Seonyeong Heo

Curriculum Vitae

Contact Information

Department of Computer Science and Engineering
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Education

Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea
Integrated M.S./Ph.D. Student, March 2016 to Present
Advisor: Prof. Hanjun Kim

Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea
Bachelor of Science in Computer Science and Engineering, March 2011 to February 2016

Experience

Research Assistant, March 2016 to Present
Compiler Research Laboratory (Corelab), *POSTECH / Yonsei University*, Republic of Korea

- Developing compiler techniques to improve programmability in IoT programming (IEEE MICRO 2016, LCTES'17, CC'19)
- Designing scheduling algorithms for real-time decision making in IoT systems (RTSS'17, RTAS'20)
- Developing deep neural network models for embedded systems (RTAS'20, Preparing for RTSS'20 submission)
- Optimizing deep neural network execution for embedded systems (Preparing for LCTES'20 submission)

Research Scholar, July to December 2017
Department of Computer Science, *Virginia Tech*, Blacksburg, Virginia, United States

- Optimizing deep neural networks for mobile devices with CPU-GPU collaborative computing
- Investigating possible concurrency bugs in OpenCL kernels

Undergraduate Research Assistant, March 2015 to February 2016
Compiler Research Laboratory (Corelab), *POSTECH*, Pohang, Republic of Korea

- Developing a compiler framework that automatically partitions native applications for seamless mobile-cloud computing (MICRO'15)

Undergraduate Student Intern, July to August 2015
School of Computing, *National University of Singapore (NUS)*, Singapore

- Developing a program for collecting public opinions on the Internet
- Analyzing the collected data through topic modeling

Exchange Student, July to December 2014
School of Computing, *National University of Singapore (NUS)*, Singapore

- Participating in various activities in NUS such as local community service as a scholar of the TF LEaRN programme

Recognition

- Best Poster Award at KIISE Computer System Society Winter Workshop, February 2020
- Best Poster Award at KIISE Computer System Society Winter Workshop, January 2018
- Magna Cum Laude from POSTECH, February 2016
- Temasek Foundation Leadership Enrichment and Regional Networking (TF LEaRN) Scholarship, 2014
- The National Scholarship for Science and Engineering, Korean Student Aid Foundation, 2011 to 2015
- Honor Student Awards, Department of Computer Science and Engineering, POSTECH, 2011 to 2013

Activities

Domestic Conference Organizing Assistant

- Local Arrangements Assistant, KIISE Computer System Society Winter Workshop, January 2019
- Local Arrangements Assistant, KIISE Computer System Society Winter Workshop, January 2018
- Local Arrangements Assistant, KIISE Computer System Society Winter Workshop, January 2017

International Conference Reviewer

- External Reviewer, The 46th International Symposium on Compiler Architecture (ISCA)

International Conference Sub-reviewer

- Sub-reviewer, The 25th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)
- Sub-reviewer, The 37th IEEE International Conference on Computer Design (ICCD)
- Sub-reviewer, 2018 IEEE International Symposium on Workload Characterization (IISWC)

Undergraduate Experience in Extracurricular Activities

- Leader of the Stage Management Team, POSTECH-KAIST Science War Arrangement Committee, June to September 2013
- Secretary, Freshmen Orientation Arrangement Committee, December 2012 to February 2013
- Student Reporter, The Postech Times, May 2011 to February 2013
- Volunteer for the Mentoring Program, Korea Student Aid Foundation, September to December 2012

Teaching

- IR Optimization with LLVM
  Lecturer, Electronics and Telecommunications Research Institute (ETRI), 10-11 April 2019
  (Teaching how to write LLVM passes for program analysis and optimization)
- CSED 423: Compiler Design
  Teaching Assistant, POSTECH, Spring 2017
  (Teaching weekly lab classes about compiler implementation and grading lab assignments)
- CSED 321: Programming Languages
  Teaching Assistant, POSTECH, Spring 2016
  (Taking office hours and grading homeworks)

Publications

Refereed Journal Publications

[1] Gyeongmin Lee, Bongjun Kim, Seungbin Song, Seonyeong Heo, and Hanjun Kim, "ComFlex: Composable and Flexible Resource Management for the IoT," in *IEEE IoT*, 2020.

[2] Bongjun Kim, Seonyeong Heo, Jaeho Lee, Shinnung Jeong, Yongwoo Lee, and Hanjun Kim, "Compiler-assisted Semantic-aware Encryption for Efficient and Secure Serverless Computing," in *IEEE Internet of Things Journal (Early Access)*, October 2020.
IF=9.936, Q1 (JCR 2019)

[3] Gyeongmin Lee, Bongjun Kim, Seungbin Song, Seonyeong Heo, and Hanjun Kim, "ComFlex: Composable and Flexible Resource Management for the IoT," in *IEEE Internet of Things Journal (Early Access)*, September 2020.
IF=9.936, Q1 (JCR 2019)

[4] 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.
IF=1.933, Q2 (JCR 2016)

Refereed Conference Publications

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

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

[7] 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.

[8] 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.

[9] 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.

[10] 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.

[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.

Patents

[12] Hanjun Kim, Seonyeong Heo, Jong Kim, and Bongjun Kim, "Write Control Method and Disk Controller for Automated Backup and Recovery," KR Patent Number 10-21896070000, December 2019.

[13] Hye-Yeon Chung, Hanjun Kim, Jong-Won Lee, Changsu Kim, Seonyeong Heo, Jun-Mo Park, and Jong-Hee Yoon, "A Method of Compiling a Program," US Patent Number 10,372,430, August 2019.

[14] 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.