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PET CARE UNIT USING IOT

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Abstract - "In recent time, pets are treated as their family members. We'd like to feed our pets in time, whenever the pet owner is outside the residence, busy on work unable to feed their pets. Therefore, this technique helps in feeding pets anytime from anywhere automatically by the owner through the module of pet care system using IOT. It meets the wants & needs of homeowners, as this may assure pet owners and increase comfort and peace of mind. This also helps to forestall obesity of pets and trains the pets for schedules meals, hence this technique is incredibly useful in order to take care of the pets in the right and also the healthy way and is thus very convenient to the owner. The unit feeds the pet automatically based on the time set by the pet owner. The owner can use a mobile application in order to set the feed time."

Key Words: Pet care, Microcontroller, motors, automatic food dispenser, IoT.

1. INTRODUCTION

In recent time there are more IOT connected devices than humans. The web of things promises many positive changes for health and safety, business operations, industrial performance global environmental and humanitarian issues. IOT has made it possible to sense and control the physical world by making objects smarter and connecting them through an intelligent network.

The proposed model uses the technology of Internet of Things (IoT). In recent years, the number of pet owners has drastically increased but due to the busy work life, the owners fail to take care of their pets the right way. In cases when the owner is absent at the place of residence this model can be used. By using pet care system, the owner can feed the pet automatically from anyplace at any time.

The owner can record his/her voice and make it audible to their pets and also the owner can track the pets within the particular area. Through this technique the owner can protect the pet's health and stop them from illness, diseases and obesity. As they're able to pre-set time, the pets get fed in scheduled time. Hence this helps the owner as they will be sure of their pets and feed them on time from anywhere. Therefore, the pet care system using IOT is effective in various aspects.

2. LITERATURE SURVEY

In the pet care market, there have been numerous smart devices applying IoT technology to satisfy various pet care needs. By studying the products of pet care , we find that the food feeder, water dispenser, and the litter box, the most advanced and mature applications of IoT technology is the pet feeder, which usually contains functions like automatic feeding controlling, real-time monitoring, or consumption reporting [2].

Ankush Paryani [1] designed a system for feeding the pets; the system information on stocks, the feed schedule, waiting time required/taken and also the owner's name from server which uses MQTT protocol. The system performs the feeding process using RFID (Radio Frequency Identification). Besides, when we are looking for a holistic approach in a system of monitoring and controlling these devices, we found that there is a gap in the market. For example, some pet care applications like the Petsafe [6] only provides a food feeder application, instead of establishing it by including their water dispensing products and litter boxes. Another example is OurPets [3], it provides a smartphone application which combines their feeding, drinking and litter box products. However, these Bluetooth-connected devices have a communication range which is very limited. Moreover, these Wi-Fi converters requires the customers to purchase it separately, thus making it costly and inconvenient.

Deepak Patil [4] has proposed a system to locate pet animals in small cities. As we know, pet animal monitoring in small cities is a challenging problem. Few of the classic approaches to identify the animal surveillance techniques include air tags, GPS, and RFID. It proves to fail providing the full required level of monitoring and tracking of the pets. These devices have many limitations and costly. They have an approach of pet animal tracking on the video stream using deep learning capabilities with the goal to detect and classify the object of interest.

3. ARCHITECTURE

In this phase of implementation and architecture, the following is the hardware design that has been implemented.

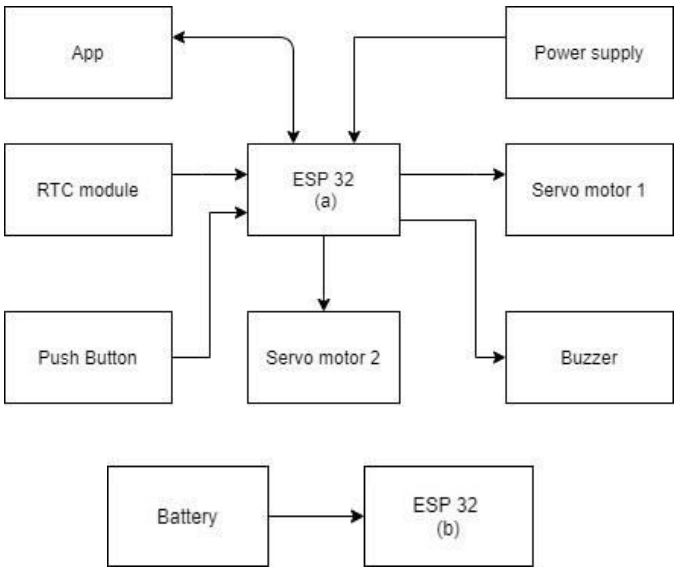

Figure 1: System design architecture

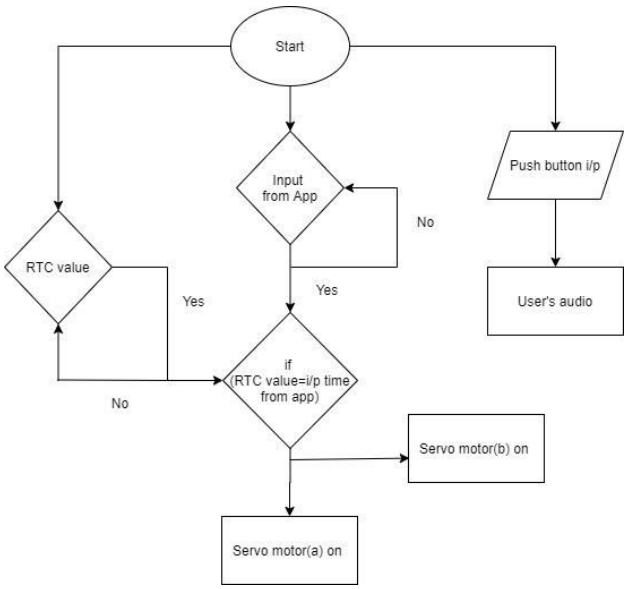

Figure 2: Flowchart

Figure (1) shows the system design architecture of the proposed model. The components used are as given below.

(i)Arduino IDE: It's an open-source arduino software for developing IOT projects because they contain an outsized set of common input and output functions. The program could be written in any of the programming languages such as python, C or C++.

(ii)ESP 32: It's a microcontroller IC which controls all the components within the system which supports Wi-Fi and Bluetooth.

(iv)ESP-32 (b): It is a module (microcontroller) in the pet's belt that will be used to monitor the pet's movement.

(v)Application: A smart phone application that helps in feeding and monitoring the pet.

(vi)RTC module: Real Time Clock is used to automate the feeder based on the time set by the owner.

(vii)Power supply: Source of power to the ESP-32(a) controller.

(viii)Battery: Source of power to the ESP-32(b) controller.

(ix)Servo motors: It is used to control the food dropper.

(x)Push button & Buzzer: The pet can press the button to alert the owner.

The microcontroller is attached to the feeder and controls the servo motors that in turn controls the 2 feeders. During this proposed architecture the feeding module administer one DC motor, two servo motors which is able to act as a switch for the feed container. When the owner presses the feed button on his android smart phone the servo motor will rotate a flap, and hence the food falls along the slope into his feed collector. An external power is to be provided to remain the motors in working conditions.

4. FLOWCHART AND ALGORITHM

The figure (2) shows a dataflow of the proposed model. Based on user's input using a mobile application the motors are activated. Given below is the algorithm of the proposed model.

Step 1: Start of mobile phone application

Step 2(a): Input given by the user through the application.

Step 2(b): Input from the RTC module.

Step 2(c): Input from the push button then plays a pre-recorded audio

Step3: if input from RTC module = input time

servo motor is triggered

else it is not triggered.

5. PROPOSED MODEL

The basic functions of automatic feeder is generally the identical with the merchandise that we are able to find within the market. The difference is laid within the communication ability and the sensing ability. We've designed the automated feeder with the buzzer and time. It can measure the quantity of the food and check the measure. And it can act on time basis with the timer set.. Users can set the regular interval of feeding time for his/her pets. Additionally, users can set the amount between meals. As there're over one food dropper being controlled by the microcontroller, this model will be accustomed feed to pet over once in a very day. The setting can be done through user's smart phones furthermore.

A mobile(smart) phone application is employed that helps in feeding and monitoring the pet. The RTC module which may be a Real Clock is employed to automate the feeder supported the time set by the owner. The power supply to the ESP 32(a) controller is given by an adapter. The ESP 32(a) is a module (microcontroller) within the feeder that happens to control the servo motor, button and RTC module that has integrated Wi-Fi and dual-mode Bluetooth. The battery is that the source of power to the ESP 32(b) controller. The ESP 32(b) could be a module (microcontroller) within the pet's belt that may be used to monitor the pet's movement. The servo motor are used to control the food dropper supported time stamp received from the RTC module the food dropper then drops food into the bowl. The push button are often employed by the pet. It can press the button to speak with the owner. The buzzer alerts the owner as it also sends a notification to the owner's smart phone.

The ESP 32(b) microcontroller, in the pet's belt that is used to monitor the pet's movement. The RTC module can be used to set a particular time for the food dispenser to drop the food into the serving bowls. The RTC module communicates with servo motors using integrate Wi-Fi and dual-mode Bluetooth. The SD card module is used to store the owner's audio messages. So, when the pet presses the push button the owner's audio message is played through the speakers.

6. CONCLUSION

Every pet owner's lifestyle is not the same, some may use their residence in the house to feed the pet, but some may not have residence or time to feed their pet, this proposed pet care system is the solution to the problem and helps taking care of their pet more conveniently. To conclude, the present project implements an IOT-based pet care system applying several sensors and actuators on three devices (food dispenser, SD card module and pet monitoring unit). We have developed a mobile application for pet owners which act as an interface between pet owner and pets.

7. REFERENCES

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