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# Pet Feeding & Food Dissipate Using IOT Technology

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**ABSTRACT:-**In the article, the utilization of IoT technology for the purpose of overseeing and regulating network-based devices is discussed, along with its practical implementation in the domain of pet care. for automation in pet feeding, and how existing automatic pet feeders often waste food. The proposed solution is to develop an automated pet feeding system that is more efficient and tailored to the specific needs of the pet. This system will use NodeMCU and various sensors to automate the feeding processes and ensure that the pet is fed in a timely and efficient manner. The main objective of this research work is to improve pet food care through the use of IOT Technology.

**KEYWORDS:** -ThingSpeak , Arduino UNO , IoT base , RFID sensor and Ultrasonic sensor, IR sensor, RFID Tag.

## I. INTRODUCTION

The text describes how pet feeding can be a difficult and time-consuming responsibility for pet owners for pet owners, especially those with busy personal lives. The solution to this problem is an automatic pet monitoring and feeding system that utilizes Internet of Things (IoT) Technology. The current issue with existing pet feeders is the amount of food that is wasted. The proposed system aims to address this issue and provide an efficient solution for pet food care. With using the IoT technology, the system will be able to monitor and feed the pets without the help of human interference. This will allow pet owners to take good care of their pets even when they are busy, while also avoiding wastage of food. Overall, the main aim of the project is to provide a practical and effective solution for pet feeding and care.

### *Existing System :-*

An IOT Pet feeder is one of the pet feeders that will be controlled by a mobile application through the internet, but in this system we don't require any mobile application. IOT based pet feeder is designed to be controlled by the Google Assistant to feed and says "Okay Google, Feed My pet". But this pet feeding system is hardware design using mechanical parts for opening and closing of the food container and software code which is used to program the Arduino. The pet feeder system takes up the pre-defined time. Food falls down from the container into the bowl at a specific time. But in the system, wastage of food happens at every time.

The main purpose of the proposed system is to avoid food wasting using ultrasonic sensors.

### *Motivation :*

The text describes the benefits of using an automatic pet feeder system to take care of a pet's diet when the owner is not at home. The system allows the owner to feed their pet from anywhere and with just a single click, it can be done anytime, making it a convenient solution for busy pet owners. That system is controlled by a mobile application through the internet, and is classified as an IOT pet feeder. This type of pet feeder utilizes new technologies to provide an easy and efficient way for pet owners to fulfill their pets' dietary needs. Overall, the text highlights the convenience and advantages of using an automatic pet feeder system for pet care.



II. SYSTEM ARCHITECTURE

This is the System Architecture Diagram

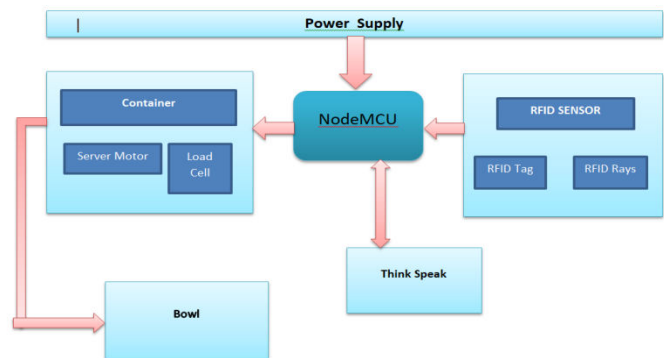


Fig. 1. System Architecture

Arduino Integrated Development Environment(IDE):

The text explains that the Arduino Integrated Development Environment (IDE) consists of a text editor that enables the user to write code., a message area, a text console, a toolbar with common function buttons, and menus. The IDE is used to write and upload code to Arduino Board, and is open source software that is compatible with Windows, Mac OS X, and Linux. The IDE supports programming languages such as C and C++. Code written in the arduino IDE is referred as a “sketch”, which can be uploaded to the Arduino board after it is connected to the IDE. Sketches are saved with the ‘.ino’ extension. Overall, the Arduino IDE provides a user-friendly and versatile environment for programming and communicating with Arduino board.

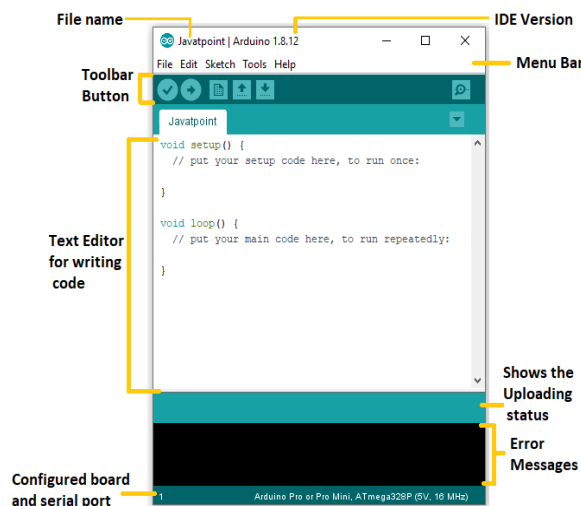


Fig. 2. Arduino IDE

ThingSpeak :-

ThingSpeak is an open-source Internet of Things (IoT) platform that allow users to collect, analyze, and act on sensor data from a variety of sources. It provides a way to store, visualize, and analyze data streams in real-time. The platform is based on MATLAB, which allows users to perform complex analysis on their data. ThingSpeak also provides an API

that allows users to send and receive data from their device, as well as access their data from applications. The platform supports a wide range of devices and protocols, including Arduino, Raspberry Pi, ESP8266, and MQTT.

ThingSpeak also allows users to create custom applications and dashboards using MATLAB scripts or third-party plugins.

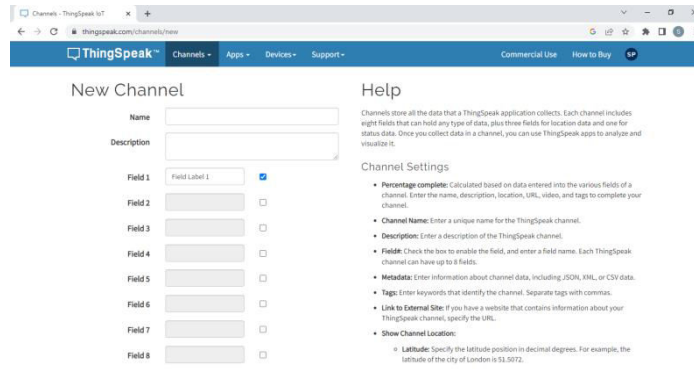


Fig. 3. ThingSpeak

## System Implementation Plan

### 1. To examine the manual pet feeding method and devise a proper feeding method.

That sounds like an interesting project! It's great to see the combination of hardware and software to develop a program for automating pet feeding using Arduino and NodeMCU software..

The Arduino is a well-known hardware platform with open-source features, which offers a user-friendly development environment for building interactive projects. It has a variety of input and output pins that can be used to control and interact with different electronic components such as sensors, motors, and displays.

NodeMCU is a low-cost Wi-Fi microcontroller that is based on the ESP8266 chip. It provides a convenient way to connect to the internet and interact with other devices in a network. It also supports various programming languages, including Lua and C++, which makes it flexible and easy to use.

Combining Arduino and NodeMCU can lead to a powerful and versatile system for controlling different types of devices, including sensors, actuators, and communication modules. It can be used for a wide range of applications, including home automation, robotics, and IoT projects.

### 2. To design a tracking system by using RFID tag and RFID reader. How RFID works?

Yes, that's correct. In order to implement an RFID system, we need a power unit, control unit, EEPROM, transmitter, and receiver block. These components work together to allow the RFID tag to communicate with the reader and transmit data.



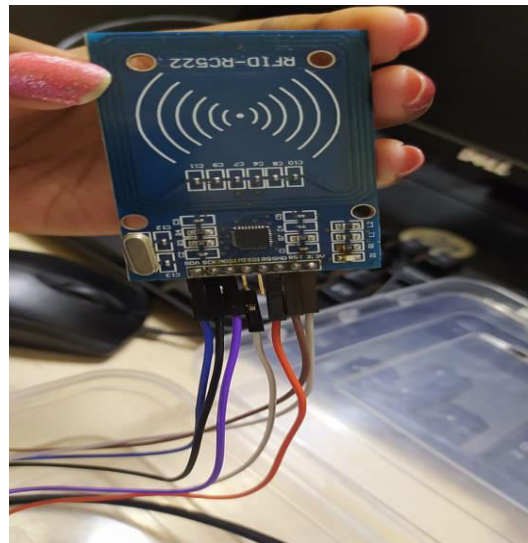


Fig. 4 .RFID Reader

To install an RFID tag on a pet, the tag can be attached to a collar or harness worn by the pet. When the pet enters the range of the RFID reader, the reader will detect the tag and read its ID number. The range of the reader can vary depending on the type of RFID system and the strength of the signal.

The RFID tag consists of a coil, a smart chip, and an ABS material housing. The coil is used to receive and transmit signals between the tag and the reader. The smart chip contains the data ID that is transmitted by the tag, and the EEPROM allows for new data to be added or updated as needed. The ABS material housing provides protection for the components inside the tag.

In general, RFID tracking systems can serve as valuable instruments for pet owners to track and monitor their pets' location and movement. Besides, these systems have diverse applications in industries, such as inventory management, access control, and others.

**3.The goal is to create an automated system by integrating a real-time clock, a servo motor, and a load cell device.**

In the pet feeding system, a servo motor is connected directly to the container to pour food into the bowl by rotating an output shaft to a specific angular position. Users can manually set the time for pouring food using a 2x2 matrix keypad that controls the servo motor. Additionally, a load cell device can be used to measure the amount of food dispensed into the bowl, enabling the user to monitor and adjust the quantity of food their pet receives. The type of load cell used in the system would depend on specific design requirements and the weight or force measurement needed. Load cells come in three main types: hydraulic, pneumatic, and strain gauge, and are categorized based on their mechanism for converting mechanical force into an electrical or digital signal.

**4.The aim is to utilize an ultrasonic sensor to measure the level of food and minimize wastage in the feeding system.**

A metal block can be utilized to cover and secure the pet feeding system's circuit to protect it. Moreover, a plastic container can be used to preserve the food and avoid contamination by unwanted objects. The HC-SR04 ultrasonic sensor is a popular distance-measuring sensor that operates by broadcasting waves at a frequency of 40,000 Hz from an ultrasonic transmitter and detecting the waves that bounce back off of objects in its path with an ultrasonic receiver. The control circuit calculates the time it takes for the waves to return and determines the distance between the sensor and the object that reflected the waves. In the pet feeding system, the ultrasonic sensor can be utilized to identify when the food container is running low and activate the system to dispense more food.

### III. RESULT

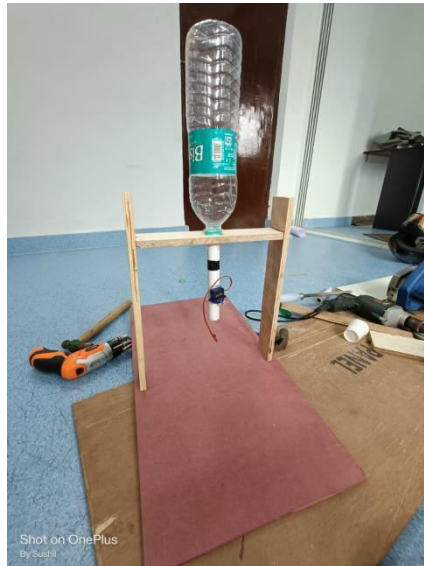


Fig. 5 . Structure of the system

The pet name provided by us will be displayed on the 16x2 LCD after the code has been uploaded to the Arduino IDE. Since when a pet is detected by the system, the display will show "WELCOME PET (NAME OF PET)".

Now, if a pet is detected in the system by the EM18 RFID reader module using the RFID tag of the pet, The servo motor then rotated from its initial position of 0 degrees to 180 degrees, and it returned to its initial position after a certain delay. Every time the servo motor opens and closes, the feeding time and the food level of the food container will be uploaded on Thinkspeaks for analytics, which include the time and date of the food spill.

Once the food from the food dispenser falls into the feeding bowl of the pet, When an IR sensor is placed, the amount of food is monitored and overfeeding is avoided. When food remains in the bowl, the system does not dispense the food as the pet is detected by once again.

The food container has three IR sensors for monitoring the food level.



Fig. 6 . Main System



#### **IV. CONCLUSION**

That's The automatic pet feeding system provides an excellent solution for pet owners to ensure their pets receive the correct amount of food at the right time, regardless of their absence from home. This system can also reduce overfeeding and food wastage, which are prevalent issues in many households. In summary, the automatic pet feeding system is a practical and efficient method for pet owners to establish a dependable feeding schedule and minimize foodwaste, providing a convenient solution for pet care..

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