SHIVAM MAHESH POTDAR

Computer Architecture and Digital Design Enthusiast

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EXPERIENCE

Indian Institute of Science (IISc), Bengaluru

Research Assistant, Computer Aided Design Lab

Jun '20 -Present Guide : Prof. S K Nandy

For undergraduate thesis, project in the area of Machine Learning Acceleration tool-chain and hardware for REDEFINE, a massively parallel and re-configurable silicon core technology.

Free and Open Source Silicon (FOSSi) Foundation

Student Developer (Under Google Summer of Code (GSoC) 2020)

May '20 -Present Mentors : Steve Hoover, Jonathan Balkind

Working on the project titled "Integration of WARP-V with OpenPiton". WARP-V is a highly parameterised and configurable CPU core written in the upcoming TL-Verilog standard and OpenPiton is Princeton Parallel Group's highly scalable manycore framework. (Funded by Google)

Dept of Computer Science and Engineering, IIT Bombay

Project Intern, Smart Energy Informatics Lab

Jul '19 - Jun '20 Guide : Dr. Mahesh Parihar

Implementation of an IoT based Smart Brown Box for smart power distribution management to prevent blackouts, and convert them to brownouts. Implemented on NodeMCU using various sensors.

Department of Electrical Engineering, IIT Bombay

Summer Research Intern, Wadhwani Electronics Lab

May '19 - Jul '19 Guide : Prof. Shabbir Merchant

Construction, verification and testing of digital circuits on Altera MAX V based PLD using VHDL.

PROJECTS

Security System in Verilog

May '20 - Jun '20 Details

- Verilog module for phone keypad scanner, and controller with FSM, ROM and RAM.

8-bit Micro-controller implementation on FPGA

Aug '19 - Feb '20 Details

- Starting with basic building blocks of an MCU viz ALU, registers, RAM etc., add features incrementally.
- VHDL, FPGA, Computer Architecture

Balancing Bot

Dec '19 - Feb '20 Details

- Biped balancing bot with LQR controller, for e-Yantra Robotics Competition (IITB) 2020
- Embedded Systems, PCB Design, Control Systems

EDUCATION

B. Tech. in Electrical and Electronics Engineering

National Institute of Technology, Karnataka, Surathkal

April 2021 8.59 CGPA

Class 12^{th} (CBSE)

Kendriya Vidyalaya, VSN, Nagpur

May 2017 97.6%

Class 10^{th} (CBSE)

Kendriya Vidyalaya, 9BRD AFS, Pune

May 2015 10 CGPA

AREAS OF INTEREST

Computer Architecture | RISC-V | CPU Design and Verification | FPGA / ASIC Design and Verification | RTL Design | Open-Source Tools | Hardware for ML Acceleration and HPC

SKILLS & TOOLS

(System)Verilog / VHDL | Python | Bash Shell | Linux OS | C/C++ | Xilinx Vivado / ISE | Intel Quartus Prime | RISC Assembly | Embedded C | RPi/AVR/ESP/TI MSPs | SPICE | Tensorflow | MATLAB | Simulink

PUBLICATIONS

- **Shivam Potdar**, Steve Hoover, Jonathan Balkind (July 2020). *"Poster: Flexible Manycore CPU Design with TL-Verilog"*. Design Automation Conference (DAC) 2020
- **Shivam Mahesh Potdar**, Vanshika Gupta, Pruthviraj Umesh and K V Gangadharan (Jan 2020) : *"Conceptualization and Design of Remotely Accessible Hardware Interface (RAHI) Laboratory"*, FICTA 2020, Springer AISC Series

Remote-Triggered Hardware Learning Platform

Jan '19 - Apr '19 Details

- Project for the RT-Labs, Centre for System Design, NITK
- Platform for students to learn Python coding for electronics with Raspberry Pi on actual device with visual feedback without the need of physical access to the device.
- RPi, Django2, Python

Thirsty Crow Robot

Dec '18 - Feb '19 Details

- For e-Yantra Robotics Competition 2018, IIT Bombay
- Line following bot with path planning on hexagonal grid arena with OpenGL animations of the movement using Aruco markers
- ATMEGA2560, OpenGL, OpenCV, PCB Design, Path Planning

Cloud Tracking using Satellite Imagery

Jan '19 - Apr '19 Details

- Mini Project with Dr Yashwant Kashyap, EEE Department, NITK
- Processing of coloured and cloud optical thickness satellite imagery over a time period and predicting the movement of clouds
- MATLAB, SVM classification, Image processing

Remotely Monitored Weather and Intrusion Detection

Jun '18 - Jul '18 Details

- Collecting data from temperature and humidity sensor and PIR sensor (intrusion), and publishing it to a website
- Arduino, ESP8266, digital sensors interfacing, basic web development, HTTP requests, serial communication, ThingSpeak API, AT commands

ACTIVITIES

- Talk on Open ISAs & Hardware, OpenPOWER Community (India), July 2020
- Introductory Talk on Embedded Systems, IoT and Computer Architecture for NITK Juniors, May '20
- Talk on Research Internships for NITK Juniors, October '19
- Mentored 30 first year students of NITK in Embedded Systems and IoT, Summer of '19
- Community Member, RISC-V International
- Computer Architecture and Embedded Systems Interest Group Head, ACM NITK
- Student Coordinator, Embedded Systems and Robotics Lab at NITK (e-Yantra Lab Setup Initiative, IIT Bombay)
- Executive Member, ACM Student Chapter and Flying and Robotics Club
- Product Manager, IRIS NITK

ACHIEVEMENTS

Google Summer of Code, 2020
$3000 stipend from Google for open-source development for FOSSi Foundation

A Richard Newton Young Fellow
57th Design and Automation Conference (DAC), July 2020

Student Fellow
4th IEEE International Test Conference (ITC) India, July 2020

Winner, Coding Hackathon 2k18
Organised by IoT Club, NMAMIT Nitte. Won a cash prize of ₹10000

Nagpur District Topper, CBSE Class 12^{th}
97.6%. Top 1.5% all over India. First Rank in KV Sangathan Jabalpur Region, ₹5000 cash prize from CBSE

Represented Kendriya Vidyalaya Sangathan at JNNSMEE-2016
National Level Science Exhibition organised by NCERT at BIEC Bengaluru, Dec. 2016

RELEVANT COURSES

- Pipelining RISC-V with Transaction-Level Verilog, Udemy
- Developing HPC Accelerators using Xilinx FPGAs, ICS2020
- Computer Organisation and Architecture, NITK (CSE)
- VLSI Design, NITK (ECE)
- Digital System Design, NITK (EEE)
- Microprocessors, NITK (EEE)
- Embedded System Design, NITK (ECE)
- Machine Learning, NITK (EEE)
- Applications of Machine Learning Techniques to Medical Image Analysis
- Sensors and Actuators, SWAYAM (NPTEL)
- Digital Signal Processing, NITK (EEE)
- Python for Everybody, Coursera
- Python Data Structures, Coursera
- DrishTI Micro-controllers, Texas Instruments