



# TEEGALA KRISHNA REDDY ENGINEERING COLLEGE

## (UGC-Autonomous)

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### MINI PROJECT ABSTRACT SUBMISSION

<b>Project Title:</b> SMART HUMAN FOLLOWING PET ROBOT	Batch No : 2
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#### **Candidate Details**

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#### **Guide Details**

Name	Dr.E.Radhamma	Designation	Associate professor
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#### **Objectives:**

- To design a servo-based walking pet robot using ESP32.
- To enable human following and obstacle avoidance using sensors.
- To provide interactive behavior through sound alerts.
- To demonstrate autonomous and Bluetooth-controlled operation.

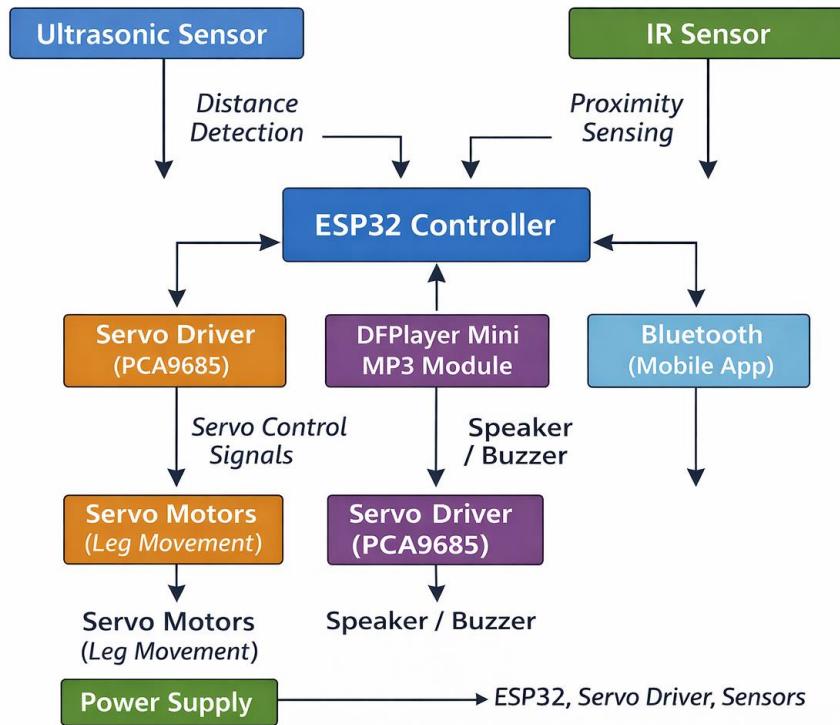
#### **Abstract:**

This project focuses on the design and implementation of an ESP32-based walking pet robot that demonstrates human-following and obstacle-avoidance behavior. The robot uses multiple servo motors as legs to achieve walking motion, while an additional servo-mounted ultrasonic sensor scans the surrounding environment to detect human presence and obstacles. Based on the distance information, the robot intelligently follows a person, stops automatically when the person stops, and activates a buzzer or sound module when it comes too close. Bluetooth communication enables manual control and mode selection through a mobile device. The proposed system provides a low-cost and efficient solution for studying autonomous navigation, interactive robotics, and embedded system integration.

## COMPONENTS USED:

- ESP32 Development Board
- Servo motors (4 for legs + 1 for ultrasonic scanning)
- PCA9685 Servo Motor Driver
- Ultrasonic Sensor (HC-SR04)
- IR Sensor
- DFPlayer Mini MP3 Module
- Micro SD Card (for audio files)
- Buzzer / Speaker
- Battery & Power Supply Module
- Chassis / Mechanical Frame
- Connecting Wires & Accessories

## BLOCK DIAGRAM :



## ADVANTAGES:

- Fully autonomous human-following operation
- Obstacle avoidance for safe navigation
- Realistic walking using servo motors
- Interactive behavior with sound alerts
- Bluetooth-enabled manual control
- Low-cost and energy-efficient design
- Suitable for educational and research purposes

## **APPLICATIONS:**

- Interactive robotic pets
- Educational robotics and learning kits
- Human–robot interaction research
- Assistive companion robots
- Smart home and indoor robotics
- Demonstration models for embedded systems and AI concepts

**Signature of the Guide**