Prem Chintalapudi

premc@mit.edu | 925-216-1580 | https://pchintalapudi.github.io/

Education

- Massachusetts Institute of Technology (MIT) (4.9/5 GPA) .
  - BS Computer Science & Engineering + Bioengineering (February 2022)
  - MEng Electrical Engineering and Computer Science (May 2023)

Courses

Software Design and Engineering	Computer Architecture	Introduction to Machine Learning
Performance Engineering	Introduction to Embedded Systems	Probability and Random Variables
Design and Analysis of Algorithms & Data Structures	Computer Systems Engineering	Computational Systems Biology

Work Experience

JuliaLab — March 2021 –Present

Undergraduate Researcher

- Worked on Julia compiler written in C++ and LLVM to improve allocation optimization around PHI nodes
- Added automatic bounds checking elimination to the Julia language
- Updated the code generator to avoid emitting unnecessary instructions, hoisting allocations and write barriers out of loops
- Taught the compiler to hoist allocations out of specific branch idioms.
- Currently adding support for escape analysis for array allocations and hoisting allocations out of loops

NVIDIA Corporation — June 2021 – August 2021

Computer Architecture Intern — Computation Modeling

- Designed and built replay system for GPU architecture model in C++ to speed up debugging and testing
- Developed a low-cost extensible method of autogenerating serialization methods
  - Used functional-style template metaprogramming to provide clean serialization API
- Designed the software
  - to incrementally compress saved data to optimize memory and disk usage.
  - to save sufficient data to replicate segmentation faults and other signal-based program crashes
- Built web-based interface to visualize and aggregate intermediate replay data
- Developed several tools to aggregate statistics on the flow of packets into and out of GPU units

Doc.ai — January 2021 – February 2021

Software Engineering Intern

- Digital IRB Clinical Protocol Parsing
  - Developed program in Python to parse clinical trial protocol PDFs using pdfminer.six into a document tree
  - Used spacy.io's natural language functionality to classify the nodes of the document tree as different sections of the protocol

- Built significant sections of frontend and backend web app harnessing GPT-3 text summarization capabilities to produce study summaries for clinical trials

McAfee, LLC May 2020 – August 2020

Software Engineering Cloud Security Intern Cloud Security BU Engineering

- Connected Apps Security
  - Added controls to endpoints to prevent unauthorized access to resources using Spring Security
  - Implemented new REST endpoints for aggregating and normalizing data for chart display
  - Developed automation test suite for UI components using Cypress to test application loading, access control, and application base load time

Sandia National Laboratories (CA) June 2019 – August 2019

Undergraduate Summer Intern R&D

- Investigated antibacterial properties of mesenchymal stromal cells using CRISPRa/CRISPRi
- Performed bacterial work (Cloning, Minipreps, Maxipreps), cell lines + bacterial co-culture assays

Personal Projects

Mini Virtual Machine *C++* (June 2020 – March 2021)

- Bytecode interpreter modeled similarly to the JVM, written in C++
- Garbage collection, virtual memory allocation/deallocation, template metaprogramming
- Associated bytecode compiler written in C++ (tokenizing, parsing, compiling)

Course Planner *Vue/Typescript* (December 2019 – January 2020)

- Graphical and responsive planning of courses using web technologies; intuitive user interface
- Rendering pipeline optimization, CSS animation/transitions

Skills

- C++, Python, Java, Typescript, Javascript, Bash, SQL, HTML, CSS, SVG, Cypress, Spring Boot, Vue, LLVM, Git, Subversion, Perforce