

Hyungsoo Jung

FULL PROFESSOR · SEOUL NATIONAL UNIVERSITY

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Research Interests

The primary research focuses on **database-oriented operating systems (DBOS)** designed for AI/ML applications and hybrid transactional/analytical processing (HTAP) workloads. Key areas of interest include developing scalable and efficient DBOS systems optimized for exceptional processing speeds. Additionally, we explore system architectures that enable **distributed, data-parallel computing** to support scalable deep learning frameworks effectively.

Education

Seoul National University

Seoul, South Korea

PH.D. IN COMPUTER SCIENCE AND ENGINEERING (ADVISOR: PROF. HEON Y. YEOM)

Mar 2004 - Aug 2009

- Study on end-to-end Internet congestion control for high bandwidth-delay product networks.

Seoul National University

Seoul, South Korea

M.S. IN COMPUTER SCIENCE AND ENGINEERING (ADVISOR: PROF. HEON Y. YEOM)

Mar 2002 - Feb 2004

- Study on soft real-time operating systems.

Korea University

Seoul, South Korea

B.S. IN MECHANICAL ENGINEERING

Mar 1995 - Feb 2002

- Mandatory military service: Dec 1998 - Feb 2001.

Employment History

Seoul National University

Seoul, South Korea

FULL PROFESSOR IN GRADUATE SCHOOL OF DATA SCIENCE

Mar 2024 - present

- Database-oriented operating systems (DBOS) - DB and OS synergies for data-centric systems
- Distributed data-parallel computing for scalable AI systems

Hanyang University

Seoul, South Korea

FULL PROFESSOR IN COMPUTER SCIENCE

Sep 2015 - Feb 2024

- Research on new directions towards database operating systems for large-scale data management
- Research on MVCC database systems for hybrid transactional/analytical processing workloads
- Research on high-performance relational databases and key-value storage on new memory technologies

Amazon Web Services

Seattle, WA, USA

SR. SOFTWARE DEVELOPMENT ENGINEER (A FOUNDING MEMBER OF AMAZON AURORA DATABASE)

Oct 2012 - Aug 2015

- Developed high-performance transaction processing in Amazon Aurora

National ICT Australia

Kensington, NSW, Australia

RESEARCHER (RESEARCH GROUP LEADER: PROF. GERNOT HEISER AT UNSW)

Apr 2012 - Sep 2012

- Developed a scalable transaction locking system for multicore hardware

The University of Sydney

Sydney, NSW, Australia

POSTDOCTORAL RESEARCHER (POSTDOC ADVISOR: PROF. ALAN FEKETE)

Apr 2010 - Apr 2012

- Developed a tight theorem for serializable snapshot isolation for replicated snapshot databases

Professional Services and Research/Teaching Excellence

2026	Program Committee Chair , DASFFA 2026	Jeju, Korea
2025-2026	Review Board Member , The VLDB Journal	
2026	Program Committee Member , ACM SIGMOD Conference 2026	Bengaluru, India
2026	Program Committee Member , VLDB Conference 2026	Boston, USA
2025	Program Committee Member , ACM SIGMOD Conference 2025	Berlin, Germany
2025	Program Committee Member , VLDB Conference 2025	London, UK
2022	Best Teacher Award , Hanyang University	South Korea
2022	Program Committee Member , IEEE ICDE 2022	Malaysia
2021	Program Committee Member , ACM SIGMOD Conference 2021	Xian, China
2021	Best Paper Honorable Mention Award , ACM SIGMOD Conference 2021	Xian, China
2019	Best Teacher Award , Hanyang University	South Korea
2013	One of the Four Best Papers , ACM SIGMOD Conference 2013	New York, USA

Selected (Top-tier) Publications († - equal contribution)

Counting Is All You Need for Instant Tuple Discovery: Enabling Real-Time HTAP in Standalone DBMSs

ACM SIGMOD 2026

KYEONGMIN LIM, MINSEOK YOON†, KIHWAN KIM†, ALAN FEKETE, Hyungsoo Jung

June 2026

Rapid Data Ingestion through DB-OS Co-design

ACM SIGMOD 2025

KYEONGMIN LIM†, MINSEOK YOON†, KIHWAN KIM†, ALAN FEKETE, Hyungsoo Jung

June 2025

Deploying Computational Storage for HTAP DBMSs Takes More Than Just Computation Offloading

VLDB 2023

KITAEK LEE†, INSOON JO†, JAECHAN AHN†, HYUK LEE, HWANG LEE, WOONG SUL, Hyungsoo Jung

August 2023

Diva: Making MVCC Systems HTAP-Friendly

ACM SIGMOD 2022

JONGBIN KIM†, JAESEON YU†, JAECHAN AHN, SOOYONG KANG, Hyungsoo Jung

June 2022

Rethink the Scan in MVCC Databases

ACM SIGMOD 2021

JONGBIN KIM†, KIHWANG KIM†, HYUNSOO CHO, JAESEON YU, SOOYONG KANG, Hyungsoo Jung

June 2021

- This paper received **ACM SIGMOD 2021 Honorable Mention Award** (8 out of 209 accepted papers).
- https://2021.sigmod.org/sigmod_best_papers.shtml

Long-lived Transactions Made Less Harmful

ACM SIGMOD 2020

JONGBIN KIM, HYUNSOO CHO, KIHWANG KIM, JAESEON YU, SOOYONG KANG, Hyungsoo Jung

June 2020

BORDER-COLLIE: A Wait-free, Read-optimal Algorithm for Database Logging on Multicore Hardware

ACM SIGMOD 2019

JONGBIN KIM, HYEONGWON JANG, SEOHUI SON, HYUCK HAN, SOOYONG KANG, Hyungsoo Jung

June 2019

Pay Migration Tax to Homeland: Anchor-based Scalable Reference Counting for Multicores

USENIX FAST 2019

SEOKYONG JUNG, JONGBBIN KIM, MINSOO RYU, SOOYONG KANG, Hyungsoo Jung

February 2019

Scalable Database Logging for Multicores

VLDB 2018

Hyungsoo Jung, HYUCK HAN, SOOYONG KANG

August 2018

TCPRand: Randomizing TCP Payload Size for TCP Fairness in Data Center Networks

IEEE INFOCOM 2015

SOOJEON LEE, MYUNGJIN LEE, DONGMAN LEE, Hyungsoo Jung, BYOUNG-SUN LEE

May 2015

A Scalable Lock Manager for Multicores

Hyungsoo Jung, HYUCK HAN, ALAN FEKETE, GERNOT HEISER, HEON Y. YEOM

- This article is an extended version of the SIGMOD'13 paper.

ACM TODS

December 2014

Scalable Serializable Snapshot Isolation for Multicore Systems

HYUCK HAN, SEONGJAE PARK, Hyungsoo Jung, ALAN FEKETE, UWE ROEHM

IEEE ICDE 2014

April 2014

A Scalable Lock Manager for Multicores

Hyungsoo Jung, HYUCK HAN, ALAN FEKETE, GERNOT HEISER, HEON Y. YEOM

- This paper is selected as **one of the four best papers** and invited to ACM Transactions on Database Systems (TODS).
- Forward message: <https://dl.acm.org/doi/abs/10.1145/2697050>
- The key ideas are **fully commercialized** as transaction locking systems in Amazon Aurora Databases.

ACM SIGMOD 2013

June 2013

Serializable Snapshot Isolation for Replicated Databases in High-Update Scenarios

Hyungsoo Jung, HYUCK HAN, ALAN FEKETE, UWE ROEHM

VLDB 2011

August 2011

Adaptive Delay-based Congestion Control for High Bandwidth-Delay Product Networks

Hyungsoo Jung, SHIN-GYU KIM, HEON Y. YEOM, SOOYONG KANG, LAVY LIBMAN

IEEE INFOCOM 2011

April 2011