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Automatic Pet Feeder Using IOT

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ABSTRACT: The automatic pet feeder is designed to automate the feeding process for pets while incorporating a water dispenser feature. The implementation utilizes ESP32 module boards and leverages the Blynk app for user control and monitoring.The core system comprises an ESP32 module board, acting as the central control unit, along with various peripheral components such as food storage containers, feeding mechanisms, and a water dispenser. The ESP32 module board serves as the brain of the system, managing and coordinating the overall functionality.To establish seamless communication and user control, the project integrates the Blynk app. The Blynk app provides an intuitive and user-friendly interface, enabling pet owners to remotely manage feeding schedules, portion sizes, and monitor the system's status from their smartphones.The feeding mechanism is designed to dispense the appropriate amount of food for both cats and dogs, ensuring precise control over portion sizes and preventing overfeeding or underfeeding. The ESP32 module board receives commands from the Blynk app and orchestrates the feeding process accordingly.In addition to the feeding functionality, the system includes a water dispenser component. The ESP32 module board controls the water dispenser, allowing users to remotely provide fresh water to their pets using the Blynk app. Users can schedule water dispensing intervals or trigger immediate dispensing as needed.

KEYWORDS:ESP32,Blynk app, Feeding schedules, Servo Motors.

I. INTRODUCTION

An automatic pet feeder is one of the new technologies for feeding pets. It will help pet owners to take care of their pets while they are not at home. Even if the owners are not at home, they still can feed their pets. An automatic pet feeder is built to help pet owners take care of their pets. IoT pet feeder is one of the pet feeders that will be controlled by a mobile application through the internet. The automatic pet feeder will automatically dispense a predetermined amount of food and water to the bowls. As pet lovers, users should understand those pets also need proper diet management. Whether the user is away from home unexpectedly or simply would like one less chore to worry about, the user can feel secure that the beloved pet will be cared for and fed on time every time.

The Automatic pet feeder will solve two problems that pet owners face i.e., making sure that each pet has access to a healthy amount of food throughout the day, regardless of the owner's schedule. Make sure that each pet eats only its food though there are a variety of products on the market which solve the first problem, there are none which address the second. The automatic pet feeder will give pet owners a solution to both problems, thereby improving the lives of both pets and owners by allowing the owner to reliably provide food to a pet at the time the owner wishes and keep the pet from reaching the food stored for later feedings.Many animal feed systems can be designed to function as automatic devices that allow the user to feed whenever he wishes from anywhere through the internet. The purpose of having sensors in a system like this is to automate the feed process completely with less human interference.The proposed system of the Automatic Pet Feeder using IoT incorporates various features and technologies to provide an advanced and convenient feeding solution for pets.

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II. METHODOLOGY

The camera in the dispenser starts detecting the pet once the pet is detected and it is recognized as a required pet, it checks for the scheduled time if the time is scheduled time, the specifiedservo motor dispensed the right kind of food. For dog food the amount dispensed is based on the rotation and duration of the servo motor. Once the predefined duration is completed the servo motor rotates back and close the dispenser food is filled into the bowl. If the detected pet is cat then it dispenses the corresponding food by triggering the servo motor for the specified duration. If the time is not equal to scheduled time it does not triggers the dispensers. The user can also trigger the dispenser manually by using the Blynk API, user can also watch the live streaming of the dispenser camera through the local server created by ESP32 module using the IP.

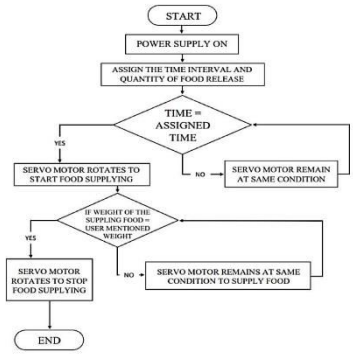

Figure 1Flow Chart

Objective

- To develop an automated system that detects different pets from different species.
- To make sure that it dispenses the right kind of food for the right kind of pet.
- To dispense food at the user-specified time.
- To completely avoid the presence and interference of the owner.

III. MODELING AND ANALYSIS

ESP32-CAM : It is an Ai-Thinker's Original ESP32 CAM WiFi+Bluetooth with OV2640 Camera Module based on the ESP32 chip with the additional facility of using a camera.The ESP32-CAM is a full-featured microcontroller that also has an integrated video camera and microSD card socket and camera with advanced functions like image tracking and recognition, here it is used for Pet detection.

ESP32: It is design for low power IoT applications in mind. It's high processing power with in-built Wi-Fi / Bluetooth and Deep Sleep Operating capabilities makes it ideal for most Portable IoT devices, it receives the signal from the ESP32-CAM module which detects the pet based on the detected pet, the ESP32 controls the operations of the servo motors.

IR Sensor : An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion, in pet feeder it is used check whether there is food in bowl or not. If the food is present in the bowl the food is not dispensed again.

Servo Motors : The servo motors can rotate only from 0° to 180° due to their gear arrangement so make sure you that it can live with the half circle, it is used for opening and closing of the food container in the dispenser model. It rotates

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for the specified duration based on this duration the food is dispensed from the container. This servo motor acts as the open and close gate of the container.

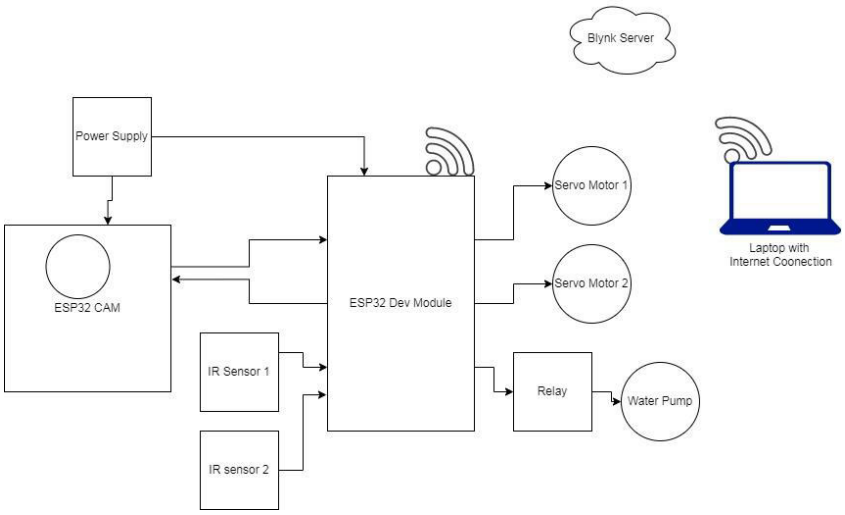

Figure 2Block Diagram

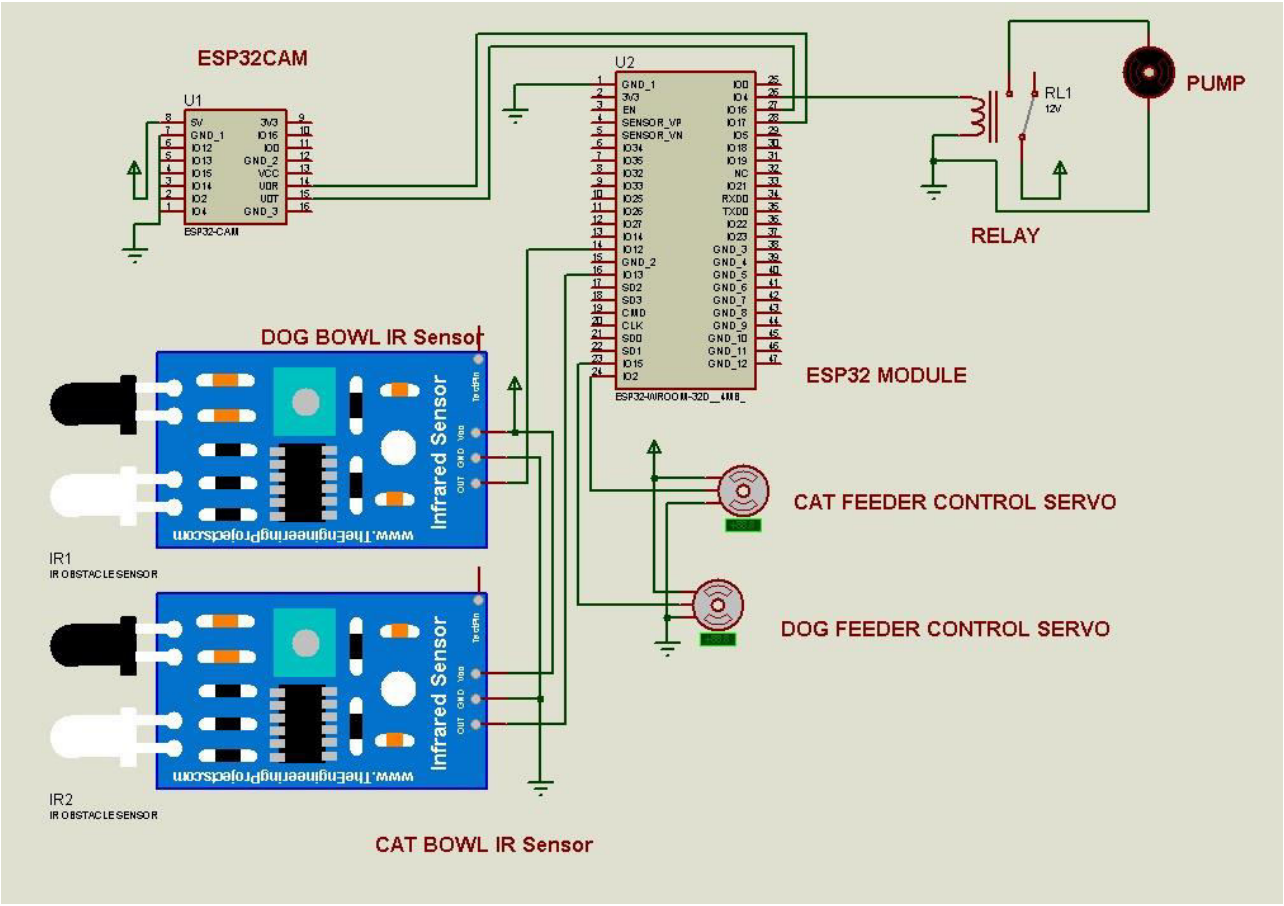

Figure 3 Circuit Diagram

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IV. RESULTS AND DISCUSSION

In this project,Auto pet feeder is the solution for those who love to keep pet in house but because of busy schedule they may not be able to provide food to their beloved pets at fixed time. This prototype can be used to release food. The stored food will automatically come through the pipe at that assigned time and will be collected in the bowl.Automatic pet feeders using IoT can provide convenience for pet owners by automating the feeding process. Pet owners can remotely control and monitor the feeding schedule, ensuring that their pets are fed on time even when they are away from home. This can save time and provide peace of mind for pet owners. This can contribute to maintaining a balanced and healthy diet for pets, reducing the risk of obesity or malnutrition. It ensures consistent feeding schedule and it provides remote monitoring. Pet owners can adjust feeding schedules, portion sizes, and food types to cater to their petsdietary requirements and preferences.By collecting data on feeding patterns and consumption, automatic pet feeders using IoT canprovide valuable insights into a pet's eating habits and overall health. Analyzing this data can help identify any changes in appetite or behavior that may indicate underlying health issues.

V. CONCLUSION AND FUTURE WORK

From this method we can conclude that the proposed approach uses the Tensor flow frame work to detect the pet and triggers the dispenser to dispense the corresponding food this helps to keep the pet diet on time and healthy.The field of automatic pet feeders using IoT is continuously evolving, and there are several potential areas of future work that can further enhance the functionality, features, and user experience. Here are possibilities for future work,explore more advanced scheduling options for feeding, such as personalized feeding plans based on pet age, breed, weight, and activity level. Incorporate machine learning algorithms to create optimized feeding schedules that adapt to the specific needs of individual pets.Integrate nutritional analysis capabilities into the automatic pet feeder system. Utilize data on pet food ingredients, calorie counts, and nutritional content to provide personalized feeding recommendations based on a pet's specific dietary requirements.AlsoHealth Monitoring and Alerts,Integration with Veterinary Care, Behavioral Analysis and Enrichment, Smart Food Replenishment and Ordering

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