Aran Seth

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EDUCATION

Birla Institute of Technology & Science, Pilani, India Graduating May '25
Bachelor of Engineering (Honours) Electrical and Electronics Engineering *CGPA: 8.31*
Coursework: Analog & Digital VLSI Design, Computer Architecture, Electronic Devices, Communication Systems, Embedded System Design, Digital Design, Microelectronic Circuits, Analog Electronics, Microprocessors Programming & Interfacing, Electrical Sciences, Computer Programming

RESEARCH PROJECTS

Simulation and Modelling of STT-MTJ based MRAM Aug '23 – Present
Advisor: Prof. Abhijit J. Pethe, Head of Department, BITS Pilani, India
- Developed a Spin Transfer Torque Magnetic-Tunnel Junction-based model for a MRAM in **Verilog-A, Python**
- Verified model by simulating write & PCSA based read circuits in **Cadence Virtuoso**
- Simulated MRAM **Crossbar Arrays** to implement **In-Memory Computing** in Python

Software Defined Acoustic Modem for Underwater Communication May '23 – Apr '24
Advisor: Dr. Sarang C. Dhongdi, Assistant Professor, BITS Pilani, India
- Implemented underwater communication using **BFSK** modulation on the acoustic signal through software-defined modem running on Raspberry Pi's using **Unet Audio**
- Data transfer speeds of up to **200 Bits/sec** were achieved using BFSK modulation
- A demonstration of our communication system was given at the **CSIR National Institute of Oceanography, Goa** at the **Marine Robotics Schools Conference** in November 2023.

Five-Stage Pipelined MIPS based Processor Mar '24 – Apr '24
Advisor: Prof. Amalin Prince A, Professor, BITS Pilani, India
- Implemented a five-stage MIPS based processor in **Xilinx Vivado** with forwarding, stalling and flushing to resolve data and control hazards
- This processor supports the following six instructions: load upper immediate, or immediate, set on less than, load word, store word, jump

RFID Based Library Access Module Oct '23 – Dec '23
Advisor: Prof. Anupama KR, Senior Professor, BITS Pilani, India
- Implemented a RFID based Library Acess Module by interfacing RFID sensors, speakers, LCD panel to a **STM32F4XX** Microcontroller
- Used RFID sensor to verify access cards, confirming user details and displaying user information on the LCD screen
- Programmed the STM32 board using Kiel in Embedded C

WORK EXPERIENCE

Birla Institute of Technology & Science, Pilani, India | *Teaching Assistant* Jan '24 – May'24
- Teaching Assistant for the course **Microelectronics Circuits**
- Conducted weekly labs, designed questions and helped students understand the implementation of MOSFET-based amplifier circuits on **Cadence Virtuoso**

Indian Institute of Technology, Roorkee | *Research Intern* Jun '23 – Aug '23
- Studied the working of **MRAM** devices and **crossbar arrays** and understood their application in in-memory computing
- Developed a **SPICE** model for a MRAM device, improves computation by solving **LLG** equation in spherical coordinates
- Verified model behaviour by simulating read and write circuits
- Worked under the guidance of Dr. Tanmoy Pramanik, Assistant Professor, IIT, Roorkee

SKILLS, AWARDS & CERTIFICATIONS

Technical Skills: Cadence Virtuoso, Verilog, Verilog A, Vivado, SPICE, MATLAB, Python, C, Assembly Language, Keil
Awards: Awarded a research grant of **$ 3000**, Presented my work at the **Marine Robotics School Conference 2023**
Certifications: MATLAB Onramp, Stanford Machine Learning Specialisation
Activities: Core Member - Alumni Relations Cell, Core Member - Developers Society, Member - Kala
Languages: English, Hindi