**PET MONITORING SYSTEM**

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***Abstract* — *This project introduces a Smart Pet Care System that utilizes advanced sensor technologies for efficient pet monitoring and well-being. The system employs a Passive Infrared (PIR) motion sensor to detect the presence and motion of the pet, ensuring real-time awareness of its location within the monitored area.To enhance the pet's comfort, the system incorporates an ultrasonic sensor to monitor the water level in a beaker. If the pet is detected, the water level is automatically checked, and if it falls below a predefined threshold, a solenoid valve is activated to refill the beaker, ensuring a continuous and adequate water supply. The integration of these sensors ensures a proactive approach to pet care, allowing pet owners to remotely monitor their pet's presence and hydration status. This project combines sensor technology and automation to create a reliable and responsive system for pet owners seeking to enhance the well-being of their beloved companions***.

***Keywords*** *— (Aruduino-uno,PIR motion sensor,Ultrasonic sensor)*

# INTRODUCTION

Pet ownership brings joy and companionship to countless individuals around the world. However, responsible pet care demands time and attention to their basic needs, such as ensuring they have access to water. In this context, we present an innovative solution – an Automated Pet Care System designed to monitor the presence of pets and ensure their hydration needs are met. The system integrates advanced technologies, including Passive Infrared (PIR) motion sensors and ultrasonic sensors, to create a comprehensive pet monitoring and hydratio mechanism. The PIR motion sensors act as a presence detector, allowing pet owners to track their pet's movements and know if they are in the designated area. Beyond monitoring, the system incorporates ultrasonic sensors to assess the water level in a dedicated beaker. If the water level is low, indicating a potential need for replenishment, a solenoid valve is activated to fill the beaker automatically. This not only ensures the pet has a constant supply of water but also minimizes the owner's intervention, providing convenience and peace of mind. By combining these technologies, our Automated Pet Care System aims to enhance the well-being of pets while simplifying the responsibilities of pet owners. This project paper will delve into the technical aspects, design considerations, and the implementation of the system, showcasing its potential to revolutionize pet care in a smart and efficient manner.

# LITERATURE SURVEY

The literature survey on pet monitoring systems employing a specific set of technologies, namely Arduino Uno, PIR (Passive Infrared) motion sensor, and Ultrasonic sensor, reveals a niche focus on developing cost-effective and accessible solutions for pet owners. Researchers have explored the integration of these sensors with Arduino Uno microcontrollers to create a versatile platform for pet monitoring. PIR motion sensors, sensitive to infrared radiation emitted by living beings, enable the detection of a pet's presence and movement within a defined area. Ultrasonic sensors, on the other hand, offer distance measurement capabilities, allowing for proximity sensing and tracking the pet's location.

Studies highlight the practical implementation of Arduino-based pet monitoring systems, emphasizing real-time data acquisition and processing. The use of these sensors, coupled with the Arduino platform, provides an efficient means to monitor a pet's activity levels and location within a designated space. Researchers have demonstrated the potential for health monitoring by integrating additional sensors to measure parameters such as temperature and humidity.

Furthermore, literature in this domain discusses the challenges and limitations associated with using Arduino Uno, PIR motion sensors, and Ultrasonic sensors, including power consumption, accuracy, and range constraints. Researchers have proposed optimization techniques and customization approaches to address these challenges, contributing to the ongoing development of reliable and user-friendly pet monitoring systems. As this field progresses, there is a notable emphasis on open-source collaboration and the sharing of Arduino-based pet monitoring designs, fostering a community-driven approach to innovation and affordability in the realm of IoT-enabled pet care.

# METHODOLOGY

The methodology for implementing a pet monitoring system using Arduino Uno, PIR motion sensor, and Ultrasonic sensor involves several key steps:

1**. System Design:**

Define the objectives of the pet monitoring system, specifying the parameters to be monitored (e.g., motion, distance). Determine the placement of sensors for optimal coverage and accuracy.Establish the communication protocol between Arduino Uno and the sensors.

**2. Hardware Setup**:

1. **PIR Motion Sensors:**

Utilize PIR motion sensors strategically placed within the designated pet area for accurate presence detection.Integrate microcontrollers to process sensor data and trigger relevant actions based on pet movement.

1. **Ultrasonic Sensors**

Implement ultrasonic sensors to measure the water level in the dedicated beaker.Interface the sensors with

microcontrollers to interpret water level data for decision- making.

1. **Solenoid Valve**

Employ a solenoid valve as the water dispensing mechanism.Connect the solenoid valve to the microcontroller to enable automatic water refilling when triggered by low water level signals from the ultrasonic sensors.

1. **Microcontrollers**

Select suitable microcontrollers (e.g., Arduino, Raspberry Pi) to process data from both PIR motion and ultrasonic sensors. Program the microcontrollers to execute specific tasks such as activating the solenoid valve based on sensor inputs.

1. **Power Supply**

Design a reliable power supply system to ensure continuous operation.Consider energy-efficient options and incorporate a backup power source for uninterrupted functionality.

1. **Communication Module (Optional)**

Integrate a communication module (Wi-Fi, Bluetooth) for remote monitoring and control.Enable pet owners to receive alerts or check the status of the Automated Pet Care System via a mobile application.

1. **Enclosure**

Develop a protective enclosure to shield the electronic components from environmental factors and potential pet

**3.Software Design**

1. Arduino Code

The Arduino code for the IoT Pet Monitoring System involves the initialization of PIR sensor pins to interface with the Arduino board. The code continuously monitors the PIR sensor for any detected movement, specifically focuse

on capturing pet activity. Upon detecting movement, the code triggers an event to signify the occurrence of pet movement. This fundamental functionality serves as the basis for the overall system, allowing the Arduino to effectively sense and respond to the presence of the monitored pet through the PIR sensor

1. Node.js Server

The IoT Pet Monitoring System is designed with a Node.js server using Express.js for efficient routing. It employs Socket.IO for real-time communication, allowing the server to notify the web client instantly about pet movement and water status changes. The system integrates with ThingSpeak through its API, facilitating the retrieval and display of historical data. This integration ensures that the server stays updated regularly with ThingSpeak data, enhancing the system's capability to provide comprehensive insights into the pet's activities and environmental conditions. Together, these components contribute to a robust and responsive solution for monitoring pets in real-time and accessing historical data for a more thorough analysis of their well-being.

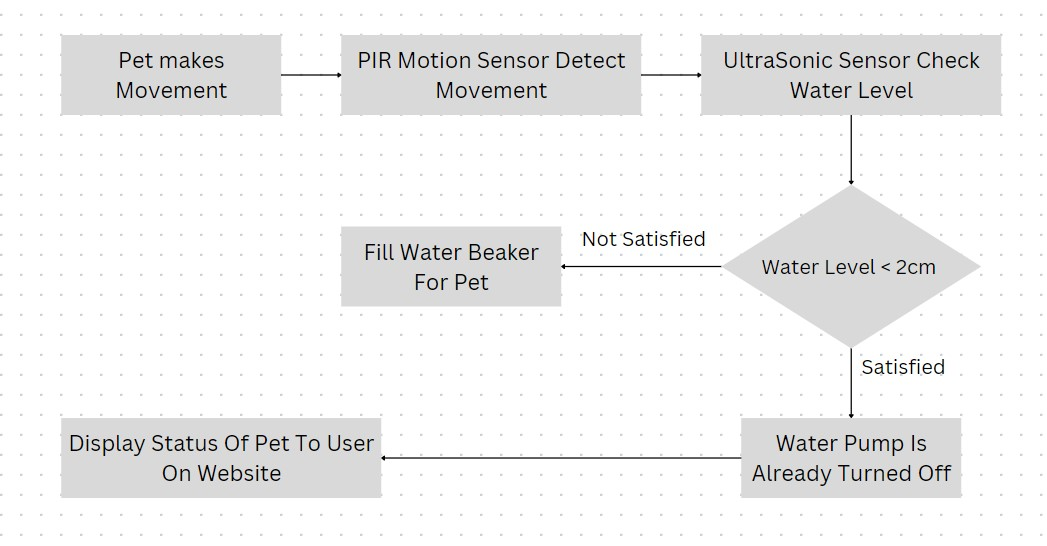
1. Web Interface

The IoT Pet Monitoring System's software design encompasses a user-friendly web interface built using HTML, CSS, and JavaScript to ensure simplicity and responsiveness. JavaScript is employed to facilitate real-time updates on the interface, enhancing user experience. The integration of Socket.IO establishes a connection to the server, enabling dynamic UI

1. ThingSpeak Integration

The software design for the IoT Pet Monitoring System revolves around several key components. Firstly, the implementation of ThingSpeak integration involves setting up channels for pet movement and water level, configuring field updates, and ensuring effective data logging. This necessitates the secure management of ThingSpeak API keys for authentication, coupled with robust error handling mechanisms for API interactions. Additionally, the Integration Testing phase focuses on validating data transmission between Arduino and Node.js, verifying that updates in pet movement on capturing pet activity. Upon detecting movement, the code triggers an event to signify the occurrence of pet movement. This fundamental functionality serves as the basis for the overall system, allowing the Arduino to effectively sense and respond to the presence of the monitored pet through the PIR senso

## Architecture Diagram



# RESULTS

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# FUTURE SCOPE

As we look ahead, there are several avenues for future exploration and improvement in our Automated Pet Care System. Enhancements could involve refining the algorithm for pet presence detection, incorporating machine learning to better understand pet behavior, and exploring additional sensors to provide a more comprehensive monitoring experience.Additionally, the system could be expanded to include features such as automated pet feeding or environmental monitoring to ensure optimal conditions for the pet. Collaborations with veterinary experts could provide insights into tailoring the system to specific pet breeds or health conditions, further customizing the pet care experience.In conclusion, our project lays the foundation for a smarter and more interconnected approach to pet care, and we anticipate that future developments will continue to push the boundaries of what is possible in ensuring the well-being of our beloved animal companions.

# CONCLUSION

In conclusion, our Automated Pet Care System represents a significant advancement in the field of smart pet care. By combining PIR motion sensors for accurate presence detection and ultrasonic sensors for water level assessment, we have addressed the limitations of existing systems and created a more efficient and responsive solution. This not only enhances the well-being of pets by ensuring timely access to water but also provides convenience for pet owners in managing their busy schedules.The integration of Internet of Things (IoT) technologies further positions our project at the forefront of innovation in the pet care domain. This system not only meets the immediate needs of pets but also aligns with the broader trend of interconnected and intelligent devices that enhance our daily lives.

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