Hanjun Kim

Curriculum Vitae

CONTACT INFORMATION

School of Electrical and Electronic Engineering   +82-02-2123-2770
Yonsei University   hanjun@yonsei.ac.kr
Engineering Hall #3 C415   http://www.corelab.or.kr/~hanjun
50 Yonsei-Ro Seodaemun-gu
Seoul,Republic of Korea, 03722

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
    April 5, 2009 To September 21, 2013
M.A. in Computer Science, April 2009
    Advisor: Prof. David I. August
    September 17, 2007 To April 4, 2009

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
    March 1, 2000 To August 30, 2007
Bachelor of Business Administration, June 2007
    Thesis: "Case study: iRiver"
    Advisor: Prof. Jungsuk Oh
    March 1, 2000 To August 30, 2007

EXPERIENCE

Associate Professor, September 1, 2018 to Present
School of Electrical and Electronic Engineering, *Yonsei University*, Republic of Korea

Associate Professor, March 1, 2018 to August 31, 2018; **Assistant Professor**, July 1, 2013 to February 28, 2018
Department of Creative IT Engineering (CITE), *POSTECH*, Republic of Korea
Joint-Appointed with the Department of Computer Science and Engineering (CSE)

Research Intern, June 6, 2011 to September 13, 2011
Intel Labs, Santa Clara, CA

Research Intern, June 29, 2009 to August 31, 2009
IBM Tokyo Research Laboratory, Japan

Research Intern, June 15, 2009 to June 26, 2009
Parakinetics, Princeton, NJ

Software Developer, January 13, 2004 to November 26, 2005
Army Computer Center, Headquarters of ROK Army

Programmer, July 1, 2003 to August 31, 2003
Mamurian Design, Seoul, Republic of Korea

Recognition

- Best Teaching Award, Yonsei University, 2020
- 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

- Local Arrangement Chair, International Symposium on Code Generation and Optimization (CGO), 2021.
- Paper Submission Chair, The 42nd Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), 2009.

International Conference Technical Program Committees

- The 26th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), 2020
- The 21st ACM SIGPLAN/SIGBED International Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), 2020
- The IEEE International Conference on Computer Design (ICCD), 2019, 2020
- IEEE International Symposium on Workload Characterization (IISWC), 2018
- IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC), 2017, 2018 and 2019.
- 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.

International Conference External Review Committees

- The 25th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2020

Domestic Conference Organizing Committees

- Local Arrangements Chair, The KIISE Computer Systems Winter Workshop, 2016, 2017, 2018 and 2019
- Session Chair, KRNet, 2015
- Registration Chair, The KIISE Computer Systems Winter Workshop, 2015
- Member, Committee of Next Generation at The Korean Institute of Information Scientists and Engineers(KIISE), 2020

- Information and Communication Technology Research Panel, Samsung Research Funding Center of Samsung Electronics, 2017, 2018 and 2019
- Information and Communication Technology Research Panel, National Research Foundation of Korea, 2018

Advisory Committee

- Member of CEO Round-table for Envisioning Advanced TEchnology (CREATE), SK Hynix, 2018-2019

Invited Talks

- "High-Level Synthesis for Lightwight Io Devices" presented at Korea University, September 10th, 2019.
- "HW/SW Cooperative Framework for the Internet-of-Things" presented at Microsoft Research Workshop for Intelligent Cloud and Intelligent Edge, June 21st, 2019.
- "Compiler Techniques for Machine Learning" presented at Samsung Electronics, June 4th, 2019.
- "Embedded SW for IoT" presented at IEEE CEDA Seoul Section Winter Workshop, January 27th, 2019.
- "HW/SW Cooperative Framework for the Internet-of-Things" presented at Korea University, October 16th, 2018.
- "Real Time IoT System and Memory" presented at the SK Hynix Top Talent Symposium, October 5th, 2018.
- "Esperanto: Intelligent SW/HW Cooperative Framework for the IoT" presented at the KIISE Computer Systems Society Winter Conference, Korea, January 16th, 2018.
- "Rapid prototyping of IoT applications with Esperanto compiler" 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 at Yonsei University

- EE Department's Undergraduate School Committee, 2020
- EE Department's Graduate School Committee, 2019, 2020

University Service at POSTECH

- University Advancement Council, 2017-2018
- University Committee on General Education for Freshmen, 2016-2017
- CITE Department's Graduate School Committee, 2017-2018
- 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, 2016-2018
- CSE Department's Undergraduate School Committee, 2014-2018
- CSE Department Committee on Faculty Recruiting, 2015, 2017, 2018

Teaching

- EEE 5505: Advanced Operating Systems
  Fall 2019
- EEE 7980: Management and Revolution of IT Technology
  Fall 2019
- EEE 3540: Microprocessors
  Fall 2019
- EEE 2020: Data Structure and Algorithms
  Spring 2019, Spring 2020
- EEE 3313: Introductory Digital Labs
  Spring/Fall 2019, Spring 2020
- EEE 3545: Application Programming
  Fall 2018
- EEE 6504: Compiler Design and Optimization
  Fall 2018
- CITE 201, 202, 301, 302: Creative IT Design
  Fall 2013, Spring/Fall 2014, Spring/Fall 2015, Spring/Fall 2016, Spring/Fall 2017, Spring 2018
- CSED 341: Automata and Formal Languages
  Spring 2015
- CSED 423: Compiler Design
  Fall 2013, Fall 2014, Fall 2015, Spring 2016, Spring 2017, Spring 2018
- 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 6), Bongjun Kim (year 5), Seonyeong Heo (year 5), Changsu Kim (year 5), Seungbin Song (year 4), Yongwoo Lee (year 2), Shinnung Jeong (year 2), Jaeho Lee (year 1), Kunwoo Kim (year 1), Dongkwan Kim (year 1)

Completed Degrees

Sungjun Cho
Master of Science. Thesis: Regularized graph processing on GPU
First Position: Ph.D. student at POSTECH

Bongjun Hyun
Master of Science. Thesis: Timing Analysis of CNN Inference on GPU
First Position: Ph.D. student at KAIST

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] Seonyeong Heo, Sungjun Cho, Youngsok Kim, and Hanjun Kim, "Real-Time Object Detection System with Multi-Path Neural Networks," to appear in *Proceedings of the IEEE Real-Time And Embedded Technology And Applications Symposium (RTAS)*, April 2020.

[5] Seonyeong Heo, Seungbin Song, Bongjun Kim, and Hanjun Kim, "Sharing-aware Data Acquisition Scheduling for Multiple Rules in the IoT," to appear in *Proceedings of the IEEE Real-Time And Embedded Technology And Applications Symposium (RTAS)*, April 2020.

[6] Bongjun Kim, Seonyeong Heo, Gyeongmin Lee, Seungbin Song, Jong Kim, and Hanjun Kim, "Spinal Code: Automatic Code Extraction for Near-User Computation in Fogs," in *Proceedings of the 28th International Conference on Compiler Construction (CC)*, February 2019.

[7] Dongju Chae, Joonsung Kim, Gwangmu Lee, Hanjun Kim, Kyung-Ah Chang, Hyogun Lee, and Jangwoo Kim, "DynaMix: Dynamic Mobile Device Integration for Efficient Cross-device Resource Sharing," in *USENIX Annual Technical Conference (ATC)*, July 2018.

[8] 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," in *Proceedings of the 48th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, June 2018.

[9] 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.

[10] 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.

[11] 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.

[12] 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.

[13] 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.

[14] 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.

[15] 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.

[16] 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.

[17] 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.

[18] 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.

[19] 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.

[20] 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.

[21] 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.

[22] 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

[23] 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

[24] 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.

[25] 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

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

PATENTS

[27] Changsu Kim, Seonyeong Heo, and Hanjun Kim, "A Method of Compiling a Program," US Patent Number 10,372,430, August 2019.

[28] Bongjun Kim, Jong Kim, Soyeon Park, Hanjun Kim, Seonyeong Heo, and Gyeongmin Lee, "Heterogeneous Distributed Shared Memory For IoT Devices," KR Patent Number 10-18579070000, February 2017.

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

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

[31] 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]