VEERASAKTHI G

Circuit Designer, Analog Engineer
4th Year in Amrita University

Education

Bachelor of Technology in Electronics and Communication Engineering

Current CGPA: 6.2/10

Semester 7 – November 2024

Areas of interest

Analog Electronics

Power Electronics

Linear Integrated Ciruits

Contact

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PROJECTS

Large Scale Projects

- **ISRO IRoC-U 2024**:
  Developed an autonomous rover with a robotic arm designed for sample retrieval missions, capable of climbing and navigating through obstacles. The rover utilizes an RGBD camera and a 360° camera for obstacle avoidance and object detection.

  Skill: Power Circuit Design,, Microcontroller, Component Selection and Sizing, Simulation and Modeling, Thermal Management, PCB Layout for Power Components, Compliance and Testing

- **Modified Viterbi Decoder Architecture (ongoing)** :
  This project aims to design a modified Viterbi decoder by integrating the conventional hard decision decoder design with a reconfigurable process element for high speed and low power. Further enhancement for power efficiency would be attempted by using optimization algorithms for the Hamming distance module in the proposed architecture.

  Skills: VLSI Verilog, Information theory and coding technique

Mini Projects

Electronic Harmonium:
The electronic harmonium project recreates the sound of a traditional harmonium by using a 555 timer IC to generate specific audio frequencies for each musical note. When a key on the keyboard is pressed, it triggers the timer to produce the desired frequency, which is then amplified to create an audible sound through a speaker. This setup removes the need for manual air pumping, making the instrument portable, stable, and easy to use while maintaining the harmonium's characteristic tones.

Skills: Analog Electronics, Circuit Design

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Software

Ansys HFSS

Proteus

LT Spice

Spyder IDLE

Certificates

Bio medical signal processing (Workshop)

Electric Cars (Workshop)

Internet of things

PROJECTS

Academic projects

Detecting Chords using Python:
This project presents a Python-based system for real-time chord detection using librosa for audio processing. An algorithm utilizing DFT and machine learning accurately identifies chord patterns across genres, supporting applications in music analysis and transcription. The system showcases the potential of automated chord detection as a powerful tool for musicians and researchers

Skills: Digital Signal Processing (DSP), Machine Learning Fundamentals

Security System with 4-Bit BCD Adder Access Control:
Designed a digital security system with a 3-bit binary login code and a 2-bit password input. Implemented access control allowing only four authorized users, who upon correct authentication, could access a 4-bit BCD adder. If unauthorized, the adder output defaults to zero. Displayed outputs using a seven-segment display with an LED for carry indication

Skills: Digital Logic Design, Circuit Design, Binary and BCD Arithmetic, Component Integration, Circuit Testing.

4 BIT Arithmetic Logic unit:
Designed and implemented a 4-bit ALU using VHDL, which performs arithmetic, logic, and shift operations based on a 4-bit opcode. The ALU includes modules for addition, subtraction, multiplication, division, and bitwise logic functions (AND, OR, NAND, NOR, XNOR), as well as left and right shifts and rotations. The design was deployed on a Basys FPGA board, verified through simulation and real-world testing to ensure functionality.

Skills: VHDL, FPGA Programming, Digital Circuit Design, Logic Design, Arithmetic Operations, Signal Mapping, Simulation, Basys Board Debugging.