



IOT BASED AUTOMATIC PET FEEDER

Prof. Manjula N¹

Manohar R², Madhu K M³, Karan R Gowda⁴, Jeevan G N⁵

Assistant Professor, Electronics and Communication, Dr. Ambedkar Institute of Technology, Bangalore, India¹

Student, Electronics and Communication, Dr. Ambedkar Institute of Technology, Bangalore, India²⁻⁵

Abstract: Facial A new design of pet feeder is proposed which can be controlled by interactive remote controller which helps to get rid of the manual settings of the previous versions of pet feeder. This design contains many new features as compared to the previous versions. In this design user can adjust the feed time, time gap between consecutive feeds and the quantity of feed served. This design also contains the call for pet at feed time, refill alert, dual power supply with battery charger, Massage alert system for owner in case of pet don't get it's feed, safety lock for container, sensor based system to serve previously served feed in case of left feed and the priority feeder with dual option of serve as by owner can opt for multi time and pet can opt for 1 time between feed time gap.

Keyword: Microcontroller, Image Processing, H-Bridge, Python, Sensor, Servo motors, Message.

I. INTRODUCTION

In the recent years, Nowadays, people tend to be busier and due to this beings tend to overlook additionally a number of their obligations which might be the primary purpose of trouble One of those obligations is having a puppy at home. Most humans need to have their personal pet for its appealing appearance, loyalty and playful personality. Having a puppy is a responsibility which doesn't go into waste because having a puppy serves enjoyment and employer at domestic One foremost trouble within the gift society is the people's busyness. It is one major reason why puppy proprietors devote irresponsible deeds with regards to looking after their pets. Their pets appear to be on the bottom listing of their priorities. One important factor on puppy care is feeding. This is in which this challenge is available in movement in which a Digital Image Processing primarily based food dispenser will be activated on pet detection and recognition. The motive of our mission is to offer a simpler and extra efficient way for the pet owners to feed their pets, even when they may be now not at domestic and when they are no longer capable of manipulate remotely. Specifically, the purpose is to construct a design which can automatically discover specific pets, healthy the detected pets with the modern stored pet profiles and dispense the right sort of meals at the person precise quantity. A critical point is that the pet feeder can help pets from distinct species. The meals boxes and food plates are all separate in order that the person can put distinctive ingredients for distinctive pets. Man-made has been seeing a grand development in overcoming any issues between the capacities of people and machines. Specialists and fans the same, chip away at various parts of the field to cause astonishing things to occur. One of numerous such regions is the space of Computer Vision. The motivation for this field is to empower machines to see the world as people do, see it likewise and even utilize the information for a huge number of assignments, for example, Image and Video acknowledgment, Image Analysis and Classification, Media Recreation, Recommendation Systems, Natural Language Processing, and so on. The progressions in Computer Vision with Deep Learning has been developed and idealized with time, fundamentally more than one specific calculation a Convolutional Neural Network.

II. METHODOLOGY

Animal Detection is the process of finding real-world animals in still images or Videos. It allows for the recognition, localization, and detection of animals within an image. Animal Detection can be done via multiple ways: Feature-Based Object Detection, Viola Jones Object Detection, SVM Classifications with HOG Features and Deep Learning Object Detection. The Above diagram illustrates the proposed block diagram we are implementing in the project. The Arduino IDE is the controller we are employing in the system. The Arduino IDE is a basic embedded system and being a low-cost single board computer used to reduce the complexity of systems in real time applications we have used the board. At First, In the project a pet call is provided using a recorded voice through a speaker to indicate feed time of the pet is initiated. The Ultrasonic Sensor is placed in order to detect the pet in front of the system. Once the pet detection is done using an ultrasonic sensor, the camera which is connected to PC is switched on and Camera captures image of the pet and processes. If the pet is recognized as required pet, a dc motor will be activated to dispense food. The dc motor is rotated to serve food and the rotation is controlled by H-Bridge. The diet of pet can be controlled by



dispensing a proper amount of food. This is done by controlling the rotation of dc motor. And then loadcell is used to detect the presence of food in the bowl. Also, when the food starts to decrease than the set point value, the load cell detects and a message will be sent as pet is fed. This System is implemented to feed one pet or more than one pet of either same species or different species using Image processing. The project implemented is for pets of different species. Hence, we have employed dc motors to dispense different kinds of food for different pets. So, food containers and food bowls are provided in this design. Once the required pet is fed successfully, the message will be sent to the owner's mobile number using a Twilio API and the message sent to telegram through node MCU. Pets Detection and recognition is done using Convolution Neural Network technique. For model training first we need create dataset. TensorFlow Object Detection API uses the TF Record file format, so at the end we need to convert our dataset to this file format. TensorFlow is a free open source software library for data flow. To prepare the input file for the API you need to consider two things.

- 1) Image must be in the form of jpeg or png.
- 2) we need a list of bounding boxes for image and class of the object in the bounding boxes.

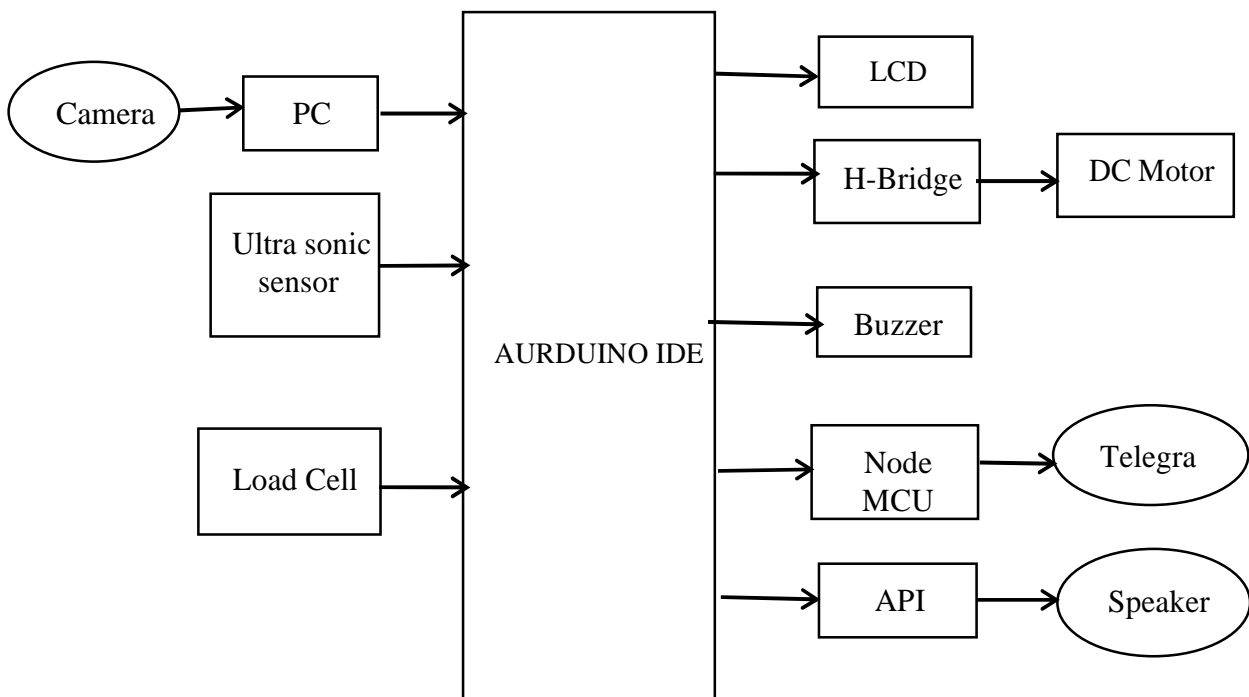


Figure 1: Block diagram of IOT Based Automatic Pet Feeder.

III.FLOWCHART

The flowchart begins with the initialization of the system, which includes setting up the camera, ultrasonic sensor, and load cell. The system then waits for the ultrasonic sensor to detect a pet. Once a pet is detected, the camera turns on to visually monitor the pet. Next, the system checks if the detected pet is required pet or sick pet. If the pet is identified as correct pet then machine start to dispense the respective pets food, If the pet is identified as sick, then food dispensed based on owner's settings and specific actions are taken before moving forward. After dispensing the food, a load check is performed to ensure there is enough food supply. Following this, the system sends a message to notify relevant parties about the food load status or any other important information. Finally, the process concludes with the system stopping, marking the end of the sequence. This flowchart outlines a pet monitoring and feeding system that uses sensors and cameras for detection, health evaluation, food dispensing, and notifications.

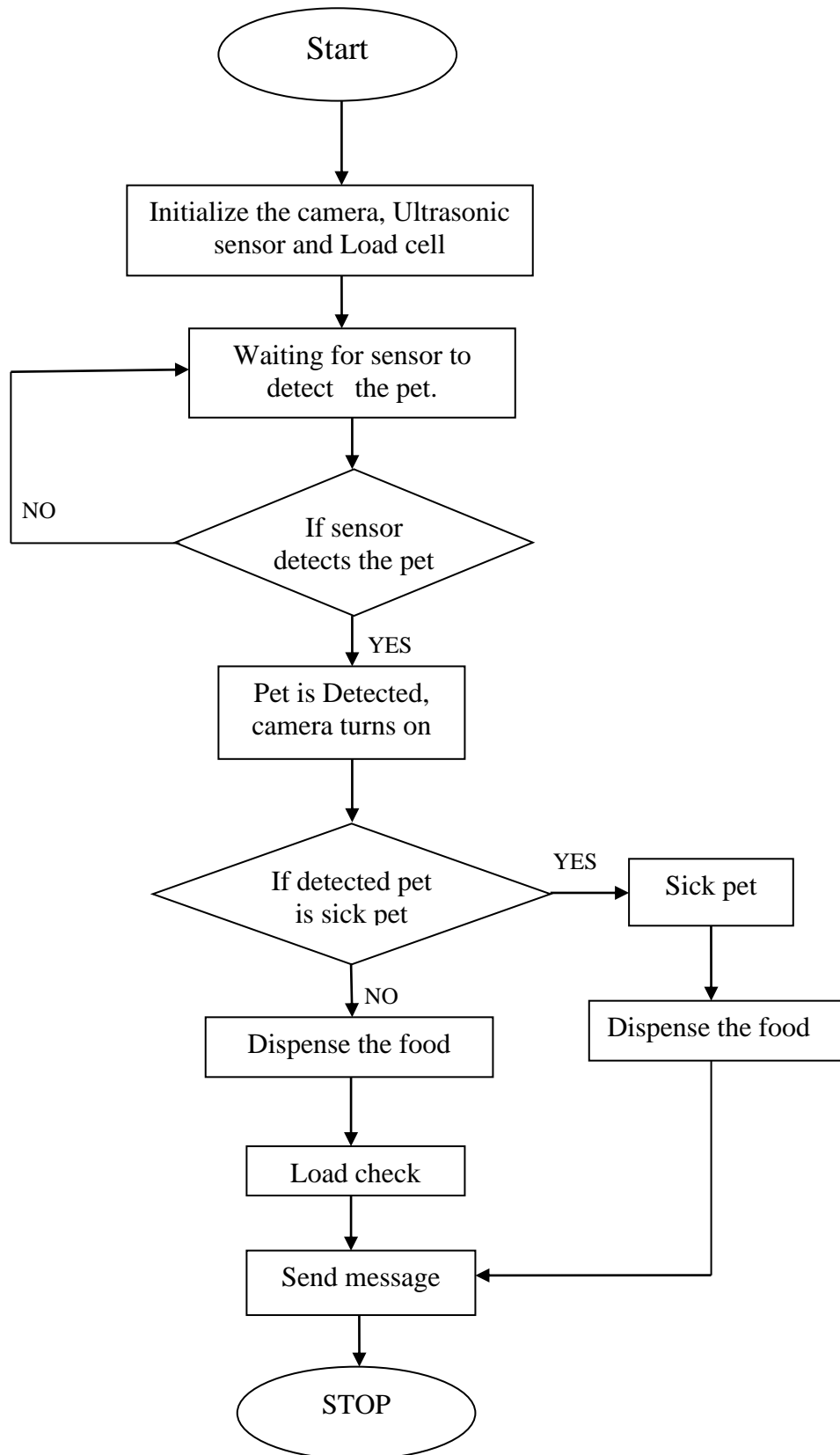


Figure 2: Flow chart of IOT Based Automatic Pet Feeder.



IV. RESULT ANALYSIS

The IoT-based automatic pet feeder project introduces a highly advanced and user-friendly system for pet care, addressing the challenges of busy or frequently traveling pet owners. This innovative feeder can be controlled via an interactive remote controller, allowing users to set feed times, intervals between feeds, and the quantity of food dispensed, eliminating the need for manual adjustments seen in previous versions. Key features include a voice call function that uses the owner's recorded voice to summon pets at feeding times, ensuring they come to eat. The feeder also provides refill alerts when the food container is running low, and it includes a dual power supply with a battery charger for uninterrupted operation. A safety lock on the food container prevents unauthorized access, and sensors ensure that any uneaten food is dispensed first, minimizing waste.

The system operates in two modes: Smart Mode and Control Mode. In Smart Mode, it calculates the right amount of food based on the pet's weight and dietary requirements, ensuring proper nutrition. Control Mode allows for both scheduled automatic feeding and manual feeding at any desired time, with adjustable dispensing durations. Real-time measurements from the load cell and ultrasonic sensor guarantee accurate food dispensing. Additionally, a messaging alert system notifies owners if their pet misses a meal, providing peace of mind. This design not only improves the convenience and flexibility of pet feeding but also enhances monitoring capabilities, ensuring pets are properly fed and cared for even when their owners are not at home. Future enhancements could include integrating a camera for video monitoring and multimedia messaging, further increasing the system's interactivity and functionality.

V. CONCLUSION

The IoT-based automatic pet feeder represents a significant advancement in pet care technology, offering unparalleled convenience, flexibility, and food monitoring capabilities for pet owners. By integrating an interactive remote controller, the feeder allows precise customization of feed times, intervals, and quantities. Key features such as refill alerts, dual power supply, and safety lock enhance the system's functionality and reliability. The weight-based feeding and Control Mode for both scheduled and manual feeding ensure that pets receive the appropriate amount of food at the right times. Real-time measurements and a messaging alert system provide accurate dispensing and timely notifications, ensuring pet owners are always informed about their pets' feeding status. This innovative design not only helps maintain pet's health by preventing overfeeding and food wastage but also provides peace of mind for owners, knowing their pets are well cared for even in their absence. Future enhancements, such as integrating a camera for video monitoring, will further elevate the system's capabilities, making it an indispensable tool for modern pet care.

REFERENCES

- [1] "Intelligent Food Dispenser (IFD)" Hari N. Khataavkar, Rahul S. Kini, Suyash K. Pandey, Vaibhav V. Gijare, 2019
- [2] "Digital Image Processing-A Quick Review" R. Ravikumar, Dr. V. Arulmozhi, 2019
- [3] "A Remote Pet Feeder Control System via MQTT Protocol" Wen-Chuan Wu, Ke-Chung Cheng, PeiYu Lin, 2018
- [4] "Automatic Pet feeder" AasavariKank, Anjali Jakhariye, 2018
- [5] "Pet Feeding Dispenser using Arduino and GSM Technology" Smruthi Kumar, 2018
- [6] "Automatic Pet Monitoring and Feeding System Using IoT" S.Subaashri, M.Sowndarya, D.K.S. Sowmiyalaxmi, S.V.Sivassan, C. Rajasekaran, 2017
- [7] "Remote Controlled and GSM Based Automated Pet Feeder" Prashant Singh, Amit Kumar Sharma, PayalSood, Paramdeep Singh, 2015
- [8] "Automatic Pet Feeder" Manoj M, 2015
- [9] "Smart Dog Feeder Design Using Wireless Communication, MQTT and Android Client" Vania, KanisiusKaryono, Hargyo Tri Nugroho I, 2016
- [10] "Programmable Pet Feeder" TessemaGelilaBerhan, WorkuToyibaAhemed, TessemaZelalemBirhan, 2014
- [11] R Sindhoori, "Digital image processing. Multi feature face recognition in PSO -SVM" SSRG International Journal of Electrical and Electronics Engineering 1.3 (2014): 1-6.