haksoo Choi, Chanmin Yoon, Hojung Cha, “*Device Driver Abstraction for Multithreaded Sensor Network Operating Systems*,” The 5th European Conference on Wireless Sensor Networks (EWSN), February 2008.

Haksoo Choi, Byunghun Song, Hyung Su Lee, “*Surveillance Tracking System Using Passive Infrared Motion Sensors in Wireless Sensor Networks*,” The 22nd IEEE International Conference on Information Networking (ICOIN), January 2008.

Ho Seok Ahn, In-Kyu Sa, Young Min Beak, Kwang Hee Lee, Haksoo Choi, Joong Kil Shin, Kyu Chul Kyung, Minhyuck Kim, Byung Soo Lim, Jin Young Choi, “*Modular System Architecture of Intelligent Service Robots Focused on Smart Adapted Services*,” The 10th IEEE International Conference on Advanced Robotics (ICAR), August 2007.

Journals

Supriyo Chakraborty, Zainul M Charbiwala, Haksoo Choi, Kasturi Rangan Raghavan, Mani B Srivastava, “*Balancing Behavioral Privacy and Information Utility in Sensory Data Flows*,” The Journal of Pervasive and Mobile Computing, Elsevier, June 2012.

Uriel. A. Rosa, Todd S. Rosenstock, Haksoo Choi, David Pursell, Christopher J. Gliever, Patrick H. Brown, Shrini K. Upadhyaya, “*Design and Evaluation of a Yield Monitoring System for Pistachios*,” Transaction of the American Society of Agricultural and Biological Engineers (ASABE), 2011.

Posters and Demos

Haksoo Choi, Pandarasamy Arjunan, Mani B Srivastava, Amarjeet Singh, Supriyo Chakraborty, Chenguang Shen, Mahbubur Rahman, “*Middleware for Pervasive Sensing and Actuation*,” UCLA Engineering Tech Forum, Poster Presentation, May 2013.

Pandarasamy Arjunan, Manaswi Saha, Manoj Gulati, Haksoo Choi, Nipun Batra, Amarjeet Singh, Mani B Srivastava, Pushpendra Singh, “*SensorAct: Design and Implementation of Fine-grained Sensing and Control Sharing in Buildings*,” The 10th USENIX Symposium on Networked Systems Design and Implementation (NSDI), Poster Presentation, April 2013.

Haksoo Choi, Max E Greenblatt, Zainul M Charbiwala, Supriyo Chakraborty, Mani B. Srivastava, “*SensorSafe: Privacy-Preserving Sharing of Sensory Information for Medical Studies and Healthcare*,” Center for Embedded Networked Sensing (CENS) 8th Annual Research Review, Poster Presentation, October 2010.

Yi Han, Kasturi Rangan Raghavan, Zainul Charbiwala, Haksoo Choi, Mani B. Srivastava, “*Physiological Data Collection on Mobile Devices*,” Center for Embedded Networked Sensing (CENS) 8th Annual Research Review, Poster Presentation, October 2010.

Chanmin Yoon, Haksoo Choi, Seungwoo Lee, Hojung Cha, Byunghun Song, Hyungsu Lee, “*Demo Abstract: IEEE 802.15.4a-Based Anchor-free Mobile Node Localization System*,” The 8th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN), Demo Presentation, April 2009.

Korean Conferences and Journals

Kwanghee Lee, Byunghun Song, Haksoo Choi, “*Location Control Technique for Industrial Robots Based on RTLS*,” Korea Computer Congress (KCC), July 2008.

Sukwon Choi, Hyojung Shin, Chanmin Yoon, Haksoo Choi, Hojung Cha, “*A Survey on Operating Systems for Wireless Sensor Networks*,” Communications of the Korea Information Science Society, December 2007.

Haksoo Choi, Kwanghee Lee, Taehyun Kim, Changkyun Lee, Ho Seok Ahn, Minwoo, Lee, Won Il Choi, Kyu Chul Kyung, Joongkil Shin, Minhyuck Kim, “*Home Network System Based on Wireless Sensor Networks for Intelligent Service Robot*,” Korean Conference on Power Electronics, July 2007.

Kwanghee Lee, Kyu Chul Kyung, Haksoo Choi, Taehyun Kim, Changkyun Lee, Ho Seok Ahn, Minwoo Lee, Won Il Choi, Joongkil Shin, Minhyuck Kim, “*Chair Robot System Using PSP*,” Korean Conference on Power Electronics, July 2007.

Changkyun Lee, WonIl Choi, Minwoo Lee, TaeHyun Kim, Ho Seok Ahn, JoongKil Shin, KwangHee Lee, KyuChul Kyung, Haksoo Choi, MinHyuck Kim, “*Design of Intelligent Head Robot Using Rotating LED Array*,” Korean Conference on Power Electronics, July 2007.

- TEACHING** Teaching Assistant, Embedded Systems, Graduate, University of California, Los Angeles, Summer 2011
- Teaching Assistant, Operating Systems, Undergraduate, Yonsei University, Seoul, Korea, Spring 2009.
- TALKS** “*SensorAct: A Privacy and Security Aware Federated Middleware for Building Management*,” The 4th ACM Workshop On Embedded Systems For Energy-Efficiency In Buildings (Buildsys), Toronto, Canada, November 2012.
- “*Design and Evaluation of SensorSafe: a Framework for Achieving Behavioral Privacy in Sharing Personal Sensory Information*,” The 2nd IEEE International Symposium on Security and Privacy in Internet of Things (TrustCom-SPIoT), Liverpool, UK, June 2012.
- “*SensorSafe: a Framework for Privacy-Preserving Management of Personal Sensory Information*,” The 8th VLDB Workshop on Secure Data Management (VLDB-SDM), Seattle, CA, September 2011.
- “*6LoWPAN-SNMP: Simple Network Management Protocol for 6LoWPAN*,” The 11th IEEE International Conference on High Performance Computing and Communications (HPCC), Korea, June 2009.
- “*Structural Health Monitoring System based on Strain Gauge Enabled Wireless Sensor Nodes*,” The 5th IEEE International Conference on Networked Sensing Systems (INSS), Kanazawa, Japan, June 2008.
- “*Location Control Techniques for Industrial Robots Based on RTLS*,” Korea Computer Congress 2008, Korea, June 2008.
- “*Device Driver Abstraction for Multithreaded Sensor Network Operating Systems*,” The 5th European Conference on Wireless Sensor Networks (EWSN), Bologna, Italy, February 2008.
- “*Surveillance Tracking System Using Passive Infrared Motion Sensors in Wireless Sensor Networks*,” The 22nd IEEE International Conference on Information Networking (ICOIN), Korea, January 2008.
- AWARDS** Best Paper Award, “*6LoWPAN-SNMP: Simple Network Management Protocol for 6LoWPAN*,” The 11th IEEE International Conference on High Performance Computing and Communications, 2009.
- Honorable Mention, “*Mom’s Friend*,” IEEE RO-MAN International Robot Design Competition, 2007.

Gold Award for College, “*Mom’s Friend*,” IEEE International Competition for Intelligent Robot Software, Ministry of Information and Communication / Korea University, 2007.

First Prize, “*Mom’s Friend*,” Intelligent Robot Competition, Kyungnam University, Korea, 2007.

Bronze Award, “*Home Network System based on Wireless Sensor Networks*,” The 5th I.E. Competition, Korea Institute of Power Electronics, 2007.

Award for Excellence, “*Structural Health Monitoring Using Wireless Sensor Nodes*,” Creativity Exhibition, College of Engineering, Yonsei University, Korea, 2007.

HONORS

High Honor Graduate, Yonsei University, 2007.

Highest Honor Student, Yonsei University, 2001 / 2004 / 2005.

FELLOWSHIPS/ SCHOLARSHIPS

- Ph.D. Fellowship: Kwanjeong Educational Foundation (2009–2014)
- Ph.D. Scholarship: Yonsei International Foundation (2011), Korea Foundation for Advanced Studies (2009)
- M.Sc. Scholarship: Brain Korea 21 Foundation (2007–2008), Yonsei University (2007)
- B.Sc. Scholarship: Daum Communications Inc. (2006), Joonha Hwang Foundation (2005), Yonsei University (2001)

OTHER EXPERIENCE

Computer Music

- Developed a drum teaching software based on open-source MIDI program as a part of M.Sc. course work. Used Windows MFC, Win32 API, 2008.

Band / Leadership Experience

- Medusa, Yonsei University, Korea, 2000–2002, 2004 / Director (2001): Promoted the club status from college level to semi-university by collaborating with the student club union.
- Forkcrane, a member of founders, Yonsei University, Korea, 2000–2002.
- Military Band, Republic of Korea Army, 2002–2004.
- MP22, a member of founders, Samsung S/W Membership, Korea, 2007.
- 11010, a member of founders, UCLA, 2011–2012 / Public concert at a live club, Empathy, Los Angeles, 06/2012.

ORGANIZATIONS

UCLA Korean Graduate Student Association, Staff Member	2010–2012
Republic of Korea Army, Discharged as a sergeant	2002–2004