# 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.

## CERTIFICATIONS

**C++ For C Programmers** | University of California, Santa Cruz (Coursera) June 2025

- Displayed proficiency in object-oriented programming.
- Practiced using the standard template library.
- Implemented highly efficient and robust graph traversal algorithms.

## LEADERSHIP AND INVOLVEMENT

**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.