Madhav Valiyaparambil

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Education

Purdue University, West Lafayette, IN August 2023 – May 2027

B.S. in Computer Science Honors; Board Memeber, CS Undergraduate Student Board *GPA: 4.0/4.0*

- **Coursework:** Randomized Algorithms, Computer Architecture, Systems Programming, Operating Systems, Data Sructures, Databases, Object-Oriented Programming, Competitive Programming
- **Awards:** National Merit Scholar, Dean's List, Semester Honors

Experience

Software Developer Intern May 2025 – August 2025

Farmers Mutual Hail *Des Moines, IA*

- Automated the generation and mailing of over **2,000** letters regarding 1099 Tax Forms using **Java**, reducing manual effort by **90%** and accelerating delivery timelines by **30%**
- Retrieved information for letters through various **Oracle SQL** tables with **Hibernate**
- Leveraged the **Adobe Document Generation API** to generate letters based on a custom DTO that corresponds to an **XDP** created with **Adobe Designer**
- Applied **OOP** principles to develop readable, understandable, and extensible code
- Collaborated in **daily standups** and implemented **Agile** workflow through a team **Kanban** Board
- Boosted **CI/CD** pipeline stability by writing and enhancing **unit tests**, maintaining **85%** code coverage on committed code.

Algorithms Lead August 2024 – Present

Sphero Swarm Project - Purdue Autonomous Robots Club *West Lafayette, IN*

- Leading a team that works in **Python** to calculate and send movement directions in real time for multiple **Sphero BOLT**s in order to create an interactive simulation of step-growth polymerization
- Optimizing decision-making logic, enabling the algorithm to support calculations for **200%** more Spheros
- Developing virtual simulations in **Pygame** to evaluate new movement strategies and reduce trial-and-error on hardware.

Undergraduate Teaching Assistant August 2024 – Present

Systems Programming, Analysis of Algorithms - Purdue University *West Lafayette, IN*

- Educating over **300** students on the fundamentals of networks (**TCP/IP**, **DNS**, **DHCP**, and **SMTP**)
- Guiding students on complex projects, such as custom memory allocators and multi-threaded servers on **Linux**
- Holding weekly office hours with around **30** students, improving project completion rates and student confidence
- Creating course material and leading sessions on topics such as asymptotic analysis, divide and conquer, and dynamic programming

Projects

Mash | *Lex, Yacc, C++* March 2025 – May 2025

- Developed a fully functional, memory safe, shell interpreter that can be used as a Bash replacement
- Features include wildcarding, running subshells, command piping, io redirection, process substitution, environment variable expansion, background processing, and line editing

Simple C Compiler | *Lex, Yacc, C++, x86-64 Assembly* August 2024 – December 2024

- Created a one-pass compiler that translates a subset of the **C** language into **x86-64 Assembly**
- Support for control flow, local and global variables, functions, and pointers

Transverse Field Ising Model Simulation | *Python, Qiskit* August 2023 – May 2024

- Worked with a team of graduate strudents to build a quantum circuit simulating a Transverse Field Ising Model to collect information on particle spins throughout the simulation, compiled a dataset of over **200,000** spins
- Visualized this dataset through a timelapse of spin position graphs using **Matplotlib**

Byte Bazaar | *Java, JUnit* September 2023 – December 2023

- Collaborated with 4 teammates to create a desktop marketplace application with client-server functionality, concurrency support for multiple users, and data permanence with a centralized file system

Technical Skills

Languages: Java, C/C++, Python, SQL, x86-64 Assembly, ARM, Bash, C#, JavaScript, TypeScript, HTML/CSS
Tools: Toad, GitHub, GDB, Vim, Splunk, IntelliJ, Jupyter Notebook, Perforce, JAMS, AEM, Rally, QuickBuild
Frameworks: WordPress, Qiskit, JUnit, Spring Boot, Hibernate