Sarthak Samal

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PROFESSIONAL SUMMARY

Highly motivated and versatile Biomedical Engineer with a strong foundation in electrical engineering principles, seeking to apply interdisciplinary expertise to innovative projects in the electrical engineering field. Skilled in circuit design, signal processing, and embedded systems, with hands-on experience bridging medical technology and electronic systems. Experienced in problem solving, data analysis and cross-functional collaboration.

EDUCATION

University of Colorado, Boulder Graduation Date: December 2024
B.S. in Biomedical Engineering Major GPA: 3.2
Minor in Electrical Engineering

SKILLS

- Altium Designer, Unix, Git, Shell scripts, MATLAB, Assembly, C/C++, TCP/IP, HTML, CSS, Python, JavaScript
- PCB Design and Layout, Design Rule Checking, Embedded Systems, Digital/Analog Electronics, Prototyping Electronics, Signal Processing, CAD (SolidWorks certified)
- Microsoft Office Suite (including Excel VBA)
- English (Fluent), Odia (Fluent), Japanese (Intermediate)

WORK EXPERIENCE

Heart-to-Brain Blood Flow Research Assistant | FLOWLab, *Boulder, Colorado* April 2023 – December 2024

- Designed patient-specific heart to brain models to determine the impact of distal aortic embolisms on strokes.
- Conducted CFD simulations through meshed blood vessels in SimVascular to determine velocity profiles and embolism destination.

Electronics Design Lab Assistant | University of Colorado at Boulder September 2024 – December 2024

- Presented the fundamentals of analog circuit design and principles to students building a motorized robot.

Systems Engineer and Logistics Manager | Steadman Philippon, *Boulder, Colorado* September 2023 – May 2024

- Collaborated on a senior capstone project to develop MATLAB image denoising machine learning algorithms.
- Enhanced the precision and effectiveness of bone joint X-ray image analysis pipelines, streamlining the process of generating 3D bone models by reducing computation time by 30%.
- Implemented a convolutional neural network-based approach to train an algorithm for X-ray image denoising and achieved an accuracy of 85% with our final model.
- Managed team operations, which included task scheduling, orchestrating regular check-in meetings, and facilitating seamless communication and collaboration among team members.

Medical Device Engineer | University of Colorado Boulder September – November 2020

- Modeled and constructed eyewear to provide real-time alerts to visually impaired users of nearby obstructions via ultrasonic detection.
- Designed and tested multiple iterations to find the optimal ultrasonic arrangement.
- Piped Arduino ultrasonic sensor data into MATLAB for more powerful signal processing, to develop more robust embedded algorithms.
- Conducted comprehensive market research to better understand the unique requirements of individuals with visual impairments, enabling the creation of an innovative product tailored to their specific needs.

PROJECTS

Golden Arduino Design | University of Colorado Boulder November 2024

- Designed a custom Arduino on a 4-layer PCB to improve signal integrity.
- Demonstrated high-speed digital design and understanding of embedded systems.
- Improved performance by 10% compared to commercial Arduino.
- Optimized and improved Arduino layout to shrink board size by 60% to use as a layout for future projects.

Instrument Droid | University of Colorado Boulder December 2024

- Designed an instrument to measure thevenin voltage and resistance of any VRM.
- Features an on-board Arduino for standalone functionality.
- Calculates voltages and resistances with high accuracy (within 10%).

6502-based Breadboard Computer | Aurora, Colorado April 2025

- Designed and constructed a computer from scratch using a W65C02 microprocessor to understand CPU and computer architecture.
- Utilized machine code and Assembly to gain understanding of memory handling and management.
- Designed a logic board with exchangeable ROM and RAM using high-speed digital design principles for personal use.

LEADERSHIP AND INVOLVEMENT

CU Boulder Milana | University of Colorado Boulder October 2022 - May 2024

- Engaged in cultural dance ensembles committed to promoting the rich traditions of both classical and contemporary Indian dance forms within the university and across the state of Colorado.
- Showcased performances at diverse venues, including cultural festivals, exhibitions, and sporting events.

Colorado Crew Rowing Team | University of Colorado Boulder October 2022 – Spring 2023

- Joined the Varsity team within the first year and the team's board as a fundraiser
- Exemplified exceptional time management skills by consistently attending early morning practice sessions
- Collaborated with organizations and university facilities to raise $1500+ in funds for the team.