

Inho Cho

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Education

Ph.D. Computer Science

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)

Computer Science and Artificial Intelligence Laboratory (CSAIL)

Advisors: Prof. Adam Belay and Prof. Mohammad Alizadeh

Cambridge, MA

Sep. 2018 - Jun. 2023 (expected)

M.S. Electrical Engineering

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)

Thesis title: "ExpressPass:Credit-scheduled delay-bounded congestion control for datacenters"

Advisor: Prof. Dongsu Han

Daejeon, Korea

Sep. 2015 - Feb. 2018

B.S. Electrical Engineering

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)

Summa Cum Laude

Daejeon, Korea

Feb. 2008 - Aug. 2015

Research Interest

Datacenter Resource Management, Microsecond-scale RPCs, Congestion Control

Research Projects

Fine-grained Latency Monitor for Datacenter Applications with Low Overhead

A framework to monitor function-level latency behavior to diagnose and debug the latency anomalies in datacenter applications.

Feb. 2022 - Present

Overload Control for Microsecond-scale RPCs

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

Sep. 2018 - Present

Credit-based End-to-end Congestion Control for Datacenter Networks

Datacenter congestion control where credit packets schedule the data packet transmission. It achieves low latency and great fairness with small buffer occupancy [C-2], [O-1], [S-2].

Mar. 2016 - Aug. 2018

Large-scale Combinatorial Optimization using Belief Propagation

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

Aug. 2014 - Mar. 2016

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 μ s-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 Dukkkipati, 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://inchocho89.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

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

2018 **Fellowship**, The Irwin Mark Jacobs and Joan Klein Jacobs Presidential Fellowship

MIT

Teaching Experience

EE817B: Special Topics in Advanced Networking and Cloud Computing

Teaching Assistant

KAIST

Fall 2016

6.828: Operating System Engineering

Teaching Assistant

MIT

Fall 2020

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.