DONGHYUN SOHN

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EDUCATION

Northwestern University Evanston, IL
Ph.D. in Computer Science Sep. 2022 - Present
- Advisor : Jennie Rogers

Sogang University Seoul, Republic of Korea
B.S. in Computer Science and Engineering Feb. 2016 - Aug. 2021
- Early Graduation, Summa Cum Laude

EXPERIENCE

Graduate Research Assistant, Northwestern University (Prof. Jennie Rogers) Evanston, IL
Sep. 2022 - Present
- Focused on optimizing query processing within secure multi-party computation environments, particularly in private data federations, by enhancing performance for oblivious query workloads
- Applied advanced techniques such as query rewrite rules, plan enumeration, and operator selection tailored to the unique challenges of oblivious query workloads
- Integrated fully homomorphic encryption into the query processing pipeline, working on performance optimizations and efficiency improvements
- Crafted strategies leveraging columnar databases and compression methods to streamline query execution and optimize the sorting phase within secure environments

Undergraduate Research Intern, Big Data Processing Lab (Prof. Sungwon Jung) Seoul, Republic of Korea
Aug. 2020 - Dec. 2021
- Enhanced the BIRCH clustering algorithm by developing a disk-based Clustering Feature (CF) tree with a novel buffer mechanism, addressing BIRCH's limitations in handling large-scale data, such as degraded clustering quality due to memory constraints
- Implemented selective buffering at specific tree levels, leading to a substantial reduction in disk I/O operations and enhancing overall clustering performance, particularly for large datasets
- Improved clustering quality and consistency by up to 7% over traditional methods, demonstrating superior performance in purity and recall metrics across datasets of varying sizes

Team Leader, Bangladesh Startup Support Project Seoul, Republic of Korea
Mar. 2021 - Aug. 2021
- Led a cross-functional team of 5 in developing a real-time surveillance system using OpenPose, achieving over 80% accuracy in identifying improper behavior and automating alerts to supervisors
- Collaborated with UI/UX designers to design and implement a comprehensive database and build an interconnected Android application, website, and server, resulting in a fully integrated system adopted by Rokkhi for real-time employee tracking and duty compliance
- Facilitated the development of a product that helped secure $2200 in funding, awarded to the Rokkhi team by the Korea Invention Promotion Association and Korea Economic TV for outstanding innovation and successful implementation

PUBLICATIONS

1. **Donghyun Sohn,** Xiling Li, Jennie Rogers, "Everything You Always Wanted to Know About Secure and Private Database Systems (but were Afraid to Ask)" **Data Engineering Bulletin** 2023.

2. **Donghyun Sohn,** Sungwon Jung, "Disk-based BACF Tree for Clustering Massive Datasets," **Korea Software Congress** 2021. **(Encouragement Prize)**

3. **Donghyun Sohn,** Jinwon Jung, Hyungjoon Kwon, Donghyuk Jeong, Dayoung Yoon, Myungwan Koo, "A real-time monitoring system using OpenPose," **Korea Software Congress** 2021. **(Excellence Prize)**

AWARDS

Excellence Prize, Korea Software Congress 2021 Dec 2021

Encouragement Prize, Korea Software Congress 2021 Dec 2021

SKILLS

Programming	C, C++, JAVA, Python, HTML, CSS, PostgreSQL, MySQL
Frameworks	Django
Tools	Git
Languages	English, Korean

TEACHING EXPERIENCES

Teaching Assistant,

- COMP_SCI 339: Intro to Database Systems, Northwestern University 2023, 2024 Fall