Smart IoT Pet Feeder

# Abstract

With the increasing demand for automation in everyday life, smart pet feeders have emerged as a convenient solution for pet owners to ensure timely feeding of their pets. This project proposes a smart IoT pet feeder using the ESP32 development board, which automates the pet feeding process. The ESP32 module, equipped with built-in Wi-Fi and Bluetooth capabilities, allows for remote control and monitoring via a mobile application. The pet feeder is designed to dispense food at scheduled intervals, ensuring that pets are fed on time even when their owners are away. The system sends real-time notifications to the owner, alerting them when the food has been dispensed. This IoT-based solution combines convenience with pet care, allowing for better management of feeding schedules. By integrating mobile app functionalities and ESP32-based control, this project aims to provide an innovative and efficient way to manage pet feeding while laying the foundation for future applications in smart pet systems.

# Literature Survey

## 1. IoT-Based Pet Feeding Systems

The IoT has revolutionized pet care by enabling automated feeding systems that can be monitored and controlled remotely. Research by Gubbi et al. (2013) highlights the potential of IoT in creating smart systems, including home automation and pet care. The use of low-cost microcontrollers like ESP32 in pet feeding applications is gaining momentum due to their affordability and versatility.

Relevance: The ESP32's Wi-Fi and Bluetooth capabilities make it an ideal choice for smart pet feeders, enabling real-time monitoring and remote control.

## 2. Automation in Pet Care

Automation in pet care systems, such as pet feeders, has become increasingly popular. Studies like those by Patel et al. (2020) demonstrate the benefits of automating pet feeding schedules, improving the pet's well-being by ensuring consistent feeding times.

Relevance: The proposed project uses automation to dispense food based on pre-set schedules, enhancing pet care by removing the need for human intervention.

## 3. Mobile App Integration for IoT Devices

Mobile applications play a crucial role in remote control and monitoring of IoT devices. Research by Kumar et al. (2021) demonstrates how mobile apps can be used to control and monitor IoT-based devices like pet feeders, providing convenience and ease of use for the pet owner.

Relevance: The proposed system integrates a mobile app for users to schedule and monitor the feeding process, offering an intuitive user interface for pet owners.

## 4. ESP32 in Smart Systems

The ESP32 module has been widely used in IoT applications, including smart home devices and pet care systems. Research by Patel et al. (2021) explores the use of ESP32 for remote monitoring and control in various applications. The low cost and versatile nature of the ESP32 make it suitable for a wide range of IoT-based pet care solutions.

Relevance: The ESP32's integration with mobile apps and IoT devices makes it an ideal solution for the proposed smart pet feeder project, enabling seamless communication between the device and the owner.

## 5. Real-Time Notifications in IoT Systems

Real-time notifications are essential for keeping users informed of the status of automated systems. Research by Singh et al. (2020) highlights the importance of sending real-time alerts to users when a certain action is performed in an IoT-based system, ensuring immediate awareness of events such as feeding schedules.

Relevance: The proposed project sends real-time notifications to the pet owner when the feeder dispenses food, ensuring that the owner is always updated on their pet's feeding schedule.

## 6. Challenges and Future Directions

While IoT-based pet care systems provide significant benefits, they also face challenges such as connectivity issues, data security, and power management. Zheng et al. (2018) discuss the challenges faced by IoT systems, emphasizing the need for secure communication protocols and efficient power consumption.

Relevance: The proposed project addresses these challenges by focusing on secure communication between the mobile app and ESP32 and ensuring efficient power usage for prolonged system operation.

# Summary of Literature Survey

The literature survey highlights the growing adoption of IoT and automation in pet care systems. The proposed project leverages these advancements by incorporating ESP32, mobile app integration, and real-time notifications to provide an automated pet feeding solution. By addressing key challenges such as remote monitoring, security, and power management, the project lays the foundation for future advancements in smart pet systems.

# References

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