Hokeun Cha

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https://chahk0129.github.io/

Research Interests

Database systems, storage systems, distributed systems

- New hardware for systems: SmartNIC, RDMA, CXL memory, byte-addressable storage
- Core systems techniques: indexing, concurrency control

Education

University of Wisconsin-Madison — Madison, WI
Ph.D. in Computer Science — Jan. 2021 – Present
- Advisor: Xiangyao Yu

Sungkyunkwan University — Seoul, South Korea
M.S. in Electrical and Computer Engineering — Sep. 2018 – Aug. 2020
- Thesis: Leveraging Byte-Addressability of Persistent Memory for B+-tree
- Advisor: Beomseok Nam

B.S. in Computer Science and Engineering — Mar. 2012 – Aug. 2018
B.B.A. in Business Administration — (incl. Korean military service)

Work Experience

University of Wisconsin-Madison — Madison, WI
Research Assistant in Database Group — May 2021 – Present
- Leveraging learned indexing in time-series databases
- Exploring CXL memory in analytical databases
- Accelerating distributed indexing and concurrency control with RDMA/SmartNIC
- Designing scalable index structures

Microsoft — Redmond, WA
Research Intern in Gray Systems Lab (GSL) — Summer, 2025

Intel — Hillsboro, OR
Software Engineering Intern in DataPlatforms Future Technology Team — Summer, 2022
- Performance study in storage systems

Sungkyunkwan University — Seoul, South Korea
Researcher in Convergence Research Institute — Sep. 2020 – Dec. 2020
- Memory disaggregation over RDMA network

Research Assistant in Data-Intensive Computing Lab (DICL) — Sep. 2018 – Aug. 2020
- Designing index structures for persistent memory

Referred Publications

[1] *"Disaggregated Memory for File-backed Pages"*,
Daegyu Han, Jaeyoon Nam, **Hokeun Cha**, Changdae Kim, Kwangwon Koh, Taehoon Kim, Sang-Hoon Kim, Beomseok Nam,
ACM Transactions on Storage (**TOS**), *to appear*

[2] *"Towards Accelerating Data Intensive Application's Shuffle Process Using SmartNICs"*,
Jiaxin Lin, Tao Ji, Xiangpeng Hao, **Hokeun Cha**, Yanfang Le, Xiangyao Yu, Aditya Akella,
Proceedings of the ACM on Measurement and Analysis of Computing Systems (**SIGMETRICS**),
Jun. 2023.

[3] *"B^{link}-hash: An Adaptive Hybrid Index for In-Memory Time-Series Databases"*,
Hokeun Cha, Xiangpeng Hao, Tianzheng Wang, Huanchen Zhang, Aditya Akella, Xiangyao Yu, Proceedings of the **VLDB** Endowment, Feb. 2023

[4] *"Pivotal B+ tree for Byte-Addressable Persistent Memory"*,
Jonghyeon Yoo, **Hokeun Cha**, Wonbae Kim, Wook-Hee Kim, Sung-Soon Park, Beomseok Nam, IEEE **Access**, vol. 10, pp. 46725–46737, Apr. 2022.

[5] *"B^3-tree: Byte-Addressable Binary B-Tree for Persistent Memory"*,
Hokeun Cha, Moohyeon Nam, Kibeom Jin, Jiwon Seo, Beomseok Nam,
ACM Transactions on Storage (**TOS**), vol. 16, no. 3, pp. 1–27, Jul. 2020.

[6] *"Write-Optimized Dynamic Hashing for Persistent Memory"*,
Moohyeon Nam, **Hokeun Cha**, Young-ri Choi, Sam H. Noh, Beomseok Nam,
Proceedings of the 17th USENIX Conference on File and Storage Technologies (**FAST**), Feb. 2019.

Work-In-Progress

[1] *"Smart Offloading: Beyond RDMA for Disaggregated Memory Databases"*,
Hokeun Cha, Aditya Akella, Xiangyao Yu.

Talks

"B^{link}-hash: An Adaptive Hybrid Index for In-Memory Time-Series Databases"

- Database Group Seminar, Cornell University, Ithaca, NY *(remote)* — Feb. 2024
- VLDB Conference, Vancouver, Canada, — Feb. 2023.
- Database Affiliates Workshop, UW-Madison, Madison, WI — Oct. 2022

"Write-Optimized Dynamic Hashing for Persistent Memory"

- Korea Software Congress (KSC), Pyeongchang, South Korea — Dec. 2019

Teaching Experience

University of Wisconsin-Madison — Madison, WI
Teaching Assistant

- CS564: Database Management Systems — Spring, 2021

Sungkyunkwan University — Seoul, South Korea
Teaching Assistant

- SWE3021: Multi-core Computing — Fall, 2019
- SWE3006: Programming Languages — Spring, 2019

Honors

Computer Science Departmental Scholarship — Spring, 2021 – Fall, 2021
University of Wisconsin-Madiosn, Madison, WI

Merit-based Scholarship for Graduate Students — Fall, 2018 – Spring, 2020
Sungkyunkwan University, Seoul, South Korea

Merit-based Scholarship for Undergraduate Students — Spring, 2013
Sungkyunkwan University, Seoul, South Korea

Services

Reviewer, *Journal of Cluster Computing* — 2024
Reviewer, *Journal of Supercomputing* — 2024
Reviewer, *Journal of Supercomputing* — 2023

Last update: May, 2025.