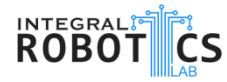# INTEGRAL ROBOTICS LAB
INTEGRAL UNIVERSITY LUCKNOW

BACHELOR'S THESIS

DESIGN & DEVELOPMENT OF SPHERICAL ROBOT

Project Description:

This project involves the development of a self-balancing spherical robot designed for remote navigation via Wi-Fi. The system integrates NodeMCU, ESP32-CAM, servo motors, DC motors, and a motor driver, all controlled by a custom PID controller implemented in MATLAB Simulink.

The robot maintains stability using real-time sensor feedback, with motion commands sent from a custom Android app. The ESP32-CAM provides live video streaming for enhanced remote monitoring. Key challenges, such as ensuring smooth motion and reliable wireless communication, were addressed by optimizing Wi-Fi data transmission for low-latency control.

This project demonstrates potential applications in remote surveillance, environmental exploration, and robotics education, showcasing the integration of IoT components with advanced control algorithms.

Tasks Involved:

1. Implementation of Simulink-based PID control for balancing
2. Integration of Android app for real-time navigation and WiFi communication
3. ESP32 CAM-based video streaming setup
4. Testing & performance evaluation of movement and control

Mentor:

Mr. Mohd. Zaid

Supervisor:

Dr. Mohd. Atif Siddiqui

Start Date: 16/AUG/2024

Expected End Date: 16/NOV/2024