


Minguk Choi

Master of Science

Dankook University, Yongin, Korea

 GitHub Profile

 Personal Website

 mgchoi@dankook.ac.kr

RESEARCH INTEREST

- ML for System (Learned Index)
- System for ML (Scheduler for ML Cluster)

ON-GOING PROJECT

- **Semi-ordered Parallel Updatable Learned Index**
 - Enhances performance in multi-threaded environments by reducing the critical section and data sorting overhead while maintaining lookup performance and size.
- **Adaptive Sample Training Algorithm for Learned Index**
 - An algorithm for dynamically training with the sub-optimal sampling interval by considering the data distribution and error-bound.
- **Accelerating Learned Index via SIMD**
 - Accelerating the unique training and operations (e.g., model-biased insert) of learned index through the parallelism of internal ML models, which has not yet been actively studied.

EDUCATION

- | | |
|---|--------------------|
| • Dankook University | Yongin, Korea |
| MS in AI-based Convergence / Advisor: Jongmoo Choi | Mar 2023 - Present |
| • Dankook University | Yongin, Korea |
| BS in Software Science/ Salutatorian (GPA:4.1/4.5) | Mar 2017 - Feb 23 |

PUBLICATIONS

International Conference

- **[SIGMOD 24]** Can Learned Indexes be Built Efficiently? A Deep Dive into Sampling Trade-Offs
Minguk Choi, Seehwan Yoo, Jongmoo Choi

International Journal

- **[Electronics 23]** An Empirical Study of Segmented Linear Regression Search in LevelDB
Ramadhan Agung Rahmat, Minguk Choi, Yoojin Chung, Jongmoo Choi.

Domestic Conference

- **[KCC 24]** Breakdown Internal Operations in Updatable Learned Index
Suhwan Shin, Minguk Choi, Nakyeong Kim, Seehwan Yoo, Jongmoo Choi
- **[KCC 24]** Analysis of Updatable Learned Indexes with Index Size Perspective
Nakyeong Kim, Minguk Choi, Suhwan Shin, Seehwan Yoo, Jongmoo Choi
- **[KCC 24]** Accelerating RMI Training with SIMD
Boseung Kim, Minguk Choi, Yeojin Oh, Yongjie Zhu, Seehwan Yoo, Jongmoo Choi
- **[KCC 24]** Analysis of RMI Using CPU-Optimized Search Algorithms
Yeojin Oh, Minguk Choi, Boseung Kim, Yongjie Zhu, Seehwan Yoo, Jongmoo Choi
- **[KCC 24]** Performance Analysis of Batch Prediction Using SIMD in RMI
Yongjie Zhu, Minguk Choi, Yeojin Oh, Boseung Kim, Seehwan Yoo, Jongmoo Choi
- **[KSC 22]** Bloom Filter Optimization in LevelDB based on Hit-Ratio
Hansu Kim, Minguk Choi, Seehwan Yoo, Jongmoo Choi
- **[KSC 22]** Read performance analysis according to Compaction Trigger
Zhao Guangxun, Sangwoo Kang, Minguk Choi, Seehwan Yoo, Jongmoo Choi
- **[KSC 22]** LevelDB Cache Structure and Performance Analysis
Subin Hong, Minguk Choi, Seehwan Yoo, Jongmoo Choi
- **[KSC 22]** Per Key-Value Checksum Analysis on RocksDB
Suhwan Shin, Seyeon Park, Minguk Choi, Seehwan Yoo, Jongmoo Choi

OPENSOURCE CONTRIBUTION

- | | |
|--|------------------|
| • BASIL
Benchmark of sampling applied learned indexes (To be released) | Owner |
| • Leveldb Study/Wiki
Analysis document about leveldb | Owner |
| • YCSB-CPP
Yahoo! Cloud Serving Benchmark(YCSB) written in C++ | Contributer |
| • Uftrace
Function graph tracer for C/C++/Rust/Python | Wiki Contributor |
| • PGM-Index
State-of-the-art learned data structure | Bug Report |

EXPERIENCE

- | | |
|--|---|
| • Student Researcher
System Software Laboratory | Dankook University
Jul 2021 - Present |
| • Teaching Assistant
– Operating System, Dankook University
– Index Structure Study, Dankook University
– System Programming, Dankook University
– Operating System Practice, Dankook University
– LevelDB Study, Dankook University | Mar 2024 - Present
Jan 2024 - Feb 2024
Sep 2023 - Dec 2023
Sep 2023
Jul 2022 - Aug 2022 |
| • Compulsory Military Service
Honorable Discharge | Korean Air Force
Jan 2019 - Oct 2020 |

PROJECT

- | | |
|---|--------------------|
| • Key-Value DB for Unstructured Big Data (SW StarLab) IITP | Jul 2021 - Present |
| • Key-Value Store with Predictable Latency Support NRF | Mar 2022 - Present |
| • Future Vehicle Security System KEA | May 2023 - Present |

LANGUAGE AND TECHNICAL SKILLS

- **Languages:** Native korean, Englsih (TOEIC 970/990, OPIc IH)
- **Programming Languages:** c/c++, python
- **Developer Tools:** gcc/g++, gdb, uftrace, git, matplotlib
- **System Knowledge:** Leveldb, Rocksdb

PERSONAL INTERESTS

- **Fitness:** Running, Weight lifting
- **Cooking:** Korean Cuisine, Japanese Cuisine, Grilling

REFERENCES

- | | |
|---|--|
| • Prof. Jongmoo Choi choijm@dankook.ac.kr | Software Science, Dankook University |
| • Prof. Seehwan Yoo seehwan.yoo@dankook.ac.kr | Mobile Systems Engineering, Dankook University |