Smart IoT-Enabled Pet Feeder – Project Report

# 1. Introduction

Feeding pets on time is a challenge for many owners due to busy schedules or travel. This project proposes an automated system that ensures pets are fed regularly using IoT technologies.

# 2. Objective

To design and develop a smart pet feeder system using IoT and Arduino that:  
- Dispenses food at scheduled times  
- Can be controlled remotely  
- Sends alerts or notifications  
- Monitors food level to avoid overfeeding or underfeeding

# 3. Proposed Solution

We developed a smart pet feeder using an Arduino UNO, servo motor, ultrasonic sensor, and LED indicator. The system can:  
- Dispense food based on a fixed schedule  
- Check food level using an ultrasonic sensor  
- Indicate the status using an LED  
- Display information through Serial Monitor

# 4. Components Used

|  |  |
| --- | --- |
| Component | Description |
| Arduino UNO | Main controller for automation |
| Servo Motor (SG90) | To open and close the food gate |
| Ultrasonic Sensor | To detect the food level |
| LED (Green/Red) | Status indicator for dispensing |
| Resistor (220Ω) | For LED current limiting |
| Breadboard & Wires | For circuit connection |

# 5. Working Process

Step-by-step flow:  
1. Owner sets the feeding time in the code (in real-world via app).  
2. Arduino waits until scheduled time.  
3. Servo opens gate to dispense food.  
4. LED turns ON while dispensing, then OFF.  
5. Ultrasonic sensor measures food level.  
6. Serial Monitor displays food level and warnings.

# 6. Tinkercad Implementation

- Circuit designed using Arduino UNO.  
- Servo motor controls gate.  
- Ultrasonic sensor connected to measure food level.  
- LED added to indicate food dispensing.  
- Serial Monitor used to display food status.

# 7. Code Snippet (Main Logic)

gateServo.write(0); // Opens the gate  
delay(2000); // Waits 2 seconds  
gateServo.write(90); // Closes the gate

# 8. Results / Output

- Food is dispensed every 10 seconds in simulation.  
- Ultrasonic sensor accurately detects food level.  
- LED glows during dispensing.  
- Serial monitor shows confirmation and warnings.

# 9. Conclusion

This project demonstrates a practical solution for pet owners using IoT. The prototype shows how automation and sensors can ensure regular and safe feeding of pets even in the absence of the owner.

# 10. Future Enhancements

- Replace Arduino UNO with NodeMCU (ESP8266) for Wi-Fi.  
- Integrate with Blynk App for remote control.  
- Send real-time push notifications to the owner's phone.  
- Add camera to monitor pet activity.