Rohith Suresh

Software Developer

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Profiles

 Github　 Twitter　 Website
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Summary

- Specializes in **web** and **systems** programming. - Interested in **compiler construction**, **operating systems** and **low level software**

Skills

Javascript	**Typescript**
Strong	Intermediate
Go	**C**
Intermediate	Intermediate
Rust	**SQL(Postgres)**
Beginner	Intermediate
Git	**Linux/Shell**
Intermediate	Intermediate
C++	**Python**
Beginner	Strong

Experience

Oracle
May 2023 - July 2023

Software Developer Internship

🔗 https://www.oracle.com/

- Worked on porting an **Instruction Trace Monitor** to the **Linux Aarch 64** platform
- Designed **handy abstractions** on top of the **Ptrace** systemcall for the Linux ABI to enhance portability between different platforms.
- Implemented a **CLI interface** to observe the diff between instructions for different executables in an html file.

Awards

Hackathon Winner: Techsoc 2022
Techsoc IIT Madras
September 2022

https://techsoc.iitm.ac.in/halloffame/cl85z34d811e40bpifrj08o9e

App for my Institute(AMI) challenge
IIT Madras

Part of a three member winning team for the Security application challenge by the Director, IIT Madras

Education

Indian Institute Of Technology, Madras
October 2020 - Present
Dual Degree(BTech + MTech)

Electrical Engineering
CGPA: 8.36

🔗 https://www.iitm.ac.in

Research

MLIR compiler for Deep Learning Accelerator
October 2023 - Present

Shakti lab IITM

🔗 https://shakti.org.in/

- Developing a software pipeline for the deep learning accelerator Shaktimaan.
- Actively developing an MLIR to C transpiler to execute neural network inference on the accelerator.
- Developing a web app to aid remote development of software on the FPGA

Volunteering

E-Cell IIT Madras
April 2022 - April 2023

Core, Web and Mobile Operations

🔗 https://ecell.iitm.ac.in

- Nominated by the Dean of Students, IITM to lead a 15+ membered team of developers
- Managed the Internfair portal project which connected 90+ startups to 900+ students
- Ideated the software architecture and frontend design of 7+ full stack portals along with continous deployment via Github webhooks

Projects

Lisp Compiler
A cross platform lisp compiler built with an LLVM backend in Golang with zero dependencies.
🔗 https://github.com/RS2007/Lisp-compiler

- Implemented a handwritten **lexer** and **parser** for Lisp style S Expressions.
- Implemented a **code generator** that emits **LLVM IR**.
- Supports **function calls**, **If expressions** and **arithmetic and comparision** operators.
- An **interpret** and **compile mode** that a user can select via a CLI option
- Support for calling the write system call on *Linux x86 platform*

Tree Walking Interpreter
A tree walking interpreter for a Turing complete programming language in ANSI C with no dependencies
🔗 https://github.com/RS2007/compiler-for-monkey

- Functional interpreter with support for:
    - **Function calls**, **Operator precedence**, **Closures** and **Higher order functions**
    - Primitive data types like **strings**, **booleans**, **integers**, **arrays** and **hashmap** and builtin methods for the same
- Read-Eval-Print Loop (**REPL**) functionality and **unit tests** to enable rapid prototyping
- Handwritten **Lexer**, **Recursive descent parser** , **Evaluator** and **Reference counted garbage collector**.

RISC-V 32 bit CPU
A CPU core written in Verilog for the RV32I ISA
🔗 https://github.com/RS2007/single-cycle-cpu

- Supports the **RV32I** instruction set and synthesized on a **PYNQ Z1** FPGA at a clock speed of **150MHz**
- Wrote a **software emulator** for the RV32I ISA in **Rust** accompanying the FPGA implementation.
    - Github link

LLVM Compiler
A feature rich compiler that leverages the LLVM C++ API
🔗 https://github.com/RS2007/LLVM-compiler

- Support for object oriented programming with **classes** and **inheritance**.
- Garbage collection for heap allocated objects using [lib-gc](lib-gc)
- Support for higher order functions, **functors** and **lambda expressions**.
- Support for **for** and **while** loops, **if** statements and **operator precedence**.