Dr. AKHILESH DAS GUPTA INSTITUTE OF PROFESSIONAL STUDIES
FC-26, SHASTRI PARK, NEW DELHI.

Department of Artificial Intelligence and Machine Learning

Dated: 21/02/2025

REPORT

AIML Project Exhibition

Date of Event: 21st February 2025

Venue: In Front of the 2nd Block

PROJECT 1

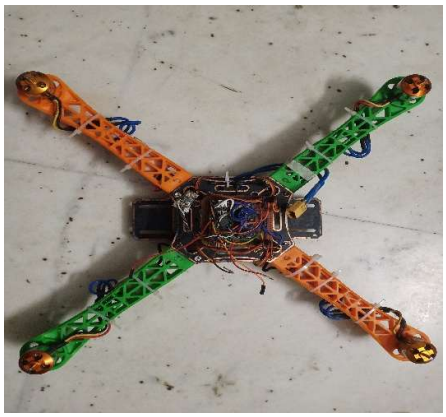
Title: Open Source Flight Controller – DRONE ACHARYA

Objectives: To develop an open-source, modular, and affordable flight controller system for autonomous and manual drone applications, supporting both modern and legacy communication protocols.

Students: Pradipta Shanu & Team Kritrim Dhi

Key Takeaways:
- Familiarity with STM32 microcontrollers.
- Understanding of drone navigation protocols like INAV and Betaflight.
- Use of multiple sensors including GPS, IMU, and barometer.

Description:
The DRONE ACHARYA flight controller is built on the STM32F411CEU6 microcontroller with integrated sensors such as MPU-6500 (IMU), QMC-5883 (Compass), BMP-180 (Barometer), and NEO-6M GPS. It supports modern protocols like ELRS, CRSF and older ones like PPM, SBUS, and IBUS. Flight modes include Altitude Hold, Angle, Acro, Horizontal Mode, GPS Navigation, and Return to Home. The system is fully configurable without coding and allows upgrades like sonar, Bluetooth setup, OSD, and black-box logging.



PROJECT 2

Title: Open Source Flight Controller – DRONE ACHARYA V2

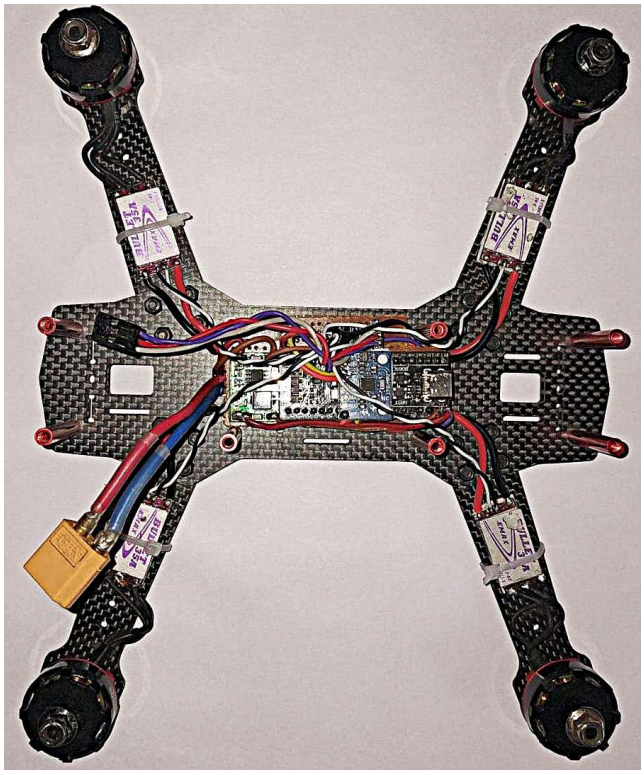
Objectives: To enhance the DRONE ACHARYA for FPV racing and aerial filming using high-performance ESCs and motors with Betaflight tuning support.

Students: Pradipta Shanu & Team Kritrim Dhi

Key Takeaways:

- Hands-on with 35A Multishot ESCs and 2205 2300KV motors.
- Integration with Betaflight software.
- Wireless configuration and FPV video transmission setups.

Description:
ACHARYA V2 is tailored for FPV and film-based drone applications. It retains the STM32F411CEU6 MCU and MPU-6500 IMU but adds 35A ESCs and high-speed BLDC motors. Configured with Betaflight for optimized flight, it supports seamless upgrades such as OSD for video feed and Bluetooth for configuration. This version maintains backward compatibility with legacy receivers while delivering racing-grade performance.



PROJECT 3

Title: Open Source Flight Controller – TRICOPTER

Objectives: To demonstrate a minimal-cost flight controller solution using Arduino and basic hardware, enabling entry-level drone control with PID tuning.

Students: Pradipta Shanu & Team Kritrim Dhi

Key Takeaways:
- Implementation of Multiwii firmware.
- PID control tuning using Arduino IDE.
- Cost-effective tricopter architecture.

Description:
This project is a budget tricopter powered by Arduino Nano (ATmega328p), MPU-6050, and 2212 motors with a 90GR servo. It relies on Multiwii firmware and requires basic coding skills for setup. With PWM receivers and simple ESCs, this platform showcases how even minimal resources can yield a stable flying model with correct PID tuning. All hardware is utilized at maximum efficiency with no further upgrades possible.

PROJECT 4

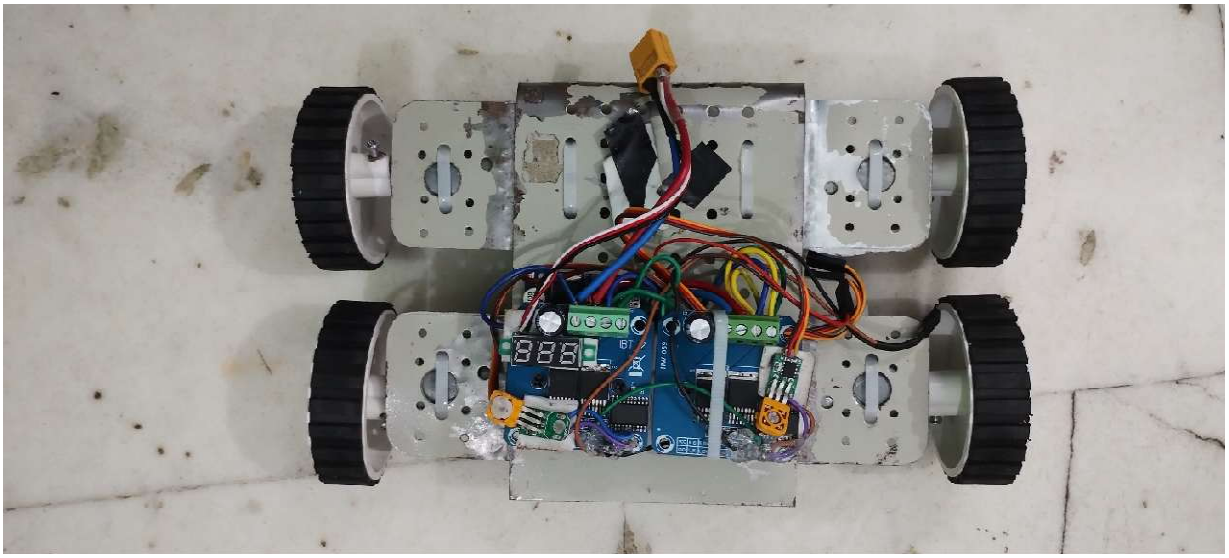
Title: SUMO LAL V-1

Objectives: To design a powerful and simple motion control system for competitive robotic applications like Robo Soccer and RC Sumo using minimal hardware.

Students: Pradipta Shanu & Team Kritrim Dhi

Key Takeaways:
- Practical insight into brushed motor ESCs and servo control.
- Application in high-current competition settings.
- Simplicity-focused hardware setup without a microcontroller.

Description:
SUMO LAL V1 is a robust controller solution tailored for RC Sumo, Robo Soccer, and track racing applications. Notably, it operates without a microcontroller, reducing complexity. Core components include BTS7960 brushed ESCs, high-torque servo motors, and standard or ELRS PWM receivers. This design has already proven successful in competitions like Robo Soccer at IIT Madras, emphasizing high-power handling and minimal configuration requirements.



HIGHLIGHTS


FOR SUSTAINABLE
CONSTRUCTION MATERIALS
कृत्रिम धी
ASTON MARTIN


कृत्रिम धी


FOR SUSTAINABLE
CONSTRUCTION MATERIALS
कृत्रिम-थी
ASTON MARTIN


CENTRE OF EXCELLENCE
FOR SUSTAINABLE
CONSTRUCTION MATERIALS
कृत्रिम-थी
PARTS REQUIRED
FEATURES
Team Mechaminds


कृत्रिम धी
Emirates
FLY BETTER


कृत्रिम धी

Dr. Neha Yadav
Event Organizer

Prof. (Dr.) Ankit Verma
Head of Department