Inho Cho

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Education

Ph.D. Computer Science — *Cambridge, MA*

Massachusetts Institute of Technology (MIT) — *Sep. 2018 - Jun. 2023 (expected)*

Computer Science and Artificial Intelligence Laboratory (CSAIL)
Advisors: Prof. Adam Belay and Prof. Mohammad Alizadeh

M.S. Electrical Engineering — *Daejeon, Korea*

Korea Advanced Institute of Science and Technology (KAIST) — *Sep. 2015 - Feb. 2018*

Thesis title: "ExpressPass:Credit-scheduled delay-bounded congestion control for datacenters"
Advisor: Prof. Dongsu Han

B.S. Electrical Engineering — *Daejeon, Korea*

Korea Advanced Institute of Science and Technology (KAIST) — *Feb. 2008 - Aug. 2015*

Summa Cum Laude

Research Interest

Low-latency RPCs, Datacenter Resource Management, Operating Systems

Research Projects

Tail Latency Debugging Tool for Datacetner Applications — *Feb. 2022 - Present*

A framework to debug/monitor latency behavior of datacenter applications at a function level with low overhead, high visibility, and great interactivity by Call Stack Sampling

Overload Control for Microsecond-scale RPCs — *Sep. 2018 - Present*

An OS-level control mechanism to minimize SLO violations caused by the congestion in CPU and shared resources [C-3], [C-4], [S-3].

Credit-based End-to-end Congestion Control for Datacenter Networks — *Mar. 2016 - Aug. 2018*

Datacenter congestion control where credit packets schedule the data packet transmission. It achieves low latency and great fairness with small buffer occupancy [C-2], [C-5], [S-2].

Large-scale Combinatorial Optimization using Belief Propagation — *Aug. 2014 - Mar. 2016*

A framework to approximate large-scale combinatorial optimization with high accuracy and short running time using belief propagation algorithm [C-1].

Publications

Conference Proceedings

[C-5] FlexPass: A Case for Flexible Credit-based Transport for Datacenter Networks
Hwijoon Lim, Jaehong Kim, **Inho Cho**, Keon Jang, Wei Bai, Dongsu Han
EuroSys 2023, Rome, Italy (to appear)

[C-4] Protego: Overload Control for Applications with Unpredictable Lock Contention
Inho Cho, Ahmed Saeed, Seo Jin Park, Mohammad Alizadeh, Adam Belay
NSDI 2023, Boston, MA (to appear)

[C-3] Overload Control for μs-scale RPCs with Breakwater
Inho Cho, Ahmed Saeed, Joshua Fried, Seo Jin Park, Mohammad Alizadeh, Adam Belay
OSDI 2020, Virtual Conference

[C-2] Credit-scheduled Delay-bounded Congestion Control for Datacenters
Inho Cho, Keon Jang*, Dongsu Han*
*co-corresponding authors
ACM SIGCOMM 2017, Los Angeles, CA, US

[C-1] Practical Message-passing Framework for Large-scale Combinatorial Optimization
Inho Cho*, Soya Park*, Sejun Park, Dongsu Han, Jinwoo Shin
* co-first authors
IEEE International Conference on Big Data 2015, Santa Clara, CA, US

Patents

[P-1] Congestion Control for Low Latency Datacenter Networks
Gautam Kumar, Nandita Dukkipati, Keon Jang, **Inho Cho**
US 10,999,206 B2, May. 2021
Owned by Google LLC

Software

[S-3] Breakwater implementation on Shenango
Main contributor
https://inhocho89.github.com/breakwater

[S-2] ExpressPass ns-2 simulator
Main contributor
https://github.com/kaist-ina/ns2-xpass

[S-1] Belief Propagation-based Combinatorial Optimization Tool
Main contributor
https://github.com/kaist-ina/bp_solver

Honors & Awards

2018	**Fellowship**, The Irwin Mark Jacobs and Joan Klein Jacobs Presidential Fellowship	*MIT*
2015	**Dean's list**, Outstanding Scholastic Achievement in KAIST College of Engineering	*KAIST*
2015	**Grand Prix**, 2015 Winter/Spring KAIST Undergraduate Research Project Workshop	*KAIST*

Teaching Experience

6.828: Operating System Engineering — *MIT*
Teaching Assistant — *Fall 2020*

EE817B: Special Topics in Advanced Networking and Cloud Computing — *KAIST*
Teaching Assistant — *Fall 2016*

Work Experience

Google Inc. — *Mountain View, CA, USA*
Software Engineering Intern — *Feb. 2017 - Aug. 2017*
Contributed to a low latency network congestion control in Google datacenter [P-1].
Developed a prototype for credit-based congestion control in Google datacenter.
Hosted by Dr. Keon Jang (network infrastructure group)

Smatoos Inc. — *Seoul, Korea*
Web & Mobile Application Developer Intern — *Aug. 2011 - Feb. 2012*
Developed educational mobile applications for iOS.
Developed websites using WordPress.

Volunteer Experience

Victor Francisco Rosales Ortega (Public School) — *Piura, Peru*
Korea International Cooperation Agency (KOICA) volunteer — *Jun. 2012 - May 2014*
Taught office automation (OA), programming, and maintenance to students and teachers.