

# 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 - Apr '21

Guide : [Prof. S K Nandy](#)

Network-router monitoring application in hardware for REDEFINE (a massively parallel and re-configurable silicon core technology). Prototype on RISC-V-based [PULPissimo](#). Involved Verilog, Vivado, Modelsim, Verilator.

Free and Open Source Silicon (FOSSi) Foundation

Student Developer (Under [Google Summer of Code \(GSoc\) 2020](#))

📅 May '20 - Sep '20

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, [Wadhvani 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

🎓 8.63 CGPA

Class 12<sup>th</sup> (CBSE)

Kendriya Vidyalaya, VSN, Nagpur

📅 May 2017

🎓 97.6%

Class 10<sup>th</sup> (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

SoC Design

RTL Design

Open-Source Toolchains

Hardware for ML Acceleration and HPC

## SKILLS & TOOLS

(System)Verilog / VHDL

Python

Bash Shell

Linux OS

C/C++

Xilinx Artix, Zynq MPSoC Platforms

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
- Potdar S.M.**, Gupta V., Umesh P., Gangadharan K.V. Conceptualization and Design of Remotely-Accessible Hardware Interface (RAHI) Laboratory. In Evolution in Computational Intelligence. Advances in Intelligent Systems and Computing, Springer [https://doi.org/10.1007/978-981-15-5788-0\\_12](https://doi.org/10.1007/978-981-15-5788-0_12)

## 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

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## 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

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## 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

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## 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

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## ACTIVITIES

- Teaching Assistant (TA) for 5 iterations of the global [RISC-V Microprocessor for You in Thirty Hours \(MYTH\) Workshop](#)
- [Career Guidance on ECE / EEE](#) for KLE Technological University
- Insight on [opportunities in Electrical Engineering](#), IEEE NITK, Dec '20
- Talk on [Experimenting with Open ISAs and associated projects](#), OpenPOWER Community (India), October '20
- 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](#)

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## ACHIEVEMENTS

- 🌟 [Google Summer of Code \(GSoc\), 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<sup>th</sup>](#)  
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

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## RELEVANT COURSES

- [Computer Architecture Winter School \(CAWS\) 2020](#)
- [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](#)