Pranav Dani

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EDUCATION

SUNY – Stony Brook University Aug 2023 - May 2025
Master of Science, Computer Science *New York, USA*
- Courses: Computer Architecture, OS, Distributed Systems, System Security, Theory of Databases, Analaysis of Algorithms
- Teaching Assistant: Fundamentals of Software Development

University of Mumbai – Thadomal Shahani Engineering College Aug 2019 - May 2023
Bachelor of Engineering, Information Technology *Mumbai, India*
- Courses: Computer Architecture, OS, DBMS, DSA, Computer Networks, Network Security, Data Mining

EXPERIENCE

GRA: GPU and CPU Profiling - Advisor: Prof. Dongyoon Lee May 2024 – Present
Energy Flamegraphs *New York, US*
- Built a CPU Energy Flamegraph tool using Linux perf_events and PowerAPI to monitor power consumption per function call.
- Developed a GPU Energy Flamegraph tool using CUPTI and NVML to monitor GPU power consumption per kernel.

Software Intern Jun 2021 – Aug 2021
Suven Consultants *Mumbai, India*
- Developed a Home Inventory and Loan Management tool using Java and SQLite3; gained 150+ active users in the first month.
- Integrated Printable interface to generate PDF reports using Java AWT and Graphics Library, enhancing document accessibility.

SKILLS

Languages: C, C++, Verilog, Java, Python
Databases: PostgreSQL, MySQL, MongoDB
Web: React.js, Node.js, Flask, HTML, CSS, JS

Tools: QEMU, Perl, Bash, GTKWave, Git
Platforms: GitHub, Firebase, Heroku, Unix, Linux
CI/CD: GitHub Actions, Docker

PROJECTS AND RESEARCH

RISC-V CPU - RV64IM | *Verilog, GTKWave, C* Jun 2024 – Nov 2024
- Designed a five + stage in-order pipeline for RV64IM spec extension which talks to the physical memory over **AXI4 protocol**.
- Implemented an ALU to execute instructions, and interact with reg file, supporting pipeline stalls on RAW data hazards.
- Added branch prediction, Set-Associative cache, and support for load/stores and ECALL instructions with pipeline flush.

Improved xv6 File System | *C, QEMU* Mar 2024 – May 2024
- Built a disk logging protocol targetting in-memory buffers and disk writes, reducing disk write latency by 94%.
- Added small file support with file type conversion, optimizing disk space utilization and reducing disk I/O significantly.
- Implemented *ftruncate()* syscall for file truncation and automatic transition between "small" and regular files.

Raft Implementation - Consensus Algorithm | *C++* Aug 2023 – Dec 2023
- Built a persistent key-value store using Raft for leader election and data replication. Implemented snapshotting.
- Implemented sharding with consistent hashing for efficient data distribution and automated partition rebalancing.
- Developed a versioned key-value store that supports cross-shard transactions using 2-Phase Locking and 2-Phase Commit with Optimistic Concurrency Control.

BackGen - GoLang Backend Generator | *ICT4SD* | *Springer* Jan 2023 - Aug 2023
- Developed a software tool that helps with the process of writing repetitive backend code for web applications.
- Creates data models and RESTful API endpoints, and generates executable code for the same in Golang.
- Generates approximately 48% of the code. (Result evaluated for creating a backend for a simple Todo application.)

Expense Tracker | *Flask, PostgreSQL, Heroku, HTML, CSS, JS* | GitHub Apr 2021 – Jun 2021
- Built a web app for managing personal expenses with bulk expense creation and data export in CSV/Excel formats. Gained 100+ users in the first month.
- Enabled personalized budget creation across multiple categories, enhancing flexibility in expense tracking.

EXTRACURRICULAR ACTIVITY

Our Tech Community (OTC) | ourtech.community | *Admin* May 2022 - Present
- Hosted 300+ hours of weekly OTC CatchUp technical discussions, organized two in-person MeetUp events with 60+ attendees.