Sri Lanka Institute of Information Technology

IT1040 - Fundamentals of Computing

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<Smart Pet Feeder>

Proposal Document

< P3 - 17 >

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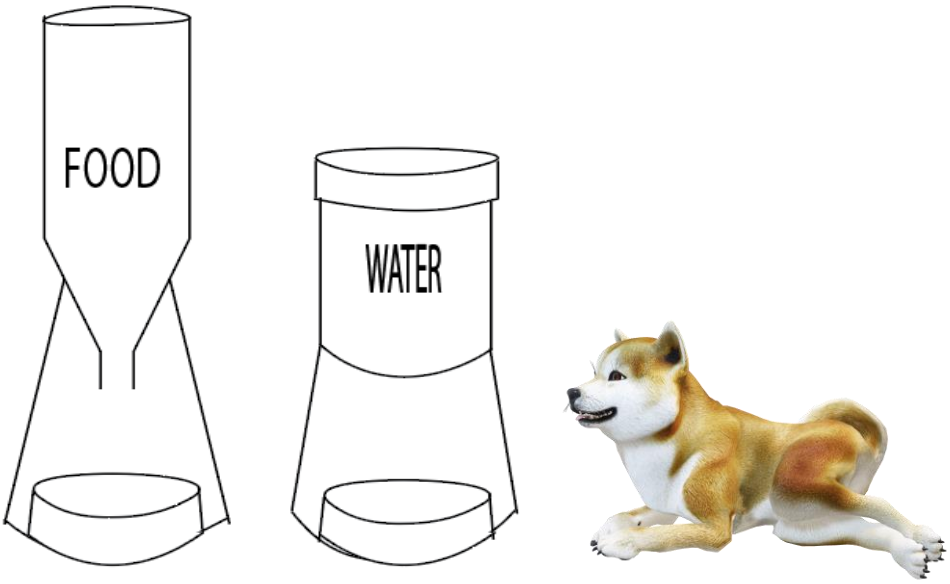
Contents

Smart Pet Feeder

Feeding No More: The Smart Pet Feeder Innovation

In this 21st century most people are buying pets to relieve stress from a hectic work schedule. However, earning money also became challenging. In this hectic era, most pet lovers are worried about pet feeding. Therefore, more attention is paid to the well-being and health of pets while taking care of them. Nutrition is important as a major part of it. Feeding on a daily schedule is essential to maintaining pet health. But pet owners nowadays are too busy to feed their pets on a schedule. As a result, pets may suffer from reduced nutrition and disease.

As a solution to this problem, we can introduce a smart pet feeding system. The system allows pet owners to ensure that the pet receives food on a schedule even when they are not at home. It is also a reliable and convenient method. This system ensures the nutritional status of the pet. Let's dream of a world where your pet's meals are always on schedule, no matter how hectic your life becomes.



Smart pet feeding systems are often designed for busy pet owners. The system can be controlled through a smartphone. This offers features such as remote functionality and feeding timers. These features make pet care simple.

Problem and Motivation

Problem- The Challenge of Modern Pet Ownership

Nowadays feeding pets has been a big challenge for pet owners in their day-to-day life. Both pets and pet owners are suffering from different causes due to those challenges. In modern day everyone is busy with their day today. Sometimes pet owners are not able to feed their pets at the right time. This can badly affect the health, growth and energy needs of your pets. So, feeding pets on time is a very important thing. Most pet owners with busy lives are facing this problem in today's life. So, they must spend more time and money on their pets. If you have multiple pets, the situation can worsen. You must make sure each pet gets the correct food on time as additional work. Balancing work in day today's life, balancing personal life with a pet feeding schedule can be difficult. If you must go far away from home, you can't monitor pet feeding schedule according to your routine.

Automated Pet Feeding: A Solution for Modern Life

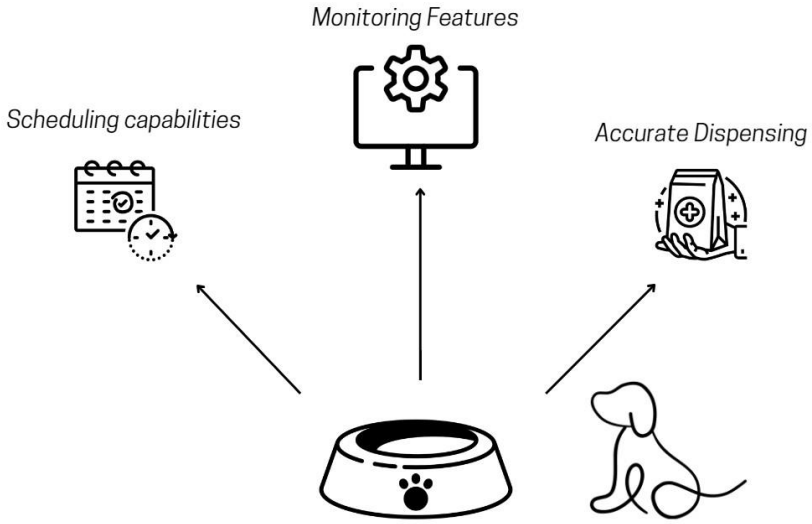
Automated pet feeding systems are the best solution for the above modern problems related with pets and pet feeding. Automated pet feeding systems can make your life easier than before, and it makes a good environment for pets as well. By using automated pet feeding systems, you don't need to reserve your time to feed pets. Automated pet feeder is working according to the schedule. The only thing that you need to do is make a schedule. And the pet feeder will do the rest. Automated pet feeders ensure pets receive their food according to scheduled time. This pet feeding system is very helpful to people with busy lives. If you cannot feed pets on time because of your work, it's not a problem anymore even if the owner is not at home. This is very useful for those who travel or work far away from your home. And the other thing is that pet feeder systems can control the number of potions. It is solving overfeeding issues and giving a sufficient portion of food. By using automated pet feeders, you can manage your pet's food consumption and you can monitor your pet's eating habits. automated pet feeding systems reduce unwanted behaviors of pets such as begging. When pets are familiar with schedules. By managing a pet's food consumption, an automated pet feeding system helps you to minimize food waste.

Aim and objectives

Aim-

The Smart Pet Feeder is designed to be your pet's personal chef and co-owner. It's more than just a food dispenser; it's a technological friend, ensuring your pet is well- cared for and to create a dependable smart pet feeding system that feeds the pet at specific times.

- We try to provide three objective features from this project



Objectives 1

· Scheduling Capabilities

Ensure consistent feeding times by setting feeding schedules in the software interface.

Key features:

- user-friendly interface
- Notification system
- backup schedules

Objectives 2

· Accurate Dispensing

Provide precise food portions by preventing overfeeding or underfeeding

Key features:

- Consistency
- Measurement mechanism
- Adjustable portion sizes.

Objectives 3

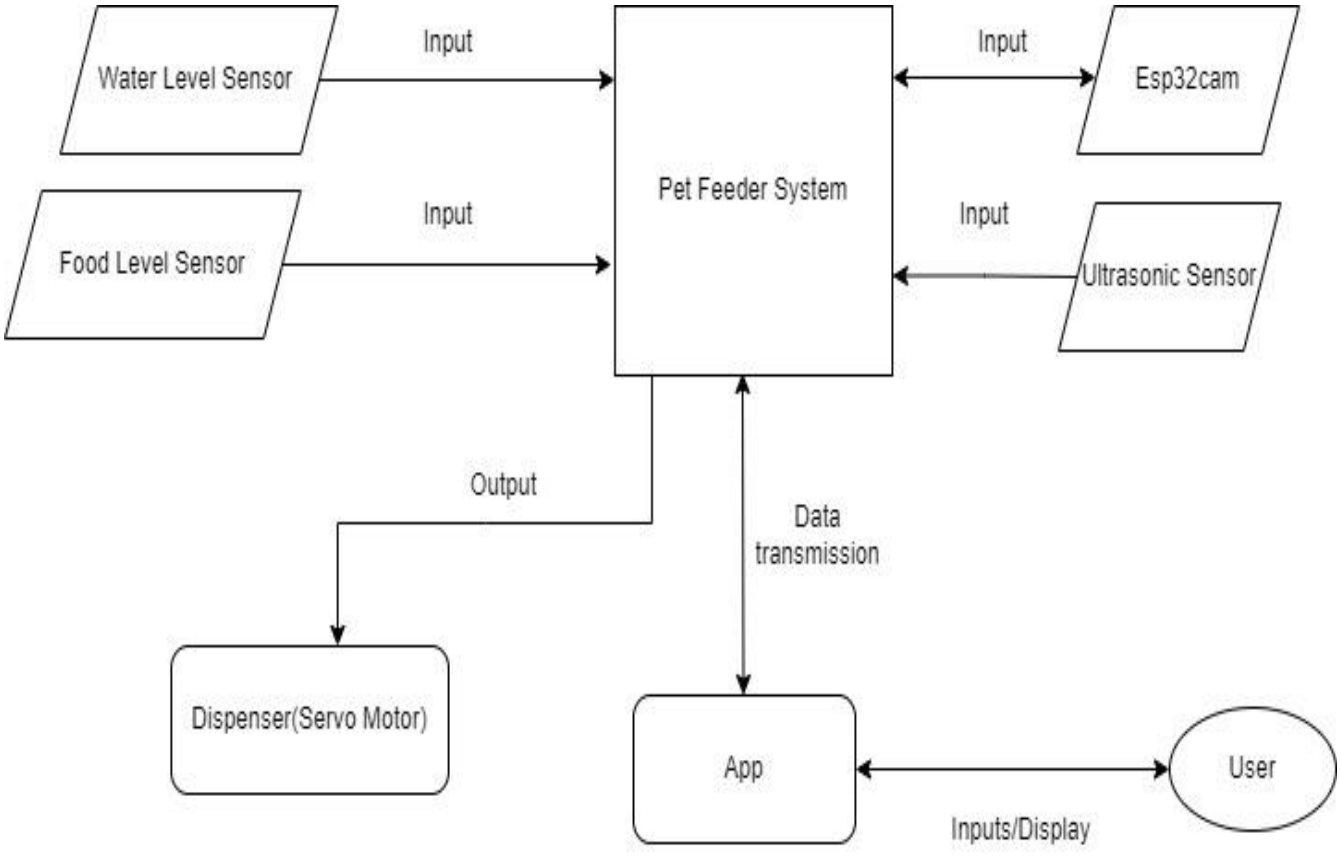
· Monitoring Features

Enabling sensors and camera and to monitor empty containers

Key features:

- Empty container
- Pet observation

System Diagram



Methodology

A smart feeder automatically dispenses pet food at predetermined times. It is involved in a combination of hardware and software components.

Here is a general methodology for developing this system.

1. Hardware development
2. Software development
3. Feeding algorithm
4. User Interface

1) Hardware Development

Servo Motor is used for the locking system. It will be like the locking system controlled by angle
Ultra Sonic Sensor is to monitor water level
ESP32 cam module is used to monitor food and pet
Bread board- to make connection
Arduino board-
Bluetooth sensor-to make connection between application
Resistors, Capacitors and Transistors are being part of this circuit
All these components were together combined to Arduino running smart pet feeder.

Sensors as Input

Ultrasonic Sensor: Monitors the water level in the water dispenser.
ESP32 Cam Module: Monitors food levels and possibly pet activity.
Bluetooth Sensor: Receives commands from the mobile application.

Actuators as Output

Servo Motor: Controls the locking system for the food dispenser.

Memory for Data Storage

the Arduino board typically has built-in memory that can be used to store:

2) Software Development

Mobile app

- develop an app for iOS and Android to:

- Set feeding schedules
- Monitor food levels
- View camera feed
- Monitor pet's diet

Website

-We will be trying to develop a website, if the time limit allows (not promised)

3) Feeding algorithm

Portion Control

-controls the portion of food dispensing

-avoid underfeeding or overfeeding

Scheduling

-dispensing food on flexible time

-having option to feed in software

4)User Interface

Physical interface -design a clear and user-friendly interface to user

Mobile app interface-provide easy operated and visually appealing user-friendly interface

Evaluation Method

As a Smart Feeder, it can be evaluating three system in once such as Feeding, water level controlling and Monitoring system

FEEDING SYSTEM

Three meals will be automatically served according to the time set in the app. In this system, food will be automatically filled into the food container with the help of a servo motor.

WATER LEVEL CONTROLING

The water container has an ultrasonic sensor to monitor the water level. It checks the water level, and if it drops below a certain level, it will automatically refill.

MONITORING SYSTEM

A camera is inserted into the system. So, it allows users to monitor their pets via the app. So, they can check whether their pets eat well or not.

Additionally, this system is connected to the app to control the water level and feeding system. If the user wants to fill the food and water to the containers, they can fill them by the app.

References

https://www.arduino.cc/en/Guide

https://www.arduino.cc/en/Tutorial/HomePage

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As a conclusion, this project helps to develop creativity and modify existing projects to be more efficient with new methods. And this will be helpful to gather knowledge in electronic side and app development areas. This smart pet feeder innovation makes it easy for consumers to feed their pets and will not leave their pets hungry again. The effectiveness of the project increased while feeding pets provided a camera to make it easier for users to see their pets inside the mobile device. This smart pet feeder serves as a helping hand as it works efficiently in the absence of its own.