Hanjun Kim

Curriculum Vitae

Contact Information

Department of Creative IT Engineering
Department of Computer Science and Engineering
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Education

Princeton University, Princeton, NJ
Ph.D. in Computer Science, September 2013
Thesis: "ASAP: Automatic Speculative Acyclic Parallelization for Clusters,"
Advisor: Prof. David I. August
M.A. in Computer Science, April 2009
Advisor: Prof. David I. August

Seoul National University, Seoul, Republic of Korea
Bachelor of Science in Electrical Engineering, June 2007
Thesis: "Design and Implementation of XCP Network Analyzer"
Advisor: Prof. Wook Hyun Kwon
Bachelor of Business Administration, June 2007
Thesis: "Case study: iRiver"
Advisor: Prof. Jungsuk Oh

Experience

Associate Professor, March 2018 to Present; **Assistant Professor**, July 2013 to February 2018
Department of Creative IT Engineering (CITE), *POSTECH*, South Korea
Joint-Appointed with the Department of Computer Science and Engineering (CSE)

Research Intern, June 2011 - September 2011
Intel Labs, Santa Clara, CA

Research Intern, July 2009 - August 2009
IBM Tokyo Research Laboratory, Japan

Research Intern, June 2009
Parakinetics, Princeton, NJ

Software Developer, January 2004 - November 2005
Army Computer Center, Headquarters of ROK Army

Programmer, July 2003 - August 2003
Mamurian Design, Seoul, Republic of Korea

Recognition

- Appointed as a Siebel Scholar based on academic achievement and excellence by the Siebel Scholars Foundation, 2012
- Awarded the Intel Corporation PhD Fellowship for pursuing leading-edge work in fields related to Intel's business and research interests, 2012
- Highest ranked paper in double-blind review process at the 43rd IEEE/ACM International Symposium on Microarchitecture (MICRO), 2010
- "Addressing the Multicore Problem" selected among the top innovations with commercial potential at the 4th Annual Innovation Forum held by the Keller Center for Innovation in Engineering Education, 2009
- Princeton University Graduate Fellowship, 2007-2008

- Grand Prize for embedded mobile messenger on XScale PXA255 at Embedded Software Contest hosted by Ministry of Information and Communication, Republic of Korea, December 2003
- Best Design Award, 2002 Samsung-SNU Digital ASIC Design course with Video game on ALTERA FPGA, July 2002

Activities

International Conference Organizing Committee

- Paper Submission Chair, The 42nd Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), 2009.

International Conference Technical Program Committees

- IEEE 11th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC), 2017.
- The 13th IEEE International Symposium on Parallel and Distrbuted Processing with Applications, 2015.

International Conference Session Chair

- The 18th Annual ACM SIGPLAN / SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2017.

Domestic Conference Organizing Committees

- Local Arrangements Chair, The KIISE Computer Systems Winter Workshop, 2017
- Local Arrangements Chair, The KIISE Computer Systems Winter Workshop, 2016
- Session Chair, KRNet, 2015
- Registration Chair, The KIISE Computer Systems Winter Workshop, 2015

Invited Talks

- "Rapid prototyping of IoT applications with Esperanto compiler" to be presented at the 28th International Symposium on Rapid System Prototyping (RSP), October 2017.
- "Esperanto: A Language Extension for Unified Internet-of-Things Programming" presented at the Fourth International Workshop on Parallelism in Mobile Platforms, Yonsei University and GIST, September-November 2016.
- "Esperanto: A Language Extension for Unified Internet-of-Things Programming" presented at the Fourth International Workshop on Parallelism in Mobile Platforms, June 2016.
- "Scalable Speculative Parallelization on Commodity Clusters" presented at UNIST, November 2015.
- "Automatic Computation Offload for Native Applications" presented at UNIST and SNU, November 2014-January 2015.
- "Smart Compilation for Heterogeneous Computer Systems from Mobile Platforms to Server Cloud " presented at Samsung Electronics, July 2014.
- "ASAP: Automatic Speculative Acyclic Parallelization on Clusters" presented at the KIISE Computer Systems Winter Workshop, Korea, January 2014.
- "ASAP: Automatic Speculative Acyclic Parallelization on Clusters" presented at SungKyunKwan University, Samsung Electronics, and POSTECH, December 2011 - January 2012.
- "Speculative Parallelization Using Software Multi-threaded Transactions," presented at IBM Tokyo Research Laboratory, July 2009.

University Service

- University Advancement Council, 2017
- University Committee on General Education for Freshmen, 2016-2017
- CITE Department's Graduate School Committee, 2017
- CITE Department's Undergraduate School Committee, 2015-2017
- CITE Department's Environment Space Committee, 2015-2016
- CITE Department Committee on Undergraduate Curriculum, 2013-2016

- CITE Department Committee on Research Activity, 2013-2016
- CITE Department Committee on Student Recruiting, 2013-2015
- CSE Department Committee on Student Recruiting, 2016-2017
- CSE Department's Undergraduate School Committee, 2014-2017
- CSE Department Committee on Faculty Recruiting, 2015, 2017

Teaching

- CITE 201, 202, 301, 302: Creative IT Design
  Fall 2013, Spring/Fall 2014, Spring/Fall 2015, Spring/Fall 2016, Spring/Fall 2017
- CSED 341: Automata and Formal Languages
  Spring 2015
- CSED 423: Compiler Design
  Fall 2013, Fall 2014, Fall 2015, Spring 2016, Spring 2017
- CITE 700/CSED 700: Parallel Programming
  Spring 2014, Spring 2017
- CITE 700/CSED702: Compiler Optimization for Modern Architectures
  Spring 2016

Students

Current Graduate Students

Gyeongmin Lee (year 3), Bongjun Kim (year 2), Seonyeong Heo (year 2), Changsu Kim (year 2), Juwon Kang (year 2), Bongjun Hyun (year 1), Seungbin Song (year 1), Sungjun Cho (year 1)

Completed Degrees

Juhyun Kim
Master of Science. Thesis: Context-Aware Memory Dependence Profiling
First Position: TmaxSoft (Military Service)

Hyunjoon Park
Master of Science. Thesis: Third-party Product Abstraction for Internet of Things Oriented Programming
First Position: TmaxSoft (Military Service)

Kyoungju Sim
Master of Science. Thesis: jSTM: JavaScript Software Transactional Memory System
First Position: TmaxSoft

Publications

Book Chapters

[1] David I. August, Jialu Huang, Thomas B. Jablin, Hanjun Kim, Thomas R. Mason, Prakash Prabhu, Arun Raman, and Yun Zhang, "Automatic Extraction of Parallelism from Sequential Code," in *Fundamentals of Multicore Software Development* edited by Ali-Reza Adl-Tabatabai, Chapman Hall / CRC Press, December 2011. (ISBN: 978-1439812730)

Refereed Journal Publications

[2] Bongjun Kim, Seonyeong Heo, Gyeongmin Lee, Soyeon Park, Hanjun Kim, and Jong Kim, "Heterogeneous Distributed Shared Memory for Lightweight Internet-of-Things Devices," in *IEEE Micro*, November 2016.

[3] Junwon Jang, Soohee Han, Hanjun Kim, Choon Ki Ahn, and Wook Hyun Kwon, "Rapid control prototyping for robot soccer," in *Robotica, 27 : 1091-1102 Cambridge University Press* , 2009.

Refereed Conference Publications

[4] Jiwon Choi, Hayoung Jeoung, Jihun Kim, Youngjoo Ko, Wonup Jung, Hanjun Kim, and Jong Kim, "Detecting and Identifying Faulty IoT Devices in Smart Home with Context Extraction," to appear in *Proceedings of the 48th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, June 2018.

[5] Changsu Kim, Juhyun Kim, Juwon Kang, Jae W. Lee, and Hanjun Kim, "Context-Aware Memory Profiling for Speculative Parallelism," in *Proceedings of the 24th IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC)*, December 2017.

[6] Seonyeong Heo, Seungbin Song, Jong Kim, and Hanjun Kim, "RT-IFTTT: Real-Time IoT Framework with Trigger Condition-aware Flexible Polling Intervals ," in *Proceedings of the IEEE Real-time Systems Symposium (RTSS)*, December 2017.

[7] Youngsok Kim, Jae-Eon Jo, Hanhwi Jang, Minsoo Rhu, Hanjun Kim, and Jangwoo Kim, "GPUpd: A Fast and Scalable Multi-GPU Architecture Using Cooperative Projection and Distribution," in *Proceedings of the 50th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO)*, October 2017.

[8] Gyeongmin Lee, Seonyeong Heo, Bongjun Kim, Jong Kim, and Hanjun Kim, "Rapid prototyping of IoT applications with Esperanto compiler," in *Proceedings of the 28th International Symposium on Rapid System Prototyping (RSP)*, October 2017. Invited.

[9] Gyeongmin Lee, Seonyeong Heo, Bongjun Kim, Jong Kim, and Hanjun Kim, "Integrated IoT Programming with Selective Abstraction," in *Proceedings of the 18th ACM SIGPLAN/SIGBAD Conference on Languages, Compilers, Tools, and Theory for Embedded Systems (LCTES)*, June 2017.

[10] Sanghak Lee, Jiwon Choi, Jihun Kim, Beumjin Cho, Sangho Lee, Hanjun Kim, and Jong Kim, "FACT: Functionality-centric Access Control System for IoT Programming Frameworks," in *Proceedings of the 22nd ACM Symposium on Access Control Models and Technologies (SACMAT)*, June 2017.

[11] Gwangmu Lee, Hyunjoon Park, Seonyeong Heo, Kyung-Ah Chang, Hyogun Lee, and Hanjun Kim, "Architecture-aware Automatic Computation Offload for Native Applications," in *Proceedings of the 48th IEEE/ACM International Symposium on Microarchitecture (MICRO)*, December 2015.

[12] Taewook Oh, Hanjun Kim, Nick P. Johnson, Jae W. Lee, and David I. August, "Practical Automatic Loop Specialization," in *Proceedings of the Eighteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2013.

[13] Nick P. Johnson, Hanjun Kim, Prakash Prabhu, Ayal Zaks, and David I. August, "Speculative Separation for Privatization and Reductions," in *Proceedings of the 33rd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2012.

[14] Hanjun Kim, Nick P. Johnson, Jae W. Lee, Scott A. Mahlke, and David I. August, "Automatic Speculative DOALL for Clusters," in *Proceedings of the 2012 International Symposium on Code Generation and Optimization (CGO)*, March 2012.

[15] Prakash Prabhu, Thomas B. Jablin, Arun Raman, Yun Zhang, Jialu Huang, Hanjun Kim, Nick P. Johnson, Feng Liu, Soumyadeep Ghosh, Stephen Beard, Taewook Oh, Matthew Zoufaly, David Walker, and David I. August, "A Survey of the Practice of Computational Science," in *Proceedings of the 24th ACM/IEEE Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, November 2011.

[16] Arun Raman, Hanjun Kim, Taewook Oh, Jae W. Lee, and David I. August, "Parallelism Orchestration using DoPE: the Degree of Parallelism Executive," in *Proceedings of the 32nd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2011.

[17] Hanjun Kim, Arun Raman, Feng Liu, Jae W. Lee, and David I. August, "Scalable Speculative Parallelization on Commodity Clusters," in *Proceedings of the 43rd IEEE/ACM International Symposium on Microarchitecture (MICRO)*, December 2010.
Highest ranked paper in double-blind review process.

[18] Arun Raman, Hanjun Kim, Thomas R. Mason, Thomas B. Jablin, and David I. August, "Speculative Parallelization Using Software Multi-threaded Transactions," in *Proceedings of the Fifteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2010.

Refereed Workshop Publications

[19] Thomas B. Jablin, Yun Zhang, James A. Jablin, Jialu Huang, Hanjun Kim, and David I. August, "Liberty Queues for EPIC Architectures," in *Proceedings of the Eighth Workshop on Explicitly Parallel Instruction Computer Architectures and Compiler Technology (EPIC)*, April 2010.

Refereed Poster Publications

[20] Xianglan Piao, Channoh Kim, Younghwan Oh, Huiying Li, Jincheon Kim, Hanjun Kim, and Jae W Lee, "JAWS: A JavaScript Framework for Adaptive CPU-GPU Work Sharing," in *Proceedings of the 20th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming - Poster (PPoPP Poster)*, February 2015.

[21] Xianglan Piao, Channoh Kim, Younghwan Oh, Hanjun Kim, and Jae W Lee, " Efficient CPU-GPU Work Sharing for Data-parallel JavaScript Workloads ," in *Proceedings of the Companion Publication of the 23rd International Conference on World Wide Web Companion (WWW Companion)*, April 2014.

Other Publications

[22] Hanjun Kim, "ASAP: Automatic Speculative Acyclic Parallelization for Clusters," Ph.D. Dissertation, Princeton University, September 2013.

Patents

[23] Changsu Kim, Seonyeong Heo, and Hanjun Kim, "A Method of Compiling a Program," KR Patent App. 10-2017-0080764, June 2017.

[24] Bongjun Kim, Jong Kim, Soyeon Park, Hanjun Kim, Seonyeong Heo, and Gyeongmin Lee, "Heterogeneous Distributed Shared Memory For IoT Devices," KR Patent App. 10-2017-0020650, February 2017.

[25] Jaewoong Chung, Hanjun Kim, and Youfeng Wu, "Power gating functional units of a processor," US Patent Number 8,954,775, February 2015.

[26] Hanjun Kim, Hyunjoon Park, and Gwangmu Lee, "Mobile device and method of automatically offloading native applications," KR Patent App. 10-2014-0191139, December 2014.

[27] Jaewoong Chung, Youfeng Wu, Cheng Wang, and Hanjun Kim, "Method, apparatus, and system for energy efficiency and energy conservation including code recirculation techniques," US Patent App. 13/327,683, July 2012.

[WO Patent App. PCT/US2012/069,236 and CN Patent App. 201,280,069,797]