

Deukyeon Hwang

Ph.D. Candidate

deukyeon@cs.washington.edu

Paul G. Allen School of Computer Science & Engineering
University of Washington

EDUCATION

Ph.D. in Computer Science and Engineering

2022-Present

Paul G. Allen School of Computer Science & Engineering at University of Washington, Seattle, WA
Advisor: Simon Peter

M.S. in Computer Science and Engineering

2017-2019

Ulsan National Institute of Science and Technology, Ulsan, Republic of Korea
Thesis: *Endurable Transient Inconsistency in Byte-Addressable Persistent B+-Tree*
Advisor: Young-ri Choi and Beomseok Nam

B.S. in Electrical and Computer Engineering

2010-2014

Ulsan National Institute of Science and Technology, Ulsan, Republic of Korea
2nd Major: Technology Management/Information Systems/Entrepreneurship

PUBLICATIONS

- Syed Akbar Mehdi, **Deukyeon Hwang**, Simon Peter, and Lorenzo Alvisi. ScaleDB: A Scalable, Asynchronous In-Memory Database. In *17th USENIX Symposium on Operating Systems Design and Implementation*, Boston, MA. Jul. 2023.
- Timothy Stamler, **Deukyeon Hwang**, Amanda Raybuck, Wei Zhang, and Simon Peter. zIO: Accelerating IO-Intensive Applications with Transparent Zero-Copy IO. In *16th USENIX Symposium on Operating Systems Design and Implementation*, Carlsbad, CA. Jul. 2022.
- Sunghwan Ahn, Hyeongjun Park, Vicente A. B. Sanchez, **Deukyeon Hwang**, Wonbae Kim, Alan Sussman, and Beomseok Nam. VeloxDFS: Streaming Access to Distributed Datasets for Overcommit Scheduling. In *22nd IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing*, Taormina (Messina), Italy. May. 2022.
- Wook-Hee Kim, **Deukyeon Hwang**, Jonghyeon Yoo, Youjip Won and Beomseok Nam. FAST and FAIR B+-Tree for Byte-Addressable Persistent Memory. In *10th Annual Non-Volatile Memories Workshop*, San Diego, CA. Mar. 2019.
- Deukyeon Hwang**, Wook-Hee Kim, Youjip Won, and Beomseok Nam. Endurable Transient Inconsistency in Byte-Addressable Persistent B+-Tree. In *16th USENIX Conference on File and Storage Technologies*, Oakland, CA. Feb. 2018.
- Vicente A. B. Sanchez, Wonbae Kim, Youngmoon Eom, Kibeom Jin, Moohyeon Nam, **Deukyeon Hwang**, Jik-Soo Kim, and Beomseok Nam. EclipseMR: Distributed and Parallel Task Processing with Consistent Hashing. In *19th IEEE International Conference on Cluster Computing*, Honolulu, Hawaii. Sep. 2017.
- Youngmoon Eom, **Deukyeon Hwang**, Junyong Lee, Jonghwan Moon, Minhoo Shin, and Beomseok Nam. EM-KDE: A Locality-Aware Job Scheduling Policy with Distributed Semantic Caches. *Journal of Parallel and Distributed Computing*, Volume 83, pp 119-132, Elsevier. Sep. 2015.
- Youngmoon Eom, Jinwoong Kim, **Deukyeon Hwang**, Jaewon Kwak, Minhoo Shin, Beomseok Nam. Improving Multi-dimensional Query Processing with Data Migration in Distributed Cache Infrastructure. In *21st IEEE International Conference on High Performance Computing*, Goa, India. Dec. 2014.
- Beomseok Nam, **Deukyeon Hwang**, Jinwoong Kim, and Minhoo Shin. High-Throughput Query Scheduling with Spatial Clustering based on Distributed Exponential Moving Average. *Special issue on data intensive eScience, Distributed and Parallel Databases*, Volume 30, Issue 5-6, pp 401-414, Springer. 2012.

INVITED TALKS

Endurable Transient Inconsistency in Byte-Addressable Persistent B+-Tree, Korea Computer Congress

June 2018

WORK EXPERIENCE

- University of Washington**, Seattle, WA **2022-Present**
Graduate Research Assistant (Supervisor: Simon Peter)
- Reduced high disk I/O overhead in timestamp-based concurrency control by designing an approximation storage, resulting in higher transaction goodput approximately 6–14x against counterparts while using minimal memory footprints
 - Optimized data copy in applications and I/O stacks for improved performance
 - Implemented experimental features for a scalable in-memory database system
- TikTok**, Bellevue, WA **Summer 2025**
Research Intern (Mentors: Frank Hu, Jiwei Lu, and Nicolas Denoyelle)
- Enabled GPU-accelerated operators into query execution engine in OLAP databases
 - 5.2x performance gain in ORDERBY query latency against CPU
 - Conducted deep performance analysis using NVIDIA NSight tool
- VMware Research**, Palo Alto, CA **Summer 2022**
Research Intern (Mentors: Carlos Garcia, Rob Johnson, and Adriana Szekeres)
- Built the first transactional system for SplinterDB, an open-source and fast on-disk key-value store, by adapting the modern in-memory concurrency control called TicToc.
- University of Texas**, Austin, TX **2019-2022**
Graduate Research Assistant (Supervisor: Simon Peter)
- Optimized copy operations in applications and I/O stacks for improved performance
 - Implemented experimental features for a scalable database system
- UNIST**, Ulsan, Republic of Korea **2017-2019**
Graduate Research Assistant (Supervisor: Beomseok Nam)
- Overcame the consistency-performance trade-off in non-volatile memory B+-trees by designing algorithms tolerating transient inconsistency with high-concurrency
 - Our B+-tree outperformed up to 33% in range query performance against the state-of-the-art persistent indices and 20x faster than skiplist. In addition to the range query, it consistently shows the best performance in our TPC-C evaluation
- Hewlett Packard Enterprise**, Palo Alto, CA **Summer 2018**
Research Intern (Mentors: Kimberly Keeton and Sharad Singhal)
- Prototyped APIs for fabric-attached memory (FAM) using libfabric
- Tastelog (The Ventures Lab)**, Seoul, Republic of Korea* **2015-2016**
Back-end Server Developer
- Engineered back-end server APIs and administrative tools using Ruby on Rails
 - Analyzed and organized customer data with SQL and NoSQL databases
- JellyBus**, Seoul, Republic of Korea* **2014-2015**
iOS Developer
- Developed and maintained photo-editing iOS applications using Objective-C
 - Enhanced image processing libraries based on iOS frameworks
- University of Maryland**, College Park, MD **Summer 2013**
Visiting Research Student (Supervisor: Alan Sussman)
- Conducted comprehensive survey on distributed graph processing systems and algorithms

*Military service

TEACHING EXPERIENCE

University of Washington , Seattle, WA Teaching Assistant <i>CSE381A: Operating Systems Capstone</i>	Spring 2023
University of Texas at Austin , Austin, TX Teaching Assistant <i>CS395T: Datacenters</i>	Fall 2021
University of Texas at Austin , Austin, TX Teaching Assistant <i>CS378: Multicore Operating Systems Implementation</i>	Spring 2020
Ulsan National Institute of Science and Technology , Ulsan, Republic of Korea Teaching Assistant <i>ITP107: Engineering Programming</i>	Spring 2017

HONORS AND AWARDS

Student Grant. USENIX FAST18, Oakland, CA • Supported 1,000 USD to attend the conference	2018
Merit-based Full Scholarship. Korea Student Aid Foundation(KOSAF), Republic of Korea	2010-2014
The Second Winner. KSC13, Seoul, Republic of Korea • Received the prize of 700,000 KRW	2013
Global Scholarship for Internship. UNIST, Ulsan, Republic of Korea • Supported 3,000,000 KRW	2013
Finalist Award. ASC13, Shanghai, China	2013
Experiencing HPC Undergraduate Program. SC13, Salt Lake City, Utah • Supported all expenses at the conference	2012