# Sekwon Lee

*Curriculum Vitae*
*August 13, 2018*

## PERSONAL DETAILS


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| *Nationality* | Republic of Korea |
| *Birth* | February 18, 1990 |
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## RESEARCH INTEREST

**Systems**

- Areas: Storage and File systems, Database, Operating Systems, Distributed Systems
- Focus: Non-Volatile Memory (NVM), Persistent memory (PM) aware system design
  - Key-value store and its core indexing structures
  - Improving the performance and reliability of NVM-based file systems

## EDUCATION

**Ph.D. Computer Science** 2018-present
*The University of Texas at Austin*

**M.S. Computer Science Engineering (advised by Sam H. Noh)** 2018
*Ulsan National Institute of Science and Technology (UNIST)*

- Visiting student in Virginia Tech (2017.03 - 2017.05)
  - Co-research advised by Prof. Changhee Jung.
  - Participating in the project of a new fault-tolerant programming model for NVM.

**B.S. Computer Engineering** 2015
*Hongik University*

## WORK EXPERIENCE

**Researcher** 03.2018-07.2018
*Ulsan National Institute of Science and Technology (UNIST)*

- Working in NECSST laboratory under Prof. Sam H. Noh.
  - Working for a project that proposes the compiler-directed solution on NVM-based systems

**Research Associate Intern** 06.2017-09.2017
*Hewlett Packard Labs in Palo Alto*

- Working in key-value store (KVS) group with Kimberly Keeton, Haris Volos and Yupu Zhang.

  - Attending a DRAM cache project for NVM-aware KVS working on Fabric-attached memory.

**Researcher** 10.2015-02.2016
*Ulsan National Institute of Science and Technology (UNIST)*

- Working in NECSST laboratory under Prof. Sam H. Noh.
  - Analyzing NVM-based file system (PMFS) and evaluating the performance of it.

## PUBLICATION

***Conference***

**iDO: Compiler-Directed Failure Atomicity for Nonvolatile Memory**, Qingrui Liu, Joseph Izraelevitz, Se Kwon Lee, Michael L. Scott, Sam H. Noh, and Changhee Jung, In Proceedings of the 51st Annual IEEE/ACM International Symposium on Microarchitecture (MICRO 2018).

**WORT: Write Optimal Radix Tree for Persistent Memory Storage Systems**, Se Kwon Lee, K. Hyun Lim, Hyunsub Song, Beomseok Nam, and Sam H. Noh., In Proceedings of the 15th USENIX Conference on File and Storage Technology (FAST 2017).

- This paper proposes radix tree variants, WORT and WOART, that are optimal for PM in the sense that consistency is always guaranteed by a single 8-byte failure atomic write without any additional copies for logging or CoW. In this work, I designed and implemented these PM-based radix tree variants.

**PMAL: Enabling Lightweight Adaptation of Legacy File Systems on Persistent Memory Systems**, Hyunsub Song, Young Je Moon, Se Kwon Lee and Sam H. Noh, In Proceedings of the 2017 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS 2017).

- This paper proposes PMAL (Persistent Memory Adaptation Layer) that allows us to make use of legacy file system for PM while we can leverage the maturity ingrained in legacy file systems and reap the high performance offered by PM. In this work, I verified PMAL consistency mechanism and conducted experimental evaluations.

**Experimental Evaluation of File System Data Structures for New Memory based Storage** (written with Korean), Se Kwon Lee, Hyunsub Song, Young Je Moon and Sam H. Noh, In Proceedings of the 2016 Korea Computer Congress (KCC 2016, domestic conference in South Korea, **Best Paper Award**).

- This paper shows empirical studies about NVM-dedicated file system, PMFS. In this work, I measured and analyzed the performance of PMFS while changing index structures and logging mechanisms.

***Workshop***

**WORT: Write Optimal Radix Tree for Persistent Memory Storage Systems** (Extended abstract of FAST 2017 paper), Se Kwon Lee, K. Hyun Lim, Hyunsub Song, Beomseok Nam, and Sam H. Noh, 8th Annual Non-Volatile Memories Workshop (NVMW 2017).

**Transforming Legacy File Systems into Persistent Memory Exploiting File Systems with MeLo@V**, Hyunsub Song, Young Je Moon, Se Kwon Lee, and Sam H. Noh, 8th Annual Non-Volatile Memories Workshop (NVMW 2017).

- This project presents a simple yet general method, which we call MeLo@V (Metadata Logging at the VFS layer), for transforming legacy file systems into PM exploiting file systems. In this work, I implemented the variations of PMFS and NOVA for replacing their original consistency mechanisms with MeLo@V.

## SKILLS

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| *Languages* | C, C++, Python, x86 assembly, bash script |
| *System programming* | Linux kernel, Memcached, Tizen |
| *Benchmarks* | Filebench, Fio, YCSB, ForestDB-benchmark, MC-benchmark, SPLASH3, Parsec, SPEC SFS2014 |

## REFERENCES


**Sam H. Noh**
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