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
  A framework to debug/monitor latency behavior of datacenter applications at a function level   *Feb. 2022 - Present*
  with low overhead, high visibility, and great interactivity by Call Stack Sampling

Overload Control for Microsecond-scale RPCs
  An OS-level control mechanism to minimize SLO violations caused by the congestion in CPU   *Sep. 2018 - Present*
  and shared resources [C-3], [C-4], [S-3].

Credit-based End-to-end Congestion Control for Datacenter Networks
  Datacenter congestion control where credit packets schedule the data packet transmission.   *Mar. 2016 - Aug. 2018*
  It achieves low latency and great fairness with small buffer occupancy [C-2], [O-1], [S-2].

Large-scale Combinatorial Optimization using Belief Propagation
  A framework to approximate large-scale combinatorial optimization with   *Aug. 2014 - Mar. 2016*
  high accuracy and short running time using belief propagation algorithm [C-1].

Publications

CONFERENCE PROCEEDINGS

[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*
Fall 2020

Teaching Assistant

EE817B: Special Topics in Advanced Networking and Cloud Computing · *KAIST*
Fall 2016

Teaching Assistant

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.