

# Minsung Jang

## Contact Information

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## RESEARCH INTERESTS

Big-data analytics and AI/ML runtime platform, 5G/edge-cloud infrastructure, Network-oriented cloud for NFV/SDN, Hardware Accelerators.

## EDUCATION

*Ph.D.*, Computer Science  
Georgia Institute of Technology, Atlanta, GA August 2008 – 2105  
THESIS– Virtual Platforms: A System-level Execution Environment for the Clients at the Edge and Cloud  
Advisor: Professor Karsten Schwan  
*Master of Science*, Yonsei University, Seoul, Korea February 2000  
*Bachelor of Science*, Yonsei University, Seoul, Korea February 1998

## PROFESSIONAL EXPERIENCE

*AT&T Labs - Research* August 2015 – Present  
Principal-Inventive Scientist, AT&T Labs - Research, Bedminster, NJ

- Focusing on research topics related to a high-speed data plane, resource management for NFV/SDN & Edge-cloud systems, and 5G infrastructures.
- Projects previously or currently leading: (i) QoS-aware resource management framework for a software-defined network, (ii) edge systems for telecommunication service providers, (iii) software-defined 5G with big-data analytics, in particular, AI/ML-enabled vRAN, and (iv) New hardware abstractions and data paths for FPGA, GPU, and merchant silicon.

*Intel Labs* May – August 2012  
Graduate Research Intern, Integrated Platform Research, Hillsboro, OR

- Developed an efficient offloading framework for battery-operated mobile devices. Awarded Intel Kudos at Intel CountryFair 2012.
- Mentored by Omesh Tickoo and reported to Raj Yavatkar (Intel Fellow) and Ravi Iyer.

*Nokia Research Center* May – August 2011  
Graduate Research Intern, North America Research Palo Alto, Palo Alto, CA

- Designed and implemented of the COSA framework for a user-task continuum beyond a single device boundary (with a patent application).
- Mentored by Adhyas Avasthi and reported to Quinn Jacobson

*IBM Almaden Research Center* May – August 2010  
Graduate Research Intern, Storage System Group, Almaden, CA

- Developed a smart I/O orchestration for optimization of subscription cost for the cloud storage.
- Mentored by Sandip Agarwala and reported to Sandeep Gopisetty (IBM Distinguished Engineer)

*Samsung Electronics*  
Research Staff, Advanced Institute of Technology (Ki-hueng, Korea) January – July 2008

- Developed a new power-management method for mobile devices with the Xen hypervisor.

Senior Research Engineer, Software Laboratories (Suwon, Korea) August 2003 – December 2007

- Developed an OS virtualization-based software mobility solutions. Mainly contributed to the design of its virtual I/O framework.
- Served as the project lead of reliable file system (Klotho) for embedded Linux, which was used for a personal video recorder announced at CE Show 2007 by Samsung Electronics.
- Designed and implemented the I/O architecture of XPRESS file system shown in Ottawa Linux Symposium 2006.

SindoRicoh R&D Center

October 1999 – July 2003

Engineer, System Control Department, Seoul, Korea

- Conducted research to enhance real-time capabilities for embedded Linux systems including mechanisms for guaranteeing a deterministic response for real-time workloads.

### TEACHING EXPERIENCE

- *Guest Lecturer*, CS7210 Distributed Systems, GeorgiaTech Spring 2013
- *Graduate Teaching Assistant*, CS6210 Advanced Operating Systems, GeorgiaTech Spring 2012
- *Graduate Teaching Assistant*, Introduction to Computer Graphics, Yonsei University Spring 1999
- *In-house Instructor*, Understanding Advance Linux Kernel, Samsung Training Inst. 2004 – 2006

### PUBLICATIONS

Academic Papers

- Minsung Jang, HyunJong Lee, Karsten Schwan, Ketan Bhardwaj, *SOUL: An Edge-cloud System for Mobile Applications in a Sensor-rich World*, the First IEEE/ACM Symposium on Edge Computing, Washington DC, USA, October 2016.
- HyunJong Lee, William Agnew, Minsung Jang, Karsten Schwan, *Reducing Mobile Throttling from Temperature by offloading Apps*, Tiny Transactions on Computer Science Vol.4.
- HyunJong Lee, Minsung Jang, William Agnew, Ada Gavrilovska, *TeSLA: Thermal Service Level Agreement for Mobile Device*, The 17th International Workshop on Mobile Computing Systems and Applications (HotMobile 2016, poster).
- Minsung Jang, HyunJong Lee, Ketan Bhardwaj, Karsten Schwan, *vSensor: Toward Sensor-rich Mobile Applications*, Sensors to Cloud Architectures Workshop (SCAW-2015), Held in conjunction with HPCA-21, San Francisco, California, USA, February 2015.
- Minsung Jang, Karsten Schwan, Ketan Bhardwaj, Ada Gavrilovska, and Adhyas Avasthi, *Personal Clouds: Sharing and Integrating Networked Resources to Enhance End User Experiences*, IEEE International Conference on Computer Communications (IEEE INFOCOM) 2014, Toronto, Canada, April 2014. (Acceptance rate: 19.4%)
- Minsung Jang, Karsten Schwan, *Clouds4Users: From Isolated Devices to Rich Device Platforms*, short paper, 3rd Workshop on SoCs, Heterogeneous Architectures and Workloads (SHAW-3), Held in conjunction with HPCA-18, New Orleans, Louisiana, Feb 2012.
- Minsung Jang, Karsten Schwan, *STRATUS: Assembling Virtual Platforms from Device Clouds*, IEEE CLOUD 2011, Washington DC, July 2011. (Acceptance rate: 18%)
- SungKwan Heo, Minsung Jang, Sangbum Suh, *Software Mobility for Personalized Computing Environments on Removable Storage*, IEEE CCNC 2008, Las Vegas, January 2008.
- Jooyoung Hwang, Jaekyoung Bae, Alexander Kirnasov, Minsung Jang, Hayeong Kim, *A Reliable and Portable Multimedia File system*, Linux Symposium, Ottawa, Canada, July 2006.
- Minsung Jang, Jongsoo Lee, *Genetic algorithm based design of transonic airfoils using Euler equations*, AIAA/ASME/ASCE/AHS/ASC SDM Conference, Atlanta, GA, Apr. 2000.

## Book Chapters

- Understanding Embedded OS for New Employees, Samsung Advanced Technology Training Institute, Suwon, Korea 2005.

## Magazines

- A New File system Development Method for Linux, Real-time Embedded World Magazine (written in Korean), October 2006 – January 2007

## INVITED TALKS AND PRESENTATIONS

- The GPU Technology Conference 2018 (GTC 2018), *Building the Next Generation Internet Router: Practical GPU Based Packet Processing*, USA, San Carlos, March 2018
- The First IEEE/ACM Symposium on Edge Computing, *SOUL: An Edge-cloud System for Mobile Applications in a Sensor-rich World*, Washington DC, USA, October 2016.
- Sensors to Cloud Architectures Workshop, *vSensor: Toward Sensor-rich Mobile Applications*, San Francisco, February 2015.
- AT&T Labs – Research, *Virtual Platforms: A New System-level Execution Environment for the Clients*, Bedminster, NJ, January 2015.
- IBM Almaden Research Center, *Clients at the Edge and the Cloud: Integrated Functionality Servicing End User Needs*, Almaden, CA, October 2014.
- IEEE International Conference on Computer Communications, *Personal Clouds: Sharing and Integrating Networked Resources to Enhance End User Experiences*, Toronto, Canada, April 2014.
- Center for Experimental Research in Computer Systems, *System-level Infrastructure of Multi-layered Computing Environments for Home and Neighborhood*, Atlanta, GA, April 2014.
- Center for Experimental Research in Computer Systems, *Embedded Distributed Platforms*, Atlanta, GA, March 2012.
- IEEE CLOUD, *STRATUS: Assembling Virtual Platforms from Device Clouds*, Washington DC, July 2011.
- LinuxWorld Conference & Expo, *Technical Trends: Linux Multimedia File systems for embedded systems*, Seoul, Korea, July 2006.
- Technology Conference of Consumer Electronics Linux Forum, *Low Power Linux Platform Development*, Seoul, Korea, May 2005.
- Samsung System-LSI Division, *Power Management Features for ARM-based RISC in Linux*, June 2005.
- Hanyang University, *Issues of Developing Embedded Real-time OS*, Seoul, Korea, April 2005

## PATENTS

- Two U.S. patents on the GPU architecture have been filed in 2018.
- *Methods, apparatuses and computer program products for enhancing performance and controlling quality of service of devices by using application awareness*, US20140032787, January 30, 2014.
- *Method and apparatus for restoring system using virtualization*, US20090271605, January 22, 2013
- *Method and apparatus for inputting/outputting data using virtualization technique*, US20090216916, August 27, 2009
- *Virtual environment system and method for operating the same virtual environment system*, US20090241110, September 24, 2009
- *Method of managing data of file system using database management*, US20070226219, September 27, 2007
- *Apparatus and method for displaying graphic object with low power consumption*, US20070188440, August 16, 2007

## PROFESSIONAL SERVICE

- External reviewer, IEEE Computer March 2017
- External reviewer, the 47th IEEE/IFIP International Conference on Dependable Systems and Networks (IEEE DSN) January 2017
- External reviewer, Future Generation Computer Systems, Elsevier July 2016
- External reviewer, IEEE Internet Computing March 2016
- External reviewer, IEEE Transactions on Industrial Informatics December 2015
- External reviewer, Mastering Linux Kernel Development , Packt Publishing October 2015
- External reviewer, IEEE Micro August 2014

## OPEN SOURCE ACTIVITIES

- XenARM, the ARM Versatile Board support 2009

## HONORS & AWARDS

From Professional Experience

- Intel Kudos at Intel CountryFair 2012, Intel Corporation, July 2012

From Academia

- Intel Ph.D. fellowship nominee for 2013 – 2014 at the Georgia Institute of Technology
- Full 4-year Scholarship, Bando Medical Corporation, 1994 – 1998

## STUDENT SUPERVISION

Master Students

- Vaibhav Bedia (now Apple), Rajaram Shetty (now Microsoft), and Aneesh Mulye (now Google)

Undergraduate Students

- Hyunjong Lee (now a Ph.D. student at the University of Michigan)

## REFERENCES

Available upon request