Shinwoo Kim

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Education

University of Pittsburgh

M.S. in Computer Science GPA: 4.0/4.0 Dec. 2024

B.S. in Computer Science, with Honors Distinction GPA: 3.9/4.0 Dec. 2023

Relevant Coursework

- Software Quality Assurance, Algorithm Design, High Performance Computing
- Operating Systems, Database Systems, Distributed Systems, Wide Area Networks
- Computer Organization, Computer Architecture, Compiler Design
- Machine Learning, Artificial Intelligence, Data Mining, Mathematical Analysis

Experience

Sergeant / Intelligence Systems Operations Specialist Mar. 2025 – Sep. 2026

Republic of Korea Army (Korea Defense Intelligence Command) *South Korea*

- Maintained and operated mission-critical infrastructure, including servers, data communications systems, and databases, supporting military strategic C4I operations. Provided on-call support and troubleshot system crashes and operational issues to maintain 24/7 system availability and operational continuity.

Part-Time Instructor / Teaching Assistant Jan. 2022 – Dec. 2024

University of Pittsburgh (Department of Computer Science) *Pittsburgh, PA*

- Led recitations in two core-level required courses (*System Software & Discrete Structures*) to over 400 undergraduate students.
- Designed various course materials (assignments, handouts) using x86 assembly and the C programming language.
- Provided comprehensive one-on-one academic support to students in office hours; performed grading duties.

Software Engineering Intern May 2024 – Aug. 2024

Ansys Inc. (Digital Twins Team) *Pittsburgh, PA*

- Enhanced Azure DevOps CI/CD infrastructure to automate publishing of nightly builds for Ansys Twin AI while adding support for generating and collecting test coverage reports improving code quality.
- Wrote a containerized Python scripting library for reduced order model creation and deployment workflows, allowing customers to integrate TwinAI with other Ansys products and headless execution pipelines.
- Designed a tool for automatically generating CycloneDx Software Bill of Materials for C++ packages, satisfying government regulations for secure software requirements.

Projects

GRASP-HPO: Hyperparameter Optimization using Greedy Randomized Adaptive Search Procedure

- Implemented a novel algorithm for finding optimal hyperparameters (GRASP) for machine learning in Python, and compared its performance against other hyperparemeter optimization algorithms in a real-world scenario of electrical substation intrusion detection systems. (Supervised by Prof. Daniel Mosse).
- Technologies Used: *Python, scikit-learn, Ray, BOHB, HyperBand, HyperOpt.*

Adaptive Speculative Decoding: Improving Large Language Model Performance.

- Developed an adaptive framework to speed-up Large Language Model (LLM) inference by dynamically selecting an appropriate draft model for efficient speculative decoding. (Supervised by Prof. Stephen Lee)
- Technologies Used: *Python, Transformers, PyTorch, CUDA.*

Distributed Crash-Tolerant Key-Value Datastore using Consensus-based Protocols.

- Designed an implemented a distributed, fault-tolerant data store server which manages replicas using either an automated leader-election, or leaderless quorum mechanism.
- Technologies Used: *Python, Zookeeper, gRPC, Kazoo, Docker.*

Technical Skills

Languages: C, C++, Java, Python, R, JavaScript, Golang
Frameworks: Flask, Node.js, React, gRPC, Docker
Version Control: Git, GitHub, Azure DevOps
Data: PostgreSQL, Pandas, R Tidyverse, GGPlot
AI/ML: PyTorch, Scikit-learn, Ray, Transformers
Software Engineering: JUnit, Selenium, Valgrind