Ziyu (William) Li

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Education

Purdue University West Lafayette, IN/USA

B.S. in dual majors: Computer Science/Data Science *GPA:3.99 / May 2025*

- Concentrations: Systems Software, Security, Machine Intelligence
- Major Courses: Computer Networks, Compilers, Operating Systems, Analysis of Algorithms, Intro To Cryptography, Computer Security, Machine Learning, Intro to Artificial Intelligence, Time Series, Object Oriented Programming

Internships

Research Intern May 2024 - Oct 2024

Reliable and Secure Systems Lab at Purdue *West Lafayette, IN/US*

- Developed an optimized snapshot/restore mechanism in C++ for llvm libfuzzer, utilizing Linux kernel's soft-dirty page tables to track memory changes efficiently, leading to a 40% increase in fuzzing throughput.
- Implemented an IR-level LLVM pass to instrument the store of global variables, improving the ability to monitor and analyze program states for state-exploration algorithms.
- Designed a Python script to automate the linkage of benchmark testing programs, reducing build time by 60%.

Project Assistant Jun 2023 - Aug 2023

Shanghai Minghua Electric Power Science & Technology Co. Ltd. *Shanghai, CN*

- Developed a Digital Twin model using Python and MATLAB, achieving over 95% simulation accuracy, which enabled precise energy flow analysis and informed critical decision-making on component adjustments.
- Created a power dispatch optimization system using genetic algorithms to dynamically adjust generator operations, resulting in a 20% reduction in power consumption.

Quantitative Developer Intern May 2022 - Aug 2022

Nipun Capital, L.P. *Foster City, CA/US*

- Designed an automated Python script for scraping financial data from 14 distinct sources, subsequently storing the aggregated information in a Google Cloud database.
- Migrated 50 production scripts to newer versions, as well as fixing legacy bugs and enhancing the codebase's overall compatibility.
- Monitored, debugged, and optimized Airflow jobs, reducing task failures by 15% and improving execution time.

Projects

Compiler for C | *C++/LLVM* Aug 2024 - Dec 2024

- Developed a recursive descent parser to convert C code into an abstract syntax tree, facilitating efficient IR lowering and enabling advanced optimizations.
- Performed the liveness analysis on LLVM IR and removed redundant IR codes, reducing the code size and execution time by 20%.
- Converted the abstract syntax tree to Static Single Assignment form by implementing Braun's algorithm.

XINU Operating System | *C/x86 Assembly* Feb 2024 - May 2024

- Transitioned the original fixed-priority scheduling policy to a multilevel feedback queue, reducing the response times of IO-bound processes by 10x.
- Implemented a resource graph based on Banker's algorithm to detect deadlocks in advance, mitigating potential synchronization errors.
- Developed a garbage collection system that reclaims allocated memory when it is no longer needed, effectively reducing memory waste by 15%.

Technical Skills and Language

Programming: C, C++, x86 Assembly, Java, Python, Swift, Linux, R, SQL, HTML, CSS, JavaScript
Tools: GCC, GDB, GIT, Vscode, IntelliJ, Pycharm
Libraries: LLVM, HDFS, Spark, Pytorch, Pandas, Numpy, Matplotlib, ggplot
Language: English(Fluent), Chinese(Fluent)