



AUTOMATIC PET FOOD DISPENSER USING DIGITAL IMAGE PROCESSING

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Abstract: Unlike previous versions of pet feeders, this project design aims to enable pet owners to feed their pets/pets without presence or interference. Our mission motive is to provide an easier and more efficient way for pet owners to feed their pets, even when they are not at home now and can no longer manage from a distance. This system is realized using digital imaging. An ultrasonic sensor is placed on the first pet to detect the pet in front of the system. When a pet is detected, the camera turns on and captures and processes an image of the pet. When a pet is recognized as a must-have, the DC motor kicks in to provide the food. I have implemented a project for two pets of different breeds. Therefore, we used two DC motors to dispense 2 types of food to 2 different pets. Therefore, two food containers and two feeders are provided in this design. After feeding the required pet, a message is sent to the owner's mobile number using the API.

Keywords: Automatic Pet Feeder, Arduino IDE, Smart Home, Digital Image Processing, Neural networks.

I. INTRODUCTION

Today, people tend to be busier and because of their existence, they tend to overlook some of the obligations that can be a major reason for their problems. One of those commitments is keeping a puppy at home is to keep Most people want their pets for their attractive looks, loyalty and playful personality. Having a puppy is a joy for the family and for the employer, so having a puppy is a responsibility that is not wasted. Giving A big problem in society is how busy people are. This is one of the main reasons why puppy owners act irresponsibly when it comes to pet care. Your pet seems to be at the bottom of your priority list. An important element in puppy care is feeding. This is where this challenge comes into play, where feeders based primarily on digital image processing are activated with pet detection and recognition. Our mission motivation is to provide an easier and more efficient way to feed pets, even when pet owners are away from home and cannot operate remotely. Specifically, develop a design that automatically recognizes a specific pet, makes the recognized pet healthy with the most recent saved pet profile, and provides that person with the correct amount and type of food. The purpose is that. The important point is that feeders can help different kinds of pets. The food box and food plate are all separate so you can add different ingredients for each pet. Artifacts have made great strides in overcoming the problems between human and machine capabilities. Specialists and fans alike hack different parts of the field to achieve amazing things. One of many such areas is the computer vision space. The motivation for this field is to enable machines to see the world the same way humans do, see the world in the same way, and use the information for a variety of tasks such as: B. Image and video review, image analysis and classification, media restoration, recommendation systems, natural language processing, and more. Advances in computer vision through deep learning have basically evolved and idealized over time beyond the specific computation of convolutional neural networks.

II. OBJECTIVES

The purpose of this project is to develop an automatic feeder for feeding pets. This project aims to have a dairy, poultry farm, and home pet perspective. Maintaining animal as well as human nutrition is important for dairy farms to produce better milk and improve quality, and for chicken farms to keep eggs and chickens healthy. These days, anyone can have a pet at home without paying attention to having a healthy pet. With this feeding machine, pet owners can better manage their pet's diet. When the user is at home, it can be controlled via her mobile application on the internet. A timer can be set to feed the pet when the user is not at home. A sensor is activated to detect the exact amount that should be in the bowl to ensure the food does not exceed the force. When you go to work or travel for work. We always end up paying a lot of money to pet sitters to feed our pets. We realized that adapting the pet automatic feeder to her IoT application would not only solve our problem, but also benefit other pet owners.



III. APPROACH

This process Detect, localize, and recognize animals in images. Animal detection can be done in several ways, such as feature-based object detection, Viola Jones object detection, SVM classification using HOG features, and deep learning object detection. The figure above shows a proposed block diagram for project implementation. The Arduino IDE is the controller used by the system.

The Arduino IDE is a built-in system and used the board as an inexpensive single board computer used to reduce system complexity in real-time applications. First, the project plays a recorded voice through the speaker to announce that pet feeding time is about to begin. An ultrasonic sensor is placed in front of the pet detection system. As soon as the ultrasonic sensor detects a pet, it turns on the camera connected to the PC to capture and process the pet's image. When it determines your pet needs it, the DC motor kicks in and dispenses the food. A DC motor rotates to provide food and rotation is controlled by an H-bridge. You can control your pet's diet by providing the right amount of food. This is done by controlling the rotation of a DC motor. A strain gauge is then used to detect the presence of food in the bowl. The load cell detects that your pet is being fed and sends a message even if the food starts to fall below the set point. This system has been implemented to feed pets of the same or different species using image processing. Ongoing projects are for different species of pets. Therefore, we used a DC motor to feed different types of food to different pets. Thus, this design provides a feeding container and a feeding bowl. When the required pet is successfully fed, a message is sent to the owner's mobile phone number via the Twilio API and via the MCU node to Telegram. Pet detection and detection is done using convolutional neural network methods. To train a model, you must first create a dataset. The TensorFlow object detection API uses the TF record file format, so you need to convert your dataset to this file format. TensorFlow is a free and open-source dataflow software library. There are two things to consider when preparing an input file for an API. 1) Images must be in JPEG or PNG format. 2) I need a list of bounding boxes for the image and the classes of objects within the bounding boxes.

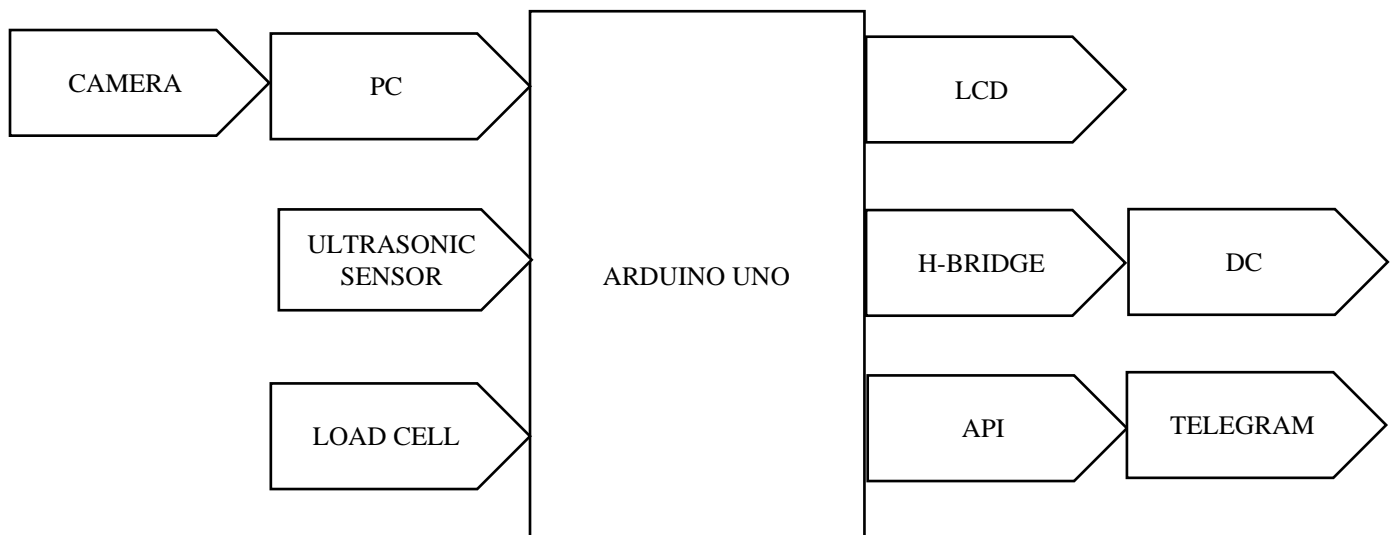
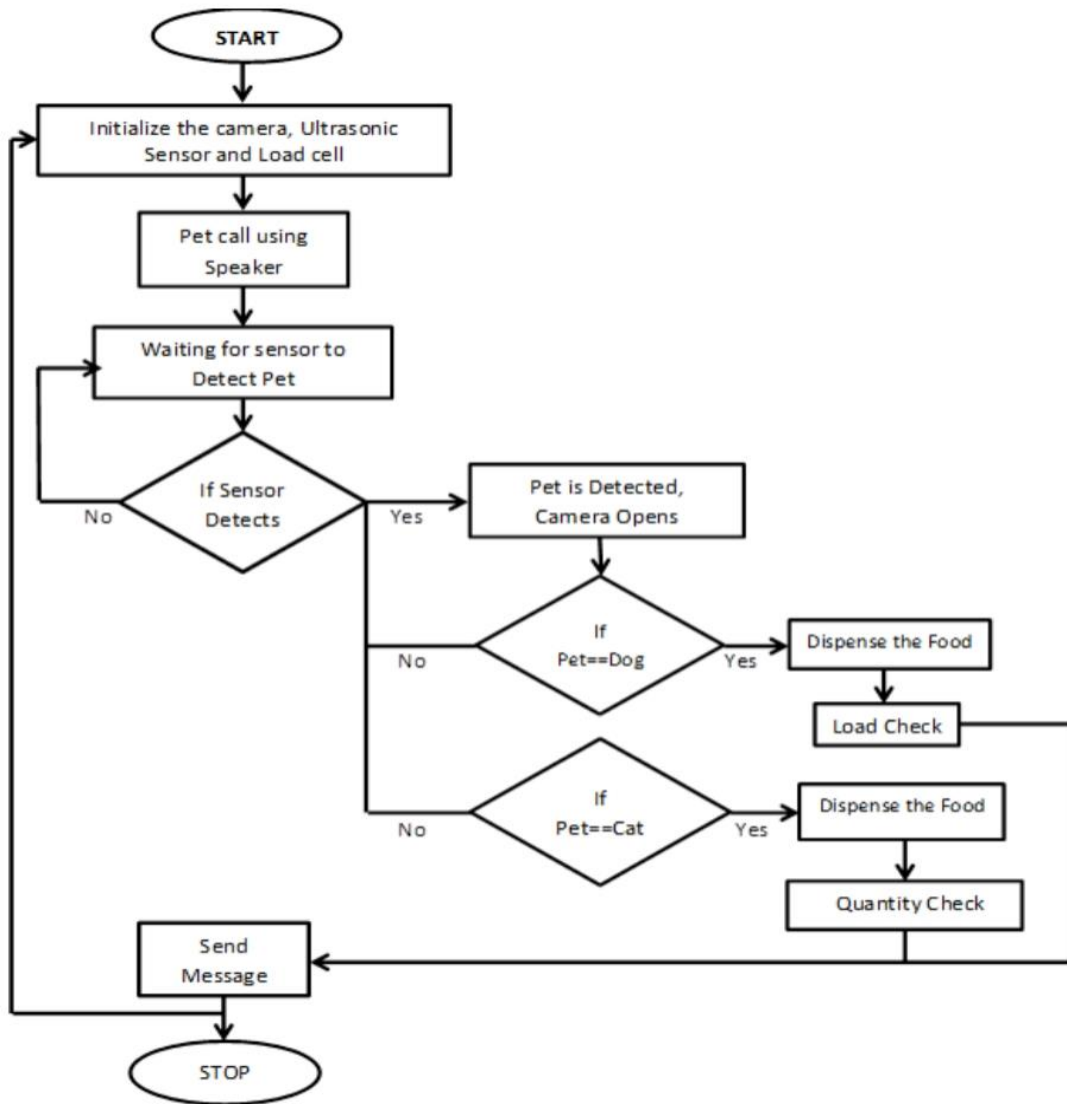


Fig 1: Block diagram of automatic pet food dispenser



IV METHODOLOGY



IV. RESULTS ANALYSIS





V. CONCLUSION

The project we did involved feeding two pets of different species. However, this design is made to house one or more domestic animals of the same or different species. Products and designs can be modified according to the needs of one or more pets. This pet tray design provides some other features that will be more convenient for owner and pet such as feeding time, interval between consecutive meals, calling pet when it's time to feed and controlling amount of food served. The system also sends text messages to owners about successful feeding of each animal using the API.

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