

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Jnana Sangama, Belagavi – 590014



An Internship Project Report
On

“SMART PET FEEDER”

Submitted in partial fulfillment of the requirement for the award of degree of

BACHELOR OF ENGINEERING

In

COMPUTER SCIENCE & ENGINEERING

By

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Under the guidance of
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2023 - 2024

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

A P S COLLEGE OF ENGINEERING

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Project Completion Certificate/Industrial Certificate

I, **Syed Manam Qadri 1AP21EC017**, hereby declare that the material presented in the Project Report titled "**SMART PET FEEDER**" represents original work carried out by me in the Department of **Electronics and Communication Engineering** at the **APS college of Engineering, Bangalore** during the tenure 2 October, 2024 – 12, December, 2024.

With My signature, I certify that:

- I have not manipulated any of the data or results.
- I have not committed any plagiarism of intellectual property and have clearly indicated and referenced the contributions of others.
- I have explicitly acknowledged all collaborative research and discussions.
- I understand that any false claim will result in severe disciplinary action.
- I understand that the work may be screened for any form of academic misconduct.

Date:13/12/2024

Student Signature:

In my capacity as the supervisor of the above-mentioned work, I certify that the work presented in this report was carried out under my supervision and is worthy of consideration for the requirements of the B.Tech. Internship Work.

Advisor's Name:

Prof. Shivamurthaiah M

Guide Name:

Mr. Akhil Sai

Project Completion Certificate/Industrial Certificate

I, **Rahul Sharma 1AP21CS037**, hereby declare that the material presented in the Project Report titled "**SMART PET FEEDER**" represents original work carried out by me in the Department of **Computer Science and Engineering** at the **APS college of Engineering, Bangalore** during the tenure 2 October, 2024 – 12, December, 2024.

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Advisor's Name:

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Guide Name:

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Project Completion Certificate/Industrial Certificate

I, **Sayan Chatterjee 1AP21CS039**, hereby declare that the material presented in the Project Report titled " **SMART PET FEEDER** " represents original work carried out by me in the Department of **Computer Science and Engineering** at the **APS college of Engineering, Bangalore** during the tenure 2 October, 2024 – 12, December, 2024.

With My signature, I certify that:

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Advisor's Name:

Prof. Shivamurthaiah M

Guide Name:

Mr. Akhil Sai

Evaluation Sheet

Title of the Project: SMART PET FEEDER

Name of the Students: Syed Manam Qadri 1AP21EC017

Rahul Sharma 1AP21CS037

Sayan Chatterjee 1AP21CS039

External Supervisor:

Mr. Sai Charan Teja

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Date:

13/12/2024

Place:

APS college of Engineering, Bangalore

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ABSTRACT

The Smart Pet Feeder is an innovative system that integrates Internet of Things (IoT) and Artificial Intelligence (AI) to automate and optimize pet care. Designed to simplify feeding routines, this feeder allows pet owners to manage feeding schedules remotely, monitor food levels in real time, and ensure accurate portion control based on their pet's behavior and health needs. Equipped with components such as a microcontroller (ESP32 or Raspberry Pi), sensors and a food-dispensing motor, the system offers features like scheduled or on-demand feeding, AI-driven health insights, and cloud-based monitoring via mobile applications. By leveraging IoT for connectivity and AI for personalized feeding, the Smart Pet Feeder enhances convenience, promotes healthier feeding habits, and provides an exemplary application of modern technologies in improving daily life.

INTRODUCTION

In today's fast-paced world, pet care can often be a challenge for busy individuals. Feeding schedules, portion control, and monitoring a pet's dietary needs are critical to their health and well-being. The Smart Pet Feeder addresses these challenges by integrating cutting-edge technologies like the Internet of Things (IoT) and Artificial Intelligence (AI) to provide an efficient and automated feeding solution.

This system allows pet owners to remotely control feeding schedules, monitor food levels, and adjust portions based on their pet's behaviour and health data. By utilizing components such as microcontrollers (ESP32 or Raspberry Pi), sensors, and cloud platforms, the feeder ensures accurate food dispensing and real-time monitoring. Additionally, AI-driven insights analyse feeding patterns and recommend appropriate portions, promoting healthier eating habits.

The Smart Pet Feeder is not just a tool for convenience but also a demonstration of how modern technology can enhance the lives of pets and their owners, ensuring timely and precise feeding while offering peace of mind to pet parents everywhere.

OBJECTIVES

- **Automate Pet Feeding:** Develop a system that schedules and dispenses food automatically, ensuring pets are fed on time.
- **Enable Remote Management:** Allow pet owners to control feeding through a mobile app or cloud platform, providing flexibility and convenience.
- **Monitor Food Levels:** Integrate sensors to track food availability and send alerts when refills are needed.
- **Implement Portion Control:** Utilize AI to analyse feeding habits and optimize portion sizes based on pet activity and health data.
- **Enhance Pet Health:** Provide insights into feeding patterns to improve dietary habits and promote better overall pet health.
- **Utilize Modern Technology:** Demonstrate the practical application of IoT and AI in everyday scenarios to improve quality of life for pets and their owners.
- **Ensure User-Friendly Operation:** Design an intuitive and easy-to-use system that can be operated by individuals with minimal technical knowledge.

PROBLEM STATEMENT

Pet owners often struggle to maintain consistent feeding schedules and appropriate portion sizes for their pets, especially when they are away from home or have busy routines. This inconsistency can lead to overfeeding, underfeeding, or irregular feeding times, negatively affecting the pet's health and well-being. Additionally, manual monitoring of food levels and feeding patterns can be time-consuming and prone to error.

The lack of an efficient, automated solution to address these challenges highlights the need for a system that ensures timely feeding, accurate portion control, and real-time monitoring of pet care. Integrating IoT and AI technologies offers a promising way to create a convenient, reliable, and health-focused solution for modern pet care.

APPLICATIONS

- **Smart Homes:** Integrates seamlessly into smart home ecosystems, providing automated pet feeding solutions alongside other IoT-enabled devices.
- **Pet Health Management:** Assists pet owners and veterinarians by analysing feeding patterns, monitoring dietary habits, and providing data-driven insights for better health care.
- **Remote Feeding Control:** Ideal for busy professionals, frequent travellers, or those who cannot always be present at home, allowing feeding schedules to be managed remotely.
- **Animal Shelters and Clinics:** Automates feeding routines for multiple animals, saving time and ensuring accurate portioning for each pet's dietary requirements.
- **Elderly and Disabled Pet Owners:** Simplifies pet care for individuals with mobility issues or other challenges, ensuring pets are fed without physical effort.
- **Research and Development:** Provides a platform for testing IoT and AI applications in real-world scenarios, contributing to technological advancements in pet care solutions.
- **Educational Tool:** Demonstrates practical use cases of IoT and AI for students and enthusiasts in technology fields, offering insights into how modern technologies can solve everyday problems.

COMPONENTS

- **Microcontrollers (ESP32 or Raspberry Pi)**

These microcontrollers serve as the central unit of the Smart Pet Feeder. The ESP32 or Raspberry Pi handle the system's operations, including Wi-Fi communication, motor control, and cloud data interaction. They act as the brain of the system, enabling remote management and monitoring.

- **Motors (Stepper Motor)**

Stepper motors are used to control the food dispensing mechanism in the feeder. These motors are precise and allow for accurate portion control when dispensing food, ensuring that the right amount of food is released according to the feeding schedule or user input.

- **Food Container**

The food container holds the pet food and is designed to feed the pet automatically when activated. The container is integrated into the system to ensure food is dispensed in the required amounts.

- **Camera (Webcam or Raspberry Pi Camera Module)**

The camera serves as an optional component for monitoring the pet or the food level. The camera can be used to provide live feed to the owner, which helps in verifying whether the pet has been fed or in tracking food levels for refilling.

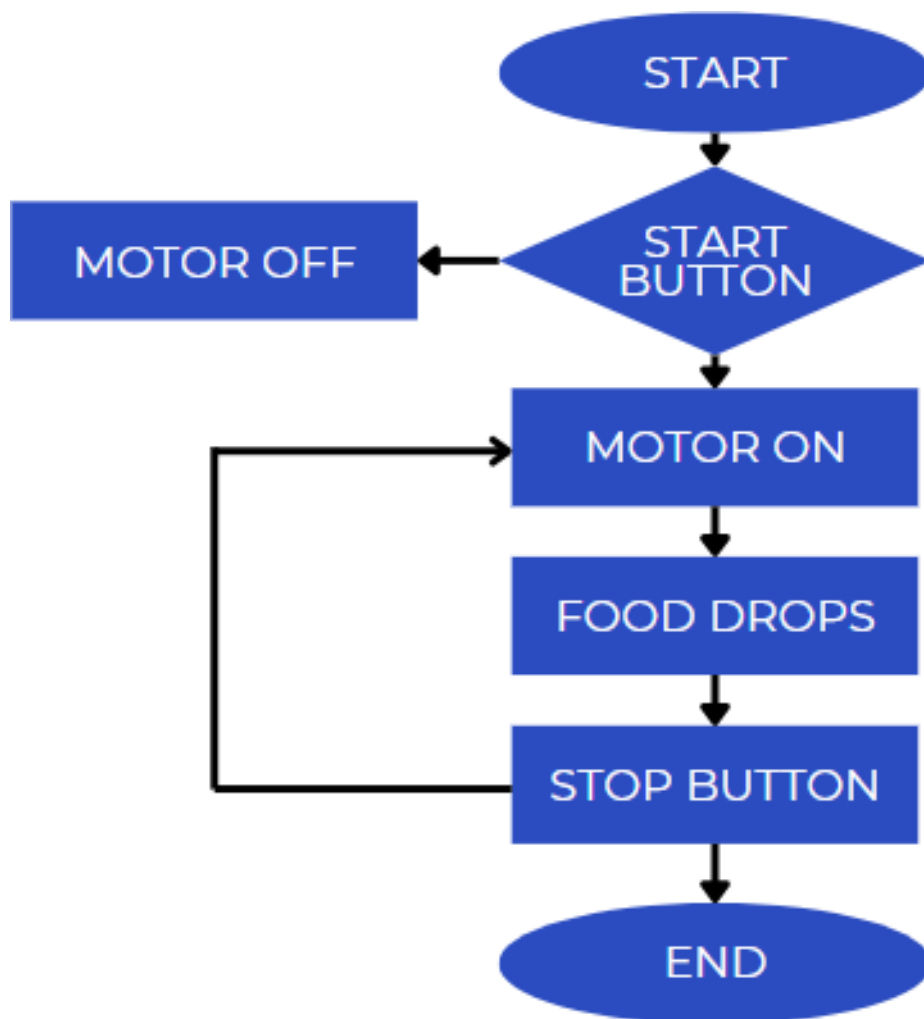
- **Power Supply (5V Adapter or Battery)**

The system is powered by either a 5V adapter or battery, ensuring it has a stable power source for continuous operation. The choice of power source depends on whether portability or fixed installation is preferred.

- **Relay Module**

The relay module is used to control the stepper motor, enabling the automatic and manual dispensing of food. It works as a switch, allowing the microcontroller to control when the motor is turned on or off.

FLOWCHART




CONCLUSION

The Smart Pet Feeder effectively combines IoT and AI technologies to offer an automated, efficient, and health-conscious solution for pet care. By enabling remote control, real-time monitoring, and AI-driven insights, the system ensures pets are fed on time with appropriate portions, promoting healthier feeding habits and enhancing overall well-being.

This project not only simplifies pet care for owners but also demonstrates the potential of modern technology to improve daily life. The integration of IoT for connectivity and AI for intelligent decision-making showcases how innovation can address practical challenges. The Smart Pet Feeder is a testament to the transformative power of technology, setting a benchmark for future advancements in automated and intelligent systems for pet care.

PSEUDOCODE

plaintext

 Copy code

```
Start Program
Initialize Components (Sensors, Motor, Cloud Services, Mobile App)
Loop:
  If (Start Button Pressed OR Scheduled Time Reached):
    Turn Motor On
    Dispense Food
  If (Stop Button Pressed):
    Turn Motor Off
    Break Loop
  Monitor Food Levels Using Sensors
  Send Alerts If Food Level Low
  Upload Feeding Data to Cloud
End Program
```