

# 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] 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.

### REFEREED CONFERENCE PUBLICATIONS

- [2] 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.
- [3] 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.
- [4] 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.

- [5] 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.
- [6] 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.
- [7] 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.
- [8] 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

- [9] Hanjun Kim, Seonyeong Heo, Jong Kim, and Bongjun Kim, “Write Control Method and Disk Controller for Automated Backup and Recovery,” KR Patent App. 10-2019-0164414, December 2019.
- [10] Changsu Kim, Seonyeong Heo, and Hanjun Kim, “A Method of Compiling a Program,” US Patent Number 10,372,430, August 2019.
- [11] 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.