

Surya Pratap Sarangi

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Career Objective

Embedded Systems & VLSI Engineer with hands-on experience in RTL design, hardware-software integration, and edge computing. Skilled in Verilog, Raspberry Pi, and low-power design techniques. Proven ability to execute real-time object detection and design optimized MAC units for image processing. Seeking roles in ASIC/FPGA prototyping and embedded product development.

Education

Centurion University of Technology and Management

BTech in Electronics & Communication Engineering (VLSI Specialization)

Sep 2022 – Jun 2026

Prana Nath Autonomous College, Khurda

Higher Secondary Education (Science Stream)

Jul 2020 – Jun 2022

Saraswati Shishu Vidya Mandir, Jatani

School Education (10th)

May 2008 – Mar 2020

Experience

Machine Learning Intern Unified Mentor | Remote | May 2025 – Nov 2025

- Executing six ML projects focused on model training, data preprocessing, and algorithm design
- Applying Python and ML libraries to solve real-world problems
- Self-sponsored internship demonstrating initiative and commitment

Part-Time Tutor Self-employed | Jatani, Odisha | Sep 2023 – Present

- Tutored high school students in Physics and Mathematics
- Delivered personalized lessons and remote sessions to boost academic performance

Projects

Approximate MAC Unit for Edge Detection

Languages: Verilog, Python | Tools: Cadence, XILINX ISE, Jupyter Notebook

- Designed a Vedic multiplier and accumulator architecture to optimize edge detection in image processing pipelines
- Implemented approximate computing techniques to reduce hardware complexity while maintaining high-speed performance
- Achieved faster computation with reduced power and area overhead, suitable for low-resource embedded applications
- Validated FPGA-based digital designs using Xilinx ISE, with simulation and timing analysis for real-time image processing applications

Raspberry Pi-Based Real-Time Object Detection Using Pi-Cam

Language: Python | Tools: Raspberry Pi, Pi-Cam

- Trained a MobileNet model on the COCO dataset, achieving 89% detection accuracy over 100 epochs
- Deployed the model on Raspberry Pi with Pi-Cam integration for real-time object tracking and analysis
- Optimized inference pipeline for edge deployment, balancing accuracy and latency for embedded vision tasks

Analog Signal Acquisition System Using Arduino

Language: Embedded C | Tools: Arduino Uno, LM35, LM358 Op-Amp

- Designed and implemented a system to acquire and process analog signals using temperature and light sensors
- Applied signal conditioning techniques with op-amps and passive filters to prepare signals for ADC conversion
- Interfaced analog sensors with Arduino ADC and processed data using embedded C for real-time monitoring
- Demonstrated understanding of analog-digital integration and basic mixed-signal design principles

Certifications & Ongoing Learning

- Completed NPTEL course on VLSI Design Flow: RTL to GDS
- Studying mixed-signal design and power conversion topologies



Skills

Programming Languages C, C++, Embedded C, Python, Verilog, SystemVerilog

FPGA & EDA Tools: Vivado, Xilinx ISE, Cadence

Embedded Platforms: Arduino IDE, Raspbian OS

Design & Development Tools RTL Design, FPGA Prototyping, ASIC Flow, Synthesis, Timing Analysis, Simulation & Debugging

Operating Systems Linux (Raspbian, Ubuntu), Real-Time Operating Systems (RTOS)

Libraries & Frameworks OpenCV, NumPy, scikit-learn

Core Competencies Hardware-Software Integration, Low-Power Design Techniques, Linux Shell Commands, Sensor Interfacing, Serial Communication (UART, SPI, I2C)