

Piyush Songara

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EDUCATION

- Indian Institute of Science** Bangalore, India
• *Master of Technology - Electronic System Engineering; CGPA: 9.3* Aug 2021 - Present
- Indian Institute of Information Technology, Design and Manufacturing** Jabalpur, India
• *Bachelor of Technology - Electronics & Communication; CGPA: 8.6* Aug 2017 - June 2021

PROJECTS

- Remote Lab Control & Monitoring Platform (M.tech Major Project):** Under the guidance of Prof. Kuruvilla Varghese, this project aims at providing remote lab access to perform laboratory experiments. FPGA Zybo Z7-20 is being used to implement the design. Technology: C, Verilog, HTML, JS, Petalinux, Xilinx(Vivado) (June'21 -present)
- Advanced Physical Design using Opensource OPENLANE & Google-Skywater 130nm PDKs:** Complete RTL to GDS-2 flow was performed on an opensource picorv32a RISC-V Cpu core and impact of changing synthesis strategies was observed. For some STA violations manual replacement of standard cells was done to meet the timing and an open-source standard cell was also plugged in the flow and then whole flow was analyzed. Tech: Openlane, Yosys, Magic, NGspice, TritonRoute (August '22)
- 16 bit Five stage Pipeline, Multi Cycle and Single Cycle RISC CPU Design:** Designed a Single Cycle RISC CPU with fixed instruction length supporting various logical, branch and arithmetic instructions. Further extended single cycle path to design a 5-stage Multi-Cycle path that supports the same instructions at a higher frequency. Tech: Verilog, VHDL, Xilinx(Vivado) (Aug'22)
- Design an ASIC for Handwritten Digits Recognition :** In this project handwritten digits were recognized using a trained Neural network inference engine on MATLAB. Verilog RTL code was written for the inference engine and ASIC flow was performed in Cadence tool. Technology: Verilog, Cadence tools, Modelsim (Dec '21)
- Powermeter(AC Power using Tiva Microcontroller Board TM4C123GH6PM):** Two 12-bit conversion precision ADCs(for current and voltage) on Tiva Board were used which will convert analog signal to digital signal for processing and then outputting the obtained Power, Power factor, RMS value of voltage(Vrms) and RMS value of current(Irms) to the LED display panel. Tech: C, Arm Cortex M4 (May '22)
- Design and Simulation of mmWave and Terahertz Patch Antenna for 5G and 6G Applications.:** Designed mmWave antenna which resonates at a frequency of 28Ghz with a bandwidth of around 2Ghz and a Terahertz antenna which resonates at 3.75Thz with a bandwidth of around 630Ghz. These antennae had excellent radiation efficiencies of greater than 90% each along with respectable directivities which make both of these antennas good candidates to incorporate 5G and 6G technologies in the future (May '21)

SKILLS SUMMARY

- Hardware Description Languages:** Verilog, VHDL
- Programming Languages:** C, HTML
- CAD Tools:** Xilinx Vivado, Matlab, Cadence Virtuoso, Genus, Innovus, CST Microwave Design Studio
- Microcontroller/FPGA Board:** ARM cortex M4(TM4C123GH6PM), ZYBO Z7-20
- Opensource Tools:** Ltspice, Openlane, Magic, OpenSTA, TritonRoute, Ngspice

ACADEMIC & ONLINE COURSES

- Digital VLSI Design:** Dr.Chetan Singh Thakur
- Digital System Design with FPGA:** Prof.Kuruvilla Varghese
- Fundamentals of MOS Analog IC's:** Dr.Sanjiv Sambandan
- Semiconductor Device Physics:** Dr.Sushobhan Avasthi
- Process Technology & System Eng.:** Dr.Hardik Pandya
- Processor System Design:** Prof.Kuruvilla Varghese
- Embedded System Design:** Prof.Haresh Dagale
- CMOS VLSI Design:** NPTEL
- Analog Circuits:** NPTEL
- Principles of Communication:** NPTEL

HONORS AND AWARDS

- Topped the certification course on "**Principles of Communication**" by NPTEL,IIT Madras by scoring 97%.
- Scored 86% marks in **RS-CIT**(Rajasthan State Certificate in Information Technology) conducted by VMOU,KOTA.

POSITION OF RESPONSIBILITY

- Teaching assistant for course "Mathematics for Electrical Engineers", IISC Bangalore - (Aug 1 - Present)
- Assistant Coordinator in Institute's Counselling Cell, IIIT Jabalpur - (May 19 - May 21)
- Student Guide in Institute's Counselling Cell, IIIT Jabalpur - (July 18 - May 19)

HOBBIES

- Chess
- Swimming
- Cricket
- Badminton
- Trekking