

PROJECT PROPOSAL

SMART PET CARE HOUSE



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Introduction

As pet ownership increases and people lead busier lives, the need for smart pet care systems is growing. This project introduces a Smart Pet Care House that automates feeding, water monitoring, and food quality checks using sensors. It uses a weight sensor to determine pet weight and dispense the correct amount of food, an ultrasonic sensor to monitor water levels, and a gas sensor to detect spoiled food. This system reduces manual effort and improves pet safety and health by ensuring timely feeding, hydration, and food quality—all managed efficiently through sensor-based automation.

Background and context

In traditional pet maintenance, owners themselves need to ensure pets receive regular feeding at correct times, fresh water supply, and avoid coming into contact with spoiled food. With more stressful lifestyles nowadays, though, pet owners often find it hard to maintain standard feeding schedules and sanitary practices. Irregular feeding time, inadequate amount of food, dry water dishes, or inattention to spoiled food can all lead to ailments in pets. This highlights the need for a more secure and automated system that is able to efficiently handle routine pet care activities.

Sensor and microcontroller platform technologies such as Arduino have enabled routine pet care tasks to be automated. With the inclusion of simple, low-cost sensors, we can implement a system that has smartly supplied feedback to altering conditions in real-time, such as adjusting the quantity of food according to the pet's weight, refilling water when the water level is low, and sensing spoiled food by monitoring harmful gases such as ammonia.

This project applies these technologies to create a Smart Pet Care House. This system not only stealing time from pet owners but also making pets' lives healthier and more comfortable. It is particularly useful for working people or families in which pets spend hours alone.

Objectives

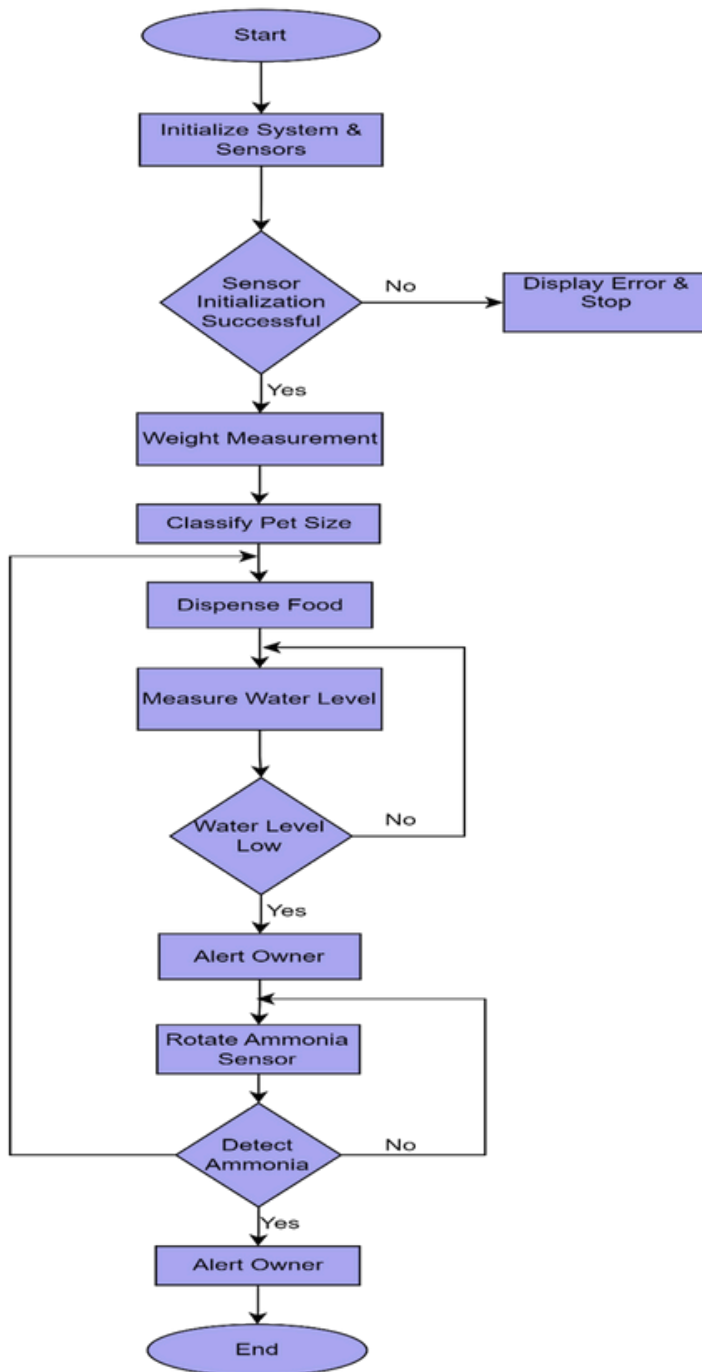
- The project aims to detect a pet's weight and automatically dispense the correct amount of food
- To monitor the water level in the water tank and refill it.
- To detect spoiled using ammonia gas sensors and alert the user.
- To ensure consistent feeding, hydration and food safety for pets.
- To minimize manual effort required in daily pet care routines.

Project Scope

This project focuses on designing and implementing a Smart Pet Care House using sensors. It consists of three sensors: one to measure the weight of the animals, another to measure the water level inside the water tank, and a gas sensor for detecting ammonia from spoiled food. Out of these three sensors we plan on creating our own weight sensor from scratch.

After preparing the sensor typically we adjust weight range into three ranges according to the weight range of animals, we control amount of food which has to be fed using server motor. In addition we use another server motor to detect the spoiled food. Ammonia sensor attached shaft rotates in angle 30 by 30 degrees. It waits at each position for some period of time until the spoiled food is detected. If spoiled food is detected light will be turn on and shafts stops until we go there and remove it. Then shaft comes to the zero position and move again.

Methodology



1. System Design:

In the first phase, the project begins with the system's design. Here, the circuit diagram and layout are designed and the right sensors and components that are needed for the system are selected. The sensors that have been chosen include a weight sensor for weight measurement, an ultrasonic sensor for water level detection, and an ammonia sensor for detecting spoiled food. The Arduino platform will serve as the master controller to handle the sensor inputs and drive actuators.

2. Weight-Based Food Dispensing:

At this step, a weight sensor is placed on a platform where the pet is made to stand. It measures the pet's weight, and based on this value, the system classifies the pet's size into sizes (e.g., small, medium, large). The corresponding amount of food is delivered through a servo motor. This gives the pet the proper amount of food based on its weight.

3. Water Level Monitoring and Refill:

During this phase, an ultrasonic sensor is employed to measure the water level in the pet's bowl. The sensor continuously calculates the distance to the water surface. When the water level drops below a predetermined threshold, the system identifies it and provides warning to the owner.

4. Spoiled Food Detection:

At this phase, a gas sensor is used to detect the presence of ammonia gas, which comes from spoiled food. The gas sensor is mounted on a rotating servo motor so that it can sweep through different food containers. If spoiled food is detected, the system will alert the owner with a LED light, signifying attention and action.

5. Testing and Calibration:

This final phase consists of severe testing and calibration of actuators and sensors. Every sensor reading is cross-checked within a controlled environment. Thresholds are set to make the system stable, and once all components are assembled, the entire system is tested to ensure that it performs as it was designed to perform in actual circumstances.

Cost Estimation

Components	Rs.
Mq - 137 Sensor	4058.00
Arduino boards	2900.00
Ultrasonic Sensor	330.00
Bread boards, wires	2000.00
Servo motors 4	2000.00
Total	11288.00

Market Review

Unlike the vast majority of smart pet feeders currently available for purchase, this system stands out in its ability to tailor food portions to suit the weight of the pet for healthier feeding behavior. The in-built water level monitoring also helps pets never be without water, while the feature of ammonia gas detection sends the owner a warning that food has spoiled , an uncommon and highly valuable safety element lacking in nearly all other options. All of these smart features make the system an integrated and intelligent solution for modern pet care.

Timeline

Month	Week	Task
March	Week 3	Project Planning
	Week 4	
April	Week 1	Gather Requirements
	Week 2	Designing Project
	Week 3	
	Week 4	Implementation
May	Week 1	
	Week 2	
	Week 3	Initial Testing & Feedback
	Week 4	Fine Tuning
June	Week 3	Final Testing
	Week 4	Deployment

Conclusion

The Smart Pet Care House project offers a creative and practical solution to common pet care problems. With the use of inexpensive, simple sensors and automation, the system keeps pets well-fed, hydrated, and safe from eating hazards without round-the-clock human intervention. The weight-based food dispensing, water level monitoring, and detection of spoiled food features highly improve the ease of use and bliss of pets and pet owners. This project not only makes it easier to do regular pet care but also ensures the health and safety of pets by the assurance of regular feeding and provision of clean water. In addition, it can be scaled up for veterinary clinics or pet shelters, opening up more opportunities for mass application.

References

- [1] S.Subaashri, M.Sowndarya, D.K.S. Sowmiyalaxmi, S.V.Sivassan and C.Rajasekaran, "Automatic Pet Monitoring and Feeding System UsingIoT", International Journal of ChemTech Research, vol. 10, no. 14, pp.253-258, 2017
- [2] G. Parker, "Top 10 Automatic Pet Feeders of 2019", Wiki.ezvid.com,2018. [Online]. Available: <https://wiki.ezvid.com/best-automatic-pet-feeders>. [Accessed: Sep. 09, 2019]

