

# SHINWOO KIM

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## EDUCATION

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**Master of Computer Science**, University of Pittsburgh Expected December 2024 (GPA: 3.9/4.0)  
**Bachelor of Computer Science**, University of Pittsburgh 2021 – 2023 (GPA: 3.9/4.0)

### Relevant Coursework

Operating Systems	Compiler Design	Machine Learning	Data Mining
Distributed Systems	Computer Architecture	Algorithm Design	Honors Linear Algebra
Database Systems	Computer Organization	Software Quality Assurance	Honors Mathematical Analysis

## EXPERIENCE

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### Teaching Assistant

*CS0449: System Software & CS0441: Discrete Structures* Aug 2022 - Present  
Department of Computer Science, University of Pittsburgh *Pittsburgh, PA*

- Teach core topics in systems programming and discrete structures to a recitation with more than 30 students.
- Develop various course materials using x86 assembly and the C programming language.
- Provide comprehensive one-on-one academic support to students in office hours.

### Software Developer

Swigonova Lab, University of Pittsburgh March 2022 - Present  
*Pittsburgh, PA*

- Created a free and open-source library of various 3D macro-molecular models to be used in the classroom.
- Using various open-source libraries and tools, created the front-end for the web page that displays each model and accompanying information sheet in the browser (<https://touchtheinvisible.com>)
- Created a easy-to-use Content Management System that allows non-technical lab members to easily manage assets and edit the website.

## PROJECTS

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

Working with Dr. Daniel Mosse and Dr. Silvio Quincozes, created a novel algorithm for hyperparameter optimization for use in various Machine Learning applications such as in XGBoost. After implementing, created benchmarks of GRASP-HPO by comparing it to other HPO algorithms in a real-world scenario of intrusion detection systems (IDS).

Technologies Used: *Python, scikit-learn, Ray, BOHB, HyperBand, HyperOpt*

### Distributed Key-Value Store.

Using gRPC, Zookeeper, and Kazoo, implemented a distributed data store server which can manage replicas using either an automated leader-election mechanism, or a leader-less quorum mechanism.

Technologies Used: *Python, Zookeeper, gRPC, Kazoo, Docker*

### Mini-Java Compiler.

Wrote a compiler for a modified Java language that targets the MIPS 2000 assembly language. The compiler consists of a lexical analyzer, a parser (which contains syntax and semantic analyzers), and an assembly code generator.

Technologies Used: *C, Flex, Yacc, Bison*

### BeSocial: The Pitt SNS.

Created a database back-end for a social networking system with various server-side functions; and a proof-of-concept front-end interface to demonstrate functionality and ensure concurrency testing.

Technologies Used: *PostgreSQL, Java, JDBC*

## SKILLS & LANGUAGES

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- **Languages:** Java, C, Python, R, JavaScript, Ruby, X86, MIPS, RISC-V, SQL, Postgres, Proto
- **Tools & Frameworks:** Git, Trello, Flask, React, NodeJS, Tailwind, Tidyverse (R), gRPC, Jupyter, Docker, scikit-learn, Keras, Ray, GDB, Valgrind, JUnit, Selenium, Google Sanitizers, Java Pathfinder, VisualVM