

# Hojin Park

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## RESEARCH INTEREST

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Cloud computing, Distributed storage systems, Scalable machine learning systems

## EDUCATION

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Carnegie Mellon University (CMU) Ph.D. Student in Computer Science Department Advisors: Prof. George Amvrosiadis, Prof. Greg Ganger	Sep. 2019 – Present. <i>Pittsburgh, PA</i>
Seoul National University (SNU) B.S. in Electrical and Computer Engineering Graduated with Summa Cum Laude (GPA: 4.21 / 4.30)	Mar. 2013 – Feb. 2019 <i>Seoul, Republic of Korea</i>
Korea Science Academy of KAIST Math & Science specialized high school	Mar. 2010 – Mar. 2013 <i>Busan, Republic of Korea</i>

## RESEARCH EXPERIENCE

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Parallel Data Lab, CMU <i>Ph.D. Student (Advisors: Prof. George Amvrosiadis, Prof. Greg Ganger)</i>	Sept. 2019 – Present. <i>Pittsburgh, PA</i>
Software Platform Lab, SNU <i>Research Intern (Advisor: Professor Byung-Gon Chun)</i>	Jan. 2017 – Aug. 2019 <i>Seoul, Republic of Korea</i>
<ul style="list-style-type: none"><li>• <b>Parallax</b>: a tool for automatic parallelization of deep learning training<ul style="list-style-type: none"><li>◦ Transforms a single-GPU deep learning model for distributed execution, handling correctness and scalability.</li><li>◦ I used Parallax to explore two distributed training designs: Parameter Server and AllReduce.</li><li>◦ I implemented four deep learning models with each distributed architecture to better understand these designs.</li><li>◦ I ran experiments to evaluate these models on Parallax, in terms of correctness, scalability, and optimization.</li></ul></li><li>• <b>Cruise</b>: a distributed machine learning framework with automatic system configuration<ul style="list-style-type: none"><li>◦ Optimizes a system by adjusting worker/server assignment to homogeneous clusters at runtime.</li><li>◦ I enabled Cruise to work with heterogeneous cluster sets by implementing a custom linear-programming-based solver to optimize a generalized cost model.</li><li>◦ I implemented a Gradient Boosting Tree (GBT) application on top of Cruise.</li></ul></li></ul>	
Virtual Machine and Optimization Lab, SNU <i>Research Intern (Advisor: Professor Soo-Mook Moon)</i>	Jan. 2018 – July. 2018 <i>Seoul, Republic of Korea</i>
<ul style="list-style-type: none"><li>• <b>GitChain</b>: a distributed version control system using blockchain<ul style="list-style-type: none"><li>◦ Uses a public ledger to save version controlled repositories in InterPlanetary File System (IPFS).</li><li>◦ I designed and implemented blockchain-related components of the system.</li><li>◦ I implemented basic Git functions, such as push, pull, and clone, on the IPFS.</li></ul></li></ul>	

## SCHOLARSHIPS & AWARDS

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International Graduate Student Scholarship <i>Full tuition, insurance, and living expenses (5 years)</i>	Sep. 2019 - Aug. 2024 <i>Korea Foundation for Advanced Studies</i>
Blockchain Technology Competition <i>Two-person team won first prize (\$3,000), with GitChain project</i>	Jul. 2018 <i>LINE, KIISE</i>
Undergraduate Study Scholarship <i>Full tuition and stipend (\$2,500/semester)</i>	Feb. 2017 - Dec. 2018 <i>Kwanjeong Educational Foundation</i>
Academic Excellence Scholarship <i>Full tuition</i>	Jun. 2013 - Dec. 2014 <i>SNU</i>

## TEACHING EXPERIENCE

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Operating Systems  
*Teaching Assistant*

Spring 2019  
*SNU*

## PROGRAMMING SKILLS

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- Languages: C/C++, Java, Python, SQL
- Multicore/GPU Libraries: OpenCL, CUDA, MPI, OpenMP
- Other: Tensorflow, Horovod, Gurobi (ILP)

## PUBLICATIONS AND PREPRINTS

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[1] Woo-Yeon Lee, Yunseong Lee, Joo Seong Jeong, Gyeong-In Yu, Joo Yeon Kim, Hojin Park, Beomyeol Jeon, Wonwook Song, Gunhee Kim, Markus Weimer, Brian Cho, Byung-Gon Chun. Automating System Configuration of Distributed Machine Learning. *ICDCS 2019*, March 2019.

[2] Soojeong Kim, Gyeong-In Yu, Hojin Park, Sungwoo Cho, Eunji Jeong, Hyeonmin Ha, Sanha Lee, Joo Seong Jeong, Byung-Gon Chun. Parallax: Sparsity-aware Data Parallel Training of Deep Neural Networks. *EuroSys' 19*, March 2019.

[3] Soojeong Kim, Eunji Jeong, Joo Seong Jeong, Gyeong-In Yu, Hojin Park, Byung-Gon Chun. Auto-Parallelizing Deep Learning for Multi-machine, Multi-GPU Environments. *Workshop on AI Systems at Symposium on Operating Systems Principles (SOSP)*, October 2017.