Ruban S

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Work Experience

MIPS EMBEDDED TECHNOLOGIES PVT. LTD. | Associate Engineer
Jan '23 – Jun '23 (Intern)
Jul '23 – Current (Associate Engineer)

- Part of the **CPU Architecture and Performance Team**. Worked on the **P8700** out-of-order RISC-V CPU. Currently working on the **I8500** in-order RISC-V CPU.
- Played a significant role in **fine-tuning** the **branch predictor** for the P8700, achieving a **98% accuracy** in Coremark
- **Diagnosing performance bottlenecks** in the CPU microarchitecture using industry-standard **EDA tools** and proposed solutions.
- Created and **correlated** a performance model for **L1 and L2 Prefetchers** using **C++**, and additionally tuned the L1 Prefetcher to provide an overall **12% increase in SPECint score**
- Performing **correlation** between RTL simulation output and performance model output to match the **microarchitectural implementation of the performance model** to RTL design
- Developing **performance analyzing tools and scripts** using **Python** and **Shell**, to extract and process performance events and information, which are used to visualize the CPU performance.
- Developing **microbenchmarks** in **C** and **RISC-V assembly** to stress-test and assess the performance of various CPU blocks

TEACHING ASSISTANT IN COMPUTER ARCHITECTURE | BITS Pilani
Semester I 2022-23
Dept. of Computer Science and Information Systems, BITS Pilani Hyderabad Campus

- Provided support to students during **MIPS Assembly** lab sessions.
- Set problems and solutions for lab exercises and the final lab exam.

Projects

CYCLE-ACCURATE RISC-V PERFORMANCE SIMULATOR

- This project is a cycle-accurate microarchitecture implementation of a simple in-order superscalar RISC-V CPU in C++
- Built on top of Spike, an open-source RISC-V Instruction Simulator
- Currently Work in Progress Github Repository

MARR'S LEVELS IN A MICROPROCESSOR MODEL OF THE BRAIN | BITS Pilani

- An attempt to reverse-engineer the 6502 microprocessor by comparing it's functionality to that of the human brain.
- Studied the 6502 at the transistor level of implementation.
- Github Repository

Certifications

ORACLE CLOUD INFRASTRUCTURE FOUNDATIONS 2020 CERTIFIED ASSOCIATE | Oracle

- The OCI Foundations certification is intended for individuals looking to demonstrate knowledge of public cloud services.
- Mastered cloud technology, OCI services such as Compute, Storage, Network, OCI pricing and QoS.

Skills

- **Computer Architecture** (Experienced)
- **Performance Modelling** (Experienced)

PROGRAMMING

- **C** (Experienced)
- **C++** (Experienced)
- **Python** (Experienced)
- **RISC-V Assembly** (Experienced)
- **Shell Scripting** (Experienced)
- **Verilog** (Amateur)

TOOLS/PLATFORMS

- **Windows** (Experienced)
- **Linux** (Experienced)
- **Git** (Skilled)
- **Perforce** (Experienced)
- **Synopsys VCS** (Experienced)
- **Jira** (Experienced)
- **Jenkins** (Intermediate)

Education

BITS PILANI, HYDERABAD CAMPUS
B.E. Computer Science
2019 - 2023
CGPA: 9.01 / 10

BISHOP COTTON BOYS' SCHOOL
Science Stream (Class XII)
2019
Score: 93.80%

BISHOP COTTON BOYS' SCHOOL
Science Stream (Class X)
2017
Score: 91.67%

Languages

- English (Proficient)
- Hindi (Intermediate)
- Tamil (Intermediate)