

Chironjeet Das Joy

<https://chironjeetjoy.github.io/>

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Research Focus

Robot Control, Joints, Sensory Infusion, Embedded System and Dexterous Manipulation.

Education **BRAC University, Dhaka, Bangladesh** (2020- 2024)
Bachelor of Science in Electrical and Electronic Engineering
Specialization: Electronics (With focus on Robotics and Intelligent System)
CGPA: 3.6/4.0

Research Experience **Laboratory of Space System Engineering & Technology - LASSET with Abdulla Hil Kafi & Raihana Shams Islam Antara.** (2023 – Current)

Satellite Ground Sensory Terminal Project.

Developed and implemented a time series data collection system for the *Satellite Ground Sensory Terminal Project*, utilizing multiple sensory inputs to monitor crop fields in rural areas via the KITSUNE Satellite.

Designed a compact and easily deployable system, contributing significantly to project ideation and execution.

RAVEN - Research on Aerial Vehicle with Enhanced Neural network.

Inspired by real-world problems with drone stabilization in complex aerodynamics during rescue scenarios, an Inertial Measurement Unit on the flight controller provides data about the drone cartesian position. Despite using regular PID controller, a Neural Network approach might lead to better stabilization. (*Ongoing*)

Currently building a controlled room with infrared tracking camera completely built from scratch to simulate complex aerodynamics and to take 3D position of the drone for comparing to the IMU data.

Control & Application Research Center - with Dr. A.K.M. Abdul Malek Azad. (2022 - 2023)
Solar Powered DC Compressor & High Voltage Switching.

Developed an experimental fridge with a DC compressor and Solar panel with graduate students. Later designed a high-voltage switching system using solid-state relays for multipurpose applications in collaboration with graduate students

FYDP/Capstone Project - with Dr. Abu S.M. Mohsin

7 DoF Robotic Arm Solution for Automated Medicine Inventory Control

Project Lead: Led the development of a low-cost robotic arm with seven degrees of freedom for an automated medicine shelving, stacking, and retrieval system. Designed the system using stereovision cameras for enhanced spatial awareness and 12-bit absolute magnetic encoders for precise motion control, aimed at reducing drug misplacement errors and improving accuracy in pharmaceutical environments.

On-Going Work **Design Flight Control Systems by Optimizing PID Control Algorithms for Enhanced Thrust Vectoring in Hybrid Rocket Engines.** – Current.

-Working as a Research assistant to build the test bench, TVC mechanism and control algorithm.

Grad Course and Other Projects **High Performance Flight Controller for Hybrid Rocket Engine - with Abdulla Hil Kafi** (2025 – Current)

Designed and developed a custom flight controller for a hybrid rocket engine using Teensy 4.1, programming in C/C++ to integrate accelerometers, gyroscopes, and pressure sensors, and implementing custom algorithms for real-time flight control, achieving reliable performance during simulated tests.

SwarmSync Controller Board for Modular Robotic Assembly (2025)

Designed a Wi-Fi-enabled circuit with servo control and power-sharing connectors to facilitate autonomous robotic swarm assembly for dynamic structural formations.

SafeFall: A Multimodal Human Fall Dataset Captured via IMU, RGB, and Depth Camera

Sensors - with Md. Mehedi Hasan Shawon

(2025)

Developed data processing for SafeFall, a multimodal dataset from 30 participants, enhancing fall detection with synchronized RGB, depth, and IMU data, advancing ambient intelligence and activity recognition.

EEE383 Electronic System Design with Abdulla Hil Kafi

(2023)

Partnered with five undergraduate students and worked on a NANO Satellite designing project to collect data from multiple ground station to send back the data to a centralized ground control system. Designed and implemented the payload and communication

EEE383 EMBEDDED SYSTEM DESIGN with Nahid Hossain Taz

(2023)

Developed a secure lock system using ATmega32 microcontroller, integrated with remote control functionality for enhanced accessibility. The system included real-time control, secure authentication protocols, and low-power operation, ensuring reliability and efficiency in both residential and commercial applications.

Flying Raijin

Developed a STM32 based FPV drone equipped with custom stereo-vision camera built from scratch. The drone achieved ~150 km/h in 0 to 2 second (as verified by the on-board GPS module)

Epileptic Seizure Detection and Classification Using Machine Learning Algorithms

(2023)

Developed and implemented a machine learning framework to classify three stages of epileptic seizures (normal, pre-seizure, and seizure) using EEG signals from the Physionet dataset, with a focus on leveraging transfer learning in YOLOv8 for superior accuracy.

Publications

T. Mahmud*, T. U. Wara, and **C. D. Joy**, *Risk Factor Identification and Classification of Malnutrition Among Under-Five Children in Bangladesh: Machine Learning and Statistical Approach*. (Under Review at Heliyon).

A. H. Kafi, **C. D. Joy**, P. M. Golpa, and R. S. I. Antara, "Optimizing soybean production with ground sensor terminal-based monitoring system," in 74th International Astronautical Congress (IAC), Baku, Azerbaijan, Oct. 2-6, 2023

Awards

LASSET Research Grant (RAVEN) – 2024, 2023

BRACU Student Assistant Fund – 2021, 2020

Dean's List (Spring 2021, Spring 2022, Spring 2023, Fall 2023) – Awarded for academic excellence across multiple terms.

Community Involvement

LASSET, Outreach Team Lead –

(2023 – Current)

BARCU EEE Club, Mentor –

(2021 – 2023)

BARCU Computer Club, Mentor –

(2021 – 2022)

University Student Parliament, General Secretary –

(2020 – Current)