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Hyunmo Sung

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Education

Computer science **March 2020 - February 2023**
Yonsei university, Seoul, Korea
Master, Gradutated

Main courses: Multicore computing topics, Introduction to approximation algorithms

Computer science **March 2016 - February 2020**
Yonsei university, Seoul, Korea
Bachelor, Gradutated

Main courses: Algorithm analysis, Computer graphics, Compiler design, Multicore programming fundamentals

Multimedia engineering **March 2014 - February 2016**
Dongguk university, Seoul, Korea
Bachelor, Drop out for transfer to other university

Main courses: Multimedia Data Structures, Internet Programming, Multimedia Programming

Work Experience

Researcher **February 2020 - February 2023**
ELC(Embedded Systems Languages and Compilers Lab) *Yonsei University, Seoul, Korea*

- Researched about the profile-guided-optimization.
- Implemented and evaluated the performance of the bloom filter using CUDA unified memory.
- Evaluated the performance of lazy parallel kronecker algebra on the modern GPU T4.
- Joint Research Project with DS Division of Samsung Inc. through Yonsei-Samsung Semiconductor Research Center (YSSRC) Program.

Internship **July 2019 - February 2020**
ELC(Embedded Systems Languages and Compilers Lab) *Yonsei University, Seoul, Korea*

- Researched about the kronecker algebra to detect the deadlock of the program.

Publication

Performance Evaluation of GPU-based Bloom Filters Using CUDA Unified Memory **2022**
***Hyunmo Sung**, and Bernd Burgstaller*
Korea Software Congress 2022 (한국정보과학회 학술발표논문집 2022): 45-47.

Lazy Evaluation of Kronecker Algebra Operations on the Tesla T4 GPU **2020**
*Ham, Seokhwan, **Hyunmo Sung**, Shinhyung Yang, and Bernd Burgstaller*
Korea Computer Congress 2020 (한국정보과학회 학술발표논문집 2020): 44-46.

Patent

프로세스 인 메모리의 활용을 위한 오프로드 처리 방법 및 그를 위한 장치
(Offloading methodology for utilizing Processing-In-Memory and the machine for it)
*Bernd Burgstaller, **Hyunmo Sung**, Seongho Jeong, Shinhyung Yang, Jayhwan Lee, and Jiun Jung.*
Application No. 10-2022-0162906, Nov 29 2022.

Project

Personal server management **March 2021 - Today**
Side project

- Run an Ubuntu server on Raspberry pi 4.
- Run a real time discord translator bot using PAPAGO and google translator APIs for two years in a server with 30k users.
- Developed a bot can search programming problem from a site and run a python code in a discord.
- - Restricted some functionality for security.
- - Supports input that reads input like standard inputs.
- Developed an automated youtube live/twitter space archiver that detects youtube live/twitter space from channels.
- Developed a video editor running with text file by ffmpeg with simple custom language.
- Developed a system that gets a log from network attached storage(NAS) and parses it to summarize user accesses.
- Developed an email notification system for server access and other projects.

Deapocalypse **March 2023 - Today**
Indie Game Development

- Factory building shooter game.
- Planed to sale on steam market.

Revist the Supernodal Floyd Warshall algorithm **November 2023 - December 2023**
Side project

- Implemented the Supernodal Floyd-Warshall algorithm from the paper https://dl.acm.org/doi/10.1145/3332466.3374533.
- 78 times fasters than a Floyd-Warshall algorithm with a single thread.
- 17 times fasters than a Floyd-Warshall algorithm with multiple threads with other optimization techniques.
- Utilized entire threads with OpenMP.
- Source is open on the github repository https://github.com/programelot/Supernodal-Floyd-Warshall.

Matrix multiplication on GPU **July 2022 - September 2022**
Side project

- Developed 11 matrix multiplication algorithms on CPU and GPU.
- Estimated and compared performance of each algorithms.
- Utilized the shared memory on GPU.
- Implemented Strassen's algorithm and Winograd's algorithm.
- Source is open on the github repository https://github.com/programelot/MatrixMultiplication.

BackRomii **July 2022**
Indie Game Development

- Developed an escape game from auto generated maze with first person view.
- - Used recursive divison method to generate maze.
- Optimized the game by developing an off culling algorithm.
- Developed a path finding algorithm.
- Developed in two weeks like game jam.
- Game has been released on the web. https://aintmos.itch.io/backromii

Research about PGO **September 2021 - February 2023**
Master's Thesis

- Developed a tool chain that does a profile-guided-optimization for processing-in-memory on the simulator.
- Developed a simple language that programmer can define offloading heuristic outside of the tool-chain.

Research about Kronecker algebra **September 2019 - December 2019**
Bachelor's Capstone project

- Evaluated kronecker algebra computation on the cloud environment.
- Received 1st price between other capstone projects

Projection based AR Evaction Simulator (PARES) **March 2019 - June 2019**
Bachelor's Capstone project

- Developed an AR evacuation simulator using a projector and the kinect.
- Received 1st price between other capstone projects

Teaching experience

- **Teaching assistant**
  - **Compiler Design (CSI4104-01)** **Autumn 2021, Autumn 2022**
    Yonsei University, Seoul, Korea
  - **Computer Programming (CAC1100-01)** **Spring 2022**
    Yonsei University, Seoul, Korea
  - **Computer Programming (CSI2100-01)** **Spring 2020, Spring 2021**
    Yonsei University, Seoul, Korea
  - **SW Programming (YCS1002-11/12/13)** **Spring 2021, Autumn 2021**
    Yonsei University, Seoul, Korea
  - **SW Programming (YCS1002-01)** **Winter 2020**
    Yonsei University, Seoul, Korea
  - **Computational Thinking and SW Programming (YCS1001-04)** **Autumn 2020**
    Yonsei University, Seoul, Korea

Awards

- **Capstone project 1st place (졸업 작품 최우수상)** **December 06, 2019**
  Lazy Parallel Kronecker Algebra, Yonsei University, Seoul, Korea
- **Capstone project 1st place (졸업 작품 최우수상)** **May 13, 2019**
  Projection-Based AR Evacuation Simulator using Kinect for Windows V2, Yonsei University, Seoul, Korea
- **Honored Student Prize (학기 우등생)** **July 09, 2015**
  Dongguk University, Seoul, Korea
- **Honored Student Prize (학기 우등생)** **January 09, 2015**
  Dongguk University, Seoul, Korea
- **Honored Student Prize (학기 우등생)** **July 07, 2014**
  Dongguk University, Seoul, Korea

Grant/Scholarship

- **Graduate Student Research Assistant (재학조교장학금)**, 3,416,000 KRW (about 2,729 USD)
  Yonsei University, Seoul, Korea, Winter 2021
- **Teaching Assistant scholarship (재학조교장학금)**, 1,800,000 KRW (about 1,438 USD)
  Yonsei University, Seoul, Korea, Winter 2021
- **Teaching Assistant scholarship (재학조교장학금)**, 1,800,000 KRW (about 1,438 USD)
  Yonsei University, Seoul, Korea, Spring 2021
- **Graduate Student Research Assistant (재학조교장학금)**, 3,625,000 KRW (about 2,896 USD)
  Yonsei University, Seoul, Korea, Spring 2021
- **Internal Scholarship (계절학기조교장학금)**, 748,000 KRW (about 598 USD)
  Yonsei University, Seoul, Korea, Winter 2020
- **Graduate Student Research Assistant (재학조교장학금)**, 3,416,000 KRW (about 2,729 USD)
  Yonsei University, Seoul, Korea, Autumn 2020
- **Teaching Assistant scholarship (재학조교장학금)**, 1,800,000 KRW (about 1,438 USD)
  Yonsei University, Seoul, Korea, Autumn 2020
- **Fund scholarship (고등교육혁신팀사회혁신활동장학금 (연구지원))**, 2,000,000 KRW (about 1,598 USD)
  Yonsei University, Seoul, Korea, Autumn 2020
- **Graduate Student Research Assistant (재학조교장학금)**, 3,416,000 KRW (about 2,729 USD)
  Yonsei University, Seoul, Korea, Spring 2020
- **Merit Scholarship(Academic) (성적우수장학 (학비감면))**, 1,374,000 KRW (about 1,098 USD)
  Dongguk University, Seoul, Korea, Autumn 2015
- **A-Grade (전공 (학과) 수석장학)**, 3,206,000 KRW (about 2,561 USD)
  Dongguk University, Seoul, Korea, Autumn 2014

Skills

Programming	C, C++, C#, CUDA, Python, PAPI, CMake, LLVM
Communication	Korean (native), English
Other	Unity, Visual studio code, Github, Linux(Ubuntu)