

Minsu Sun

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Education

POSTECH (Pohang University of Science and Technology)

Feb 2022 – Feb 2025

- B.S. in Computer Science and Engineering
- Awarded CSE Global Leadership Program scholarship(Sep 2023)
- Early graduation with 6 semesters out of 8 semesters

Skills

Programming Languages	C/C++, C#, Python, Java
Frameworks	Flask, FastAPI, BeautifulSoup4, Selenium
Tools	Git/Github, Docker, AWS, Kubernetes, Helm
Natural Languages	Korean(Native), English(Intermediate)

Experience

OMNIA Lab, POSTECH

Dec 2024 – Ongoing

Undergraduate Intern Researcher

- Advisor: Prof. Myeongjae Jeon

SHIFT UP

Jun 2024 – Aug 2024

Intern Backend Engineer, NIKKE

- Worked on:
 - Server side contents of collaborate minigame
 - Deploying and managing internal purposed infrastructures
- Skills: C#, Kubernetes, Helm

UnitCompany Inc.

Jun 2022 – Jun 2024

Part-time Backend Engineer

- Worked on educational service backend development
- Skills: Python, AWS, Docker

UnitCompany Inc.

May 2022 – Jun 2024

Intern Researcher

- Worked on research about recommendation system and LLM
- Topics:
 - BERT based contents recommendation system
 - LLM Fine-Tuning
 - LLM Prompt Engineering

Projects

Boosting RECOMP with DSLR

Oct 2024 – Dec 2024

- Adapting DSLR(Document Refinement with Sentence-Level Re-Ranking and Reconstruction to Enhance Retrieval-Augmented Generation) on RECOMP
- Individual research project adapting DSLR contextual reconstruction method in RECOMP(link)
- Achievement:

- Baseline Method(RECOMP) - EM: 0.163(NQ) / 0.300(TQA) / 0.186(HotpotQA)
- Proposed Method(RECOMP + DSLR) - EM: 0.172(NQ) / 0.312(TQA) / 0.194(HotpotQA)
- Advisor: Prof. Hwanjo Yu
- Topics: NLP, LLM, RAG(Retrieval Augmented Generation), RECOMP, DSLR

VC-GNN

Oct 2024 - Dec 2024

- Graph Neural Network for Solving Decision Variant of Vertex Cover Problem
- Team project adapting GNN on solving the decision variant of NP-Hard Problem, Vertex Cover Problem
- Achieved 92.76% of accuracy with 0.2002 of loss
- Topics: Deep Learning, Graph Neural Network

Distributed Arduino Calculator

Aug 2024

- Simple Distributed Computing Cluster with Arduinos via I^2C protocol
- Individual project simulating distributed 32bit floating point calculation(link)
- Distributed 32bit floating point(fp32) addition operations with 4 workers(Arduino Uno)
- Approximately took 10 seconds on 400K fp32 addition operations

Sponge

Mar 2024 - Jun 2024

- Educational TCP/IP Development Project Sponge
- Individual project implementing TCP/IP stack on Linux(link)
- Skills: C++
- Additionally implemented SHA256 hash calculation of every frame for debugging and verify purpose

BLARE

Mar 2024 - Jun 2024

- Blended FLARE(Forward-Looking Active Retrieval Augmented Generation)
- Individual research project proposing and implementing blended query formulation method in FLARE(link)
- Advisor: Prof. Hwanjo Yu
- Topics: NLP, LLM, RAG(Retrieval Augmented Generation), FLARE

RISC-V CPU

Mar 2024 - Jun 2024

- RISC-V 5-Stage Pipelined CPU with Configurable Cache
- Team project implementing RISC-V 5-Stage Pipelined CPU with Verilog(link)
- Features:
 - Pipelined 5-Stage Execution
 - 2-Bit Saturation Counter Branch Predictor with PHT(Prediction History Table) and BTB(Branch Target Buffer)
 - Multi-way configurable cache based on LRU

CUDA Based Parallel KNN Calculation

Dec 2023

- Optimizing naive KNN(K Nearest Neighbors) operation executed on CUDA
- Individual research project optimizing naive KNN operation on CUDA device
- Composed KNN operation as a combination of belows
 - Build euclidean distance matrix of given points in the manner of matrix multiplication using tiling
 - Sort distances of neighbors using thrust::sort and select K neighbors
- Achievement compared to naive baseline code:
 - Calculating distances: about 28 times faster execution time
 - Sorting distances: about 11 times faster execution time

B-CARAFE

Nov 2023 - Dec 2023

- Better CARAFE(Content-Aware ReAssembly of FEatures)
- Individual research project proposing and implementing better reassembly methods
- Proposed new reassembly methods with activation functions attached on original reassembly module

- Achievement:
 - Original CARAFE++(Faster R-CNN, ResNet-50) - AP: 22.5 fps: 12.54
 - Proposed B-CARAFE(Faster R-CNN + GELU, ResNet-50) - AP: 23.7 fps: 13.25
- Full report about the research(link)
- Topics: Computer Vision, Image Segmentation, CARAFE(Content-Aware ReAssembly of FEatures)

MDEditor

Oct 2023 – Dec 2023

- Intellij Real-time Markdown Editor Plugin
- Team project developing Intellij plugin(link)
- Developed based on Agile Software Development and Test Driven-Development
- Skills: Java, Git/GitHub
- Main Role: Developer, QA

PintOS

Sep 2023 – Dec 2023

- Educational OS From Stanford CS140
- Individual project developing PintOS(link)
- Skills: C
- Worked on Threading, User Program, Virtual Memory

BaroKey

Oct 2023

- Barokey, Direct Local Keyword for Our Safety
- Team project developing web service(link) introduced at 3rd UniThon Hackathon Track
- Web service supplying user real-time emergency-related issue keywords near user's location
- Skills: Python(FastAPI, BeautifulSoup4, Selenium), AWS EC2
- Main Role: Backend Developer

Arduino MIDI Controller

May 2023 – Jun 2023

- Arduino MIDI Controller for Musical Keyboard
- Individual project implementing MIDI controller for musical keyboard
- MIDI Controller based on Arduino Leonardo with shift registers and matrix-ed switches

RISC-V SRNPU

Mar 2023 – Jun 2023

- RISC-V Based Super Resolution Neural Processing Unit
- Individual project implementing SRNPU with Verilog
- Hardware accelerator dedicated to generate super resolution image based on CNN model
- Processed 128x128 image *under 4ms* with 3 layers Sim-ESPCN CNN model
- Processed 128x128 image *under 10ms* with 8 layers SSAI 2021 CNN model

Online Judge Backend

Jul 2022

- Dedicated Online Judge System
- Individual project supplying online judge system application to a company
- Online judge system backend based on Qingdao University's seccomp judger library
- Skills: Python, Docker, AWS SQS