IOT BASED PET CARE ROBOT

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Introduction

- Pets are now an essential member of the family because they make life more enjoyable and alleviate the stress of work and life. As a result, pet owners are becoming increasingly concerned about companion animals.
- Pet’s cannot be feed on time ,when they are alone at home. The pet owner cannot comprehend the pet current situation if it is alone at home.
- Pet care is a must to ensure their mental and physical well-being. There are currently no pet products on the market that can satisfy users' requirements because they only serve one purpose and have a straightforward design. Due to the particular requirements, a similar service robot is necessary for home living.

Abstract

- The IoT-based pet care robot that is designed to provide convenient and intelligent care for pets. The robot is equipped with a pan-tilt camera, which can be remotely controlled to monitor pets' movements and activities in real-time.
- The robot also includes a food and water dispenser that can be triggered manually. Additionally, the robot has the ability to move and navigate around the home to follow pets as they move about and a webpage and app are designed for the pet owners to control the camera, movement, food and water dispenser of the robot.

Literature Survey

S.NO	TITLE	AUTHOR	YEAR OF PUBLICATION	INFERNCE
1	**IOT BASED PET DAY-CARE ROBOT**	Minal Ghute; Shreyas Deshpande; Abhishek Sondavle; Swaraj Bhalerao; Mayur Deshmukh	3/12/2022	This robot uses the Internet of Things. It indicates that the owner will be able to easily and effectively care for their pet by controlling the robot with their smartphone. This robot can operate on an Internet of Things (IoT) and cloud platform. Both of these principles allow the robot to communicate with a mobile phone, allowing it to be controlled from anywhere in the world via Wi-Fi. The Raspberry Pi 4 and Arduino Uno, which are interfaced with one another, were used in the design of this robot.
2	**DESIGN OF HOME SERVICE ROBOT FOR PET CARING**	Weilun Deng, Yongtao Shi, Chuanqing Li, Tian Zou and Chunlai Tian	12/04/2011	According with the user's service requirements, The caring pet robot is mainly composed of feeding system, serve system, grasp system, driving system and real-time monitoring system. The robot applies a support platform to connect the various modules and provide overall body support. The serve system uses a two-layer frame-shaped cuboid and the feeding system is behind the serve system. The real-time monitoring system is composed of an external camera at the top of the fuselage and a sensor control circuit embedded in each system

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3	**IOT BASED DOG DAY-CARE ROBOT**	Sunil K., Vishwanath S, Vikas .T, Avinash. K, Jagadish J	07/07/2022	Using a microcontroller and a Node MCU, an automatic pet feeder will feed the pets whenever the owner wishes. The user can feed their pet by pressing a button from any location in the Blynk mobile application that is connected to the internet. This method is extremely simple to use. A Node MCU with motor driver to regulate the motor, a dc motor to mechanize the dispensing action, and a container that serves as the food's storage unit make up the Dispensing .
4	**IOT BASED SMART PET CARE SYSTEM**	Suvitha P , Niniya VB , Sanjay Kumar B , Shinassha VS , TR Devika	12/12/2022	The robot, which is based on IoT, can care for your pets on its own at home. For efficient use, the proposed system integrated with the internet. This study aims to combine multiple smart devices using a variety of technologies to make it easier for pet owners to use a single smartphone application to control the pet care robot and monitor their pet's behavior. More specifically, the collected data document the daily feeding, drinking, and urination habits of the pet, so any deviations may indicate an illness.

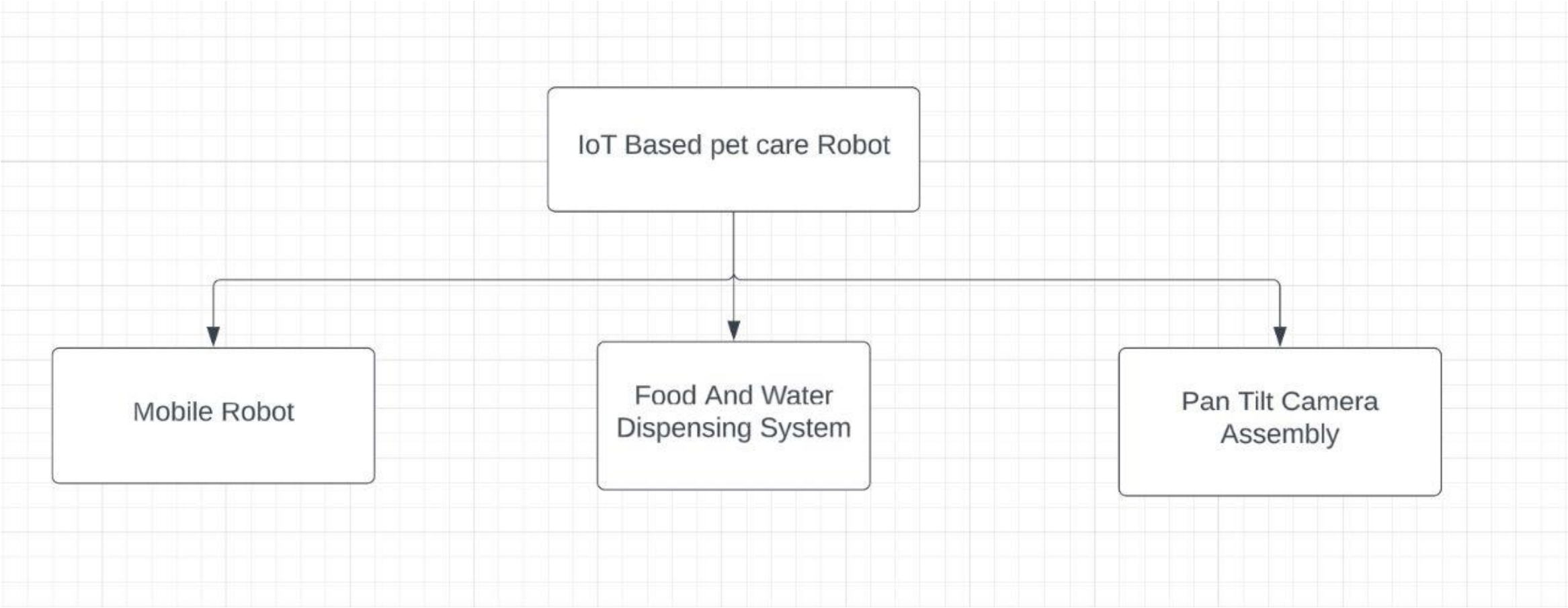
S.NO	TITLE	AUTHOR	YEAR OF PUBLICATION	INFERNCE
5	**A PROTOTYPE OF AN IOT-BASED PET ROBOT WITH CUSTOMIZABLE FUNCTIONS (COFIBOT V2)**	Christoforus W. D. Lumoindong and Erwin Sitompul	9/10/21	It has been demonstrated that owning a pet is good for your mental and physical health. Because they perceive their pets as entertaining, pet owners enjoy interacting with them to relieve stress. CoFiBot V2 is equipped with fire detection capability and customizable home monitoring functions. Simultaneously, it can roam freely within the owner's premises and provides the information on the surroundings via the internet to the owner. As an IoT-based mammal-type robotic pet, CoFiBot V2 is proven to be visually engaging and performs well under functionality and endurance tests.
6	**PET MONITORING ROBOT USING IOT**	Gottamukula Shivani	29/05/2022	The Robot is an IOT Based robot that is capable of taking care you your pets alone at home. The robot is integrated with a camera that allows for live streaming over IOT platform (BLYNK APP) to get on demand footage of home. The robot is a 3 wheeled drive system with a feeding tray and 2 x steel bins Bin1 Stores Dog Food/Cat Food Bin 2 Stores Water. The robot dispenses appropriate amount of food and water in feeding tray as instructed by user online and then slides open the feeding tray. Once the pet has eaten it closes the feeding tray. All of this can be monitored online by the pet owner. This entire system is controlled by a ESP32 controller that allows for efficient controlling of all robot functionalities.

S.NO	TITLE	AUTHOR	YEAR OF PUBLICATION	INFERNCE
7	**AUTOMATIC PET MONITORING AND FEEDING SYSTEM USING IOT**	S.Subaashri, M.Sowndarya , D.K.S. Sowmiyalaxmi , S.V.Sivassan, C. Rajasekaran	10/12/2017	This Pet care System is a complete equipment for monitoring all the pet activities and also by making the pet feel free. Furthermore, the project is subdivided into several modules each of which has the IR unique feature. They are pet monitoring door, pet food feeder and pet collar system. IR sensor consist an IR LED and photodiode, in which IR LED emits IR radiation and photodiode detects the radiation. The pet collar system which is provided with a GPS tag for continuously transmitting and identifying the whereabouts of a pet
8	**AUTOMATIC PET FEEDER USING INTERNET OF THINGS**	Jayaram Kumar Kondapalli, Venkata Ramana Sanepu	09/04/2019	One of the recent innovations in pet food preparation is the automatic pet feeder. It will be easier for pet owners to care for their animals when they are away. Even if the owners are not present, their pet can still be fed. Programmed pet feeder is worked to assist with petting proprietor dealing with their pet. One of the pet feeders that will be controlled by an internet-connected mobile application is an IoT pet feeder. The bowls will be filled with a predetermined amount of food and water by the automatic pet feeder. Users should be aware that pets also require proper diet management because they are pet lovers.

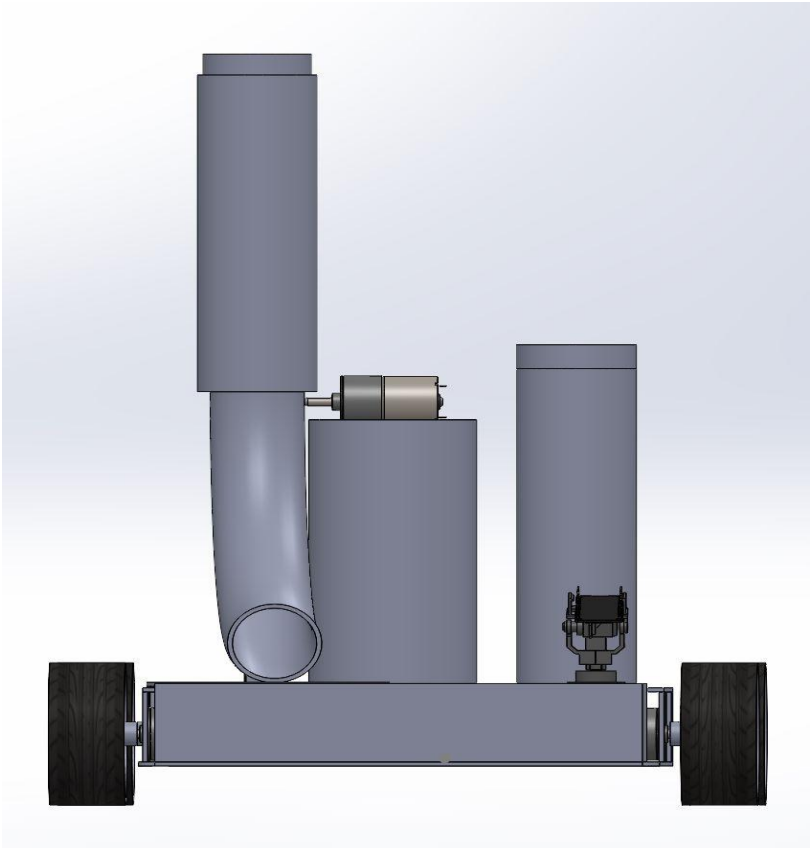
Problem statement

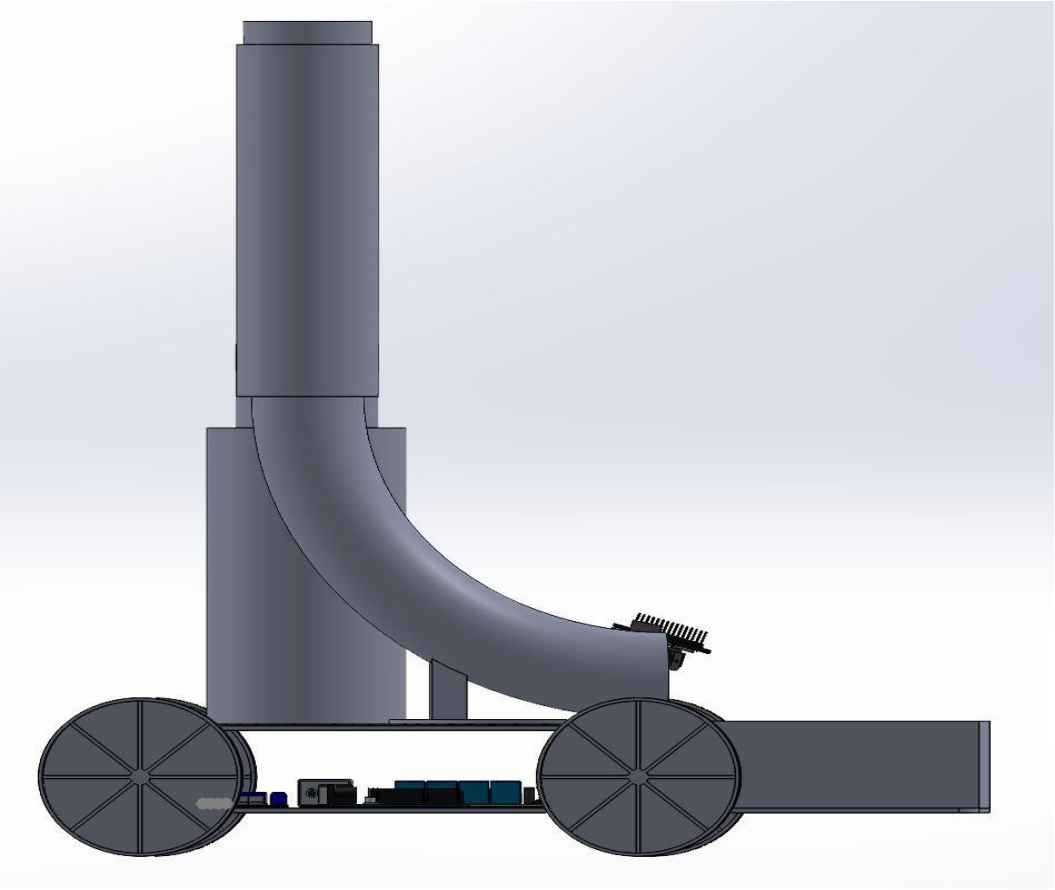
- When the owners of the pet are not able to take care of the pet due to the busy schedule but they want to take care of their pet , they can take the help of a pet care robot.
- A pet care robot is needed that can automatically provide basic needs to a pet, such as feeding and watering. The robot should also be able to interact with the pet to keep it amused and exercised.

Methodology

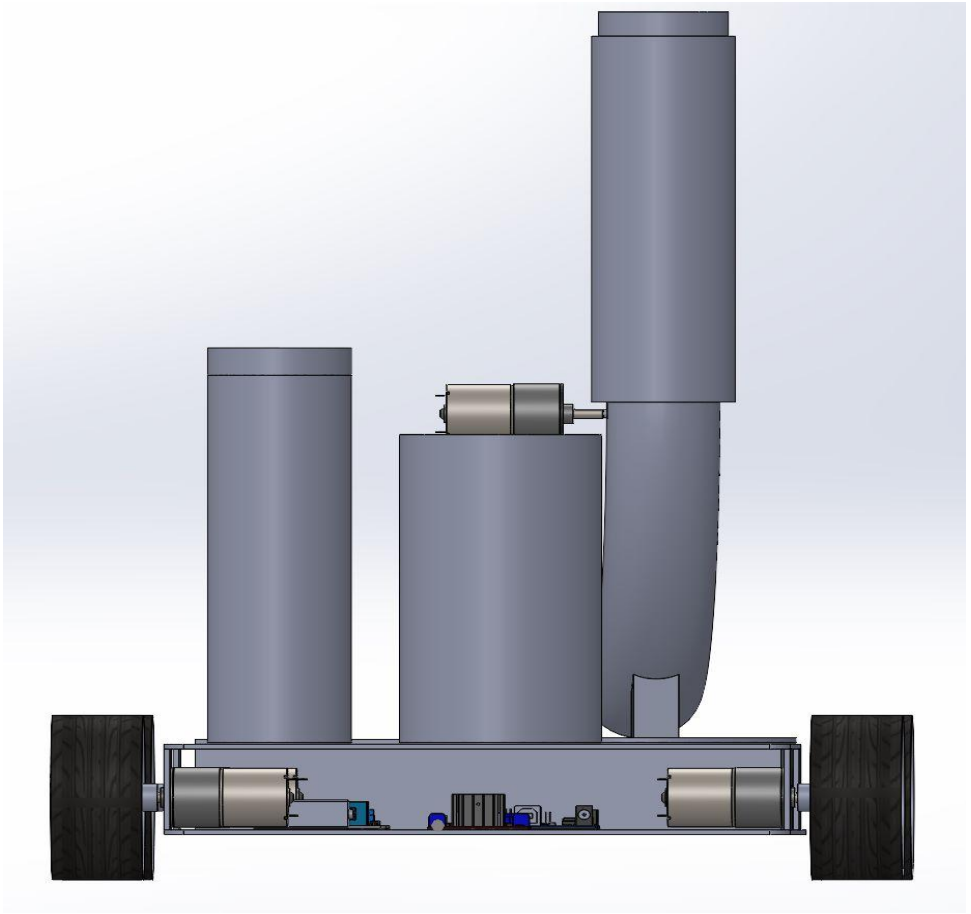


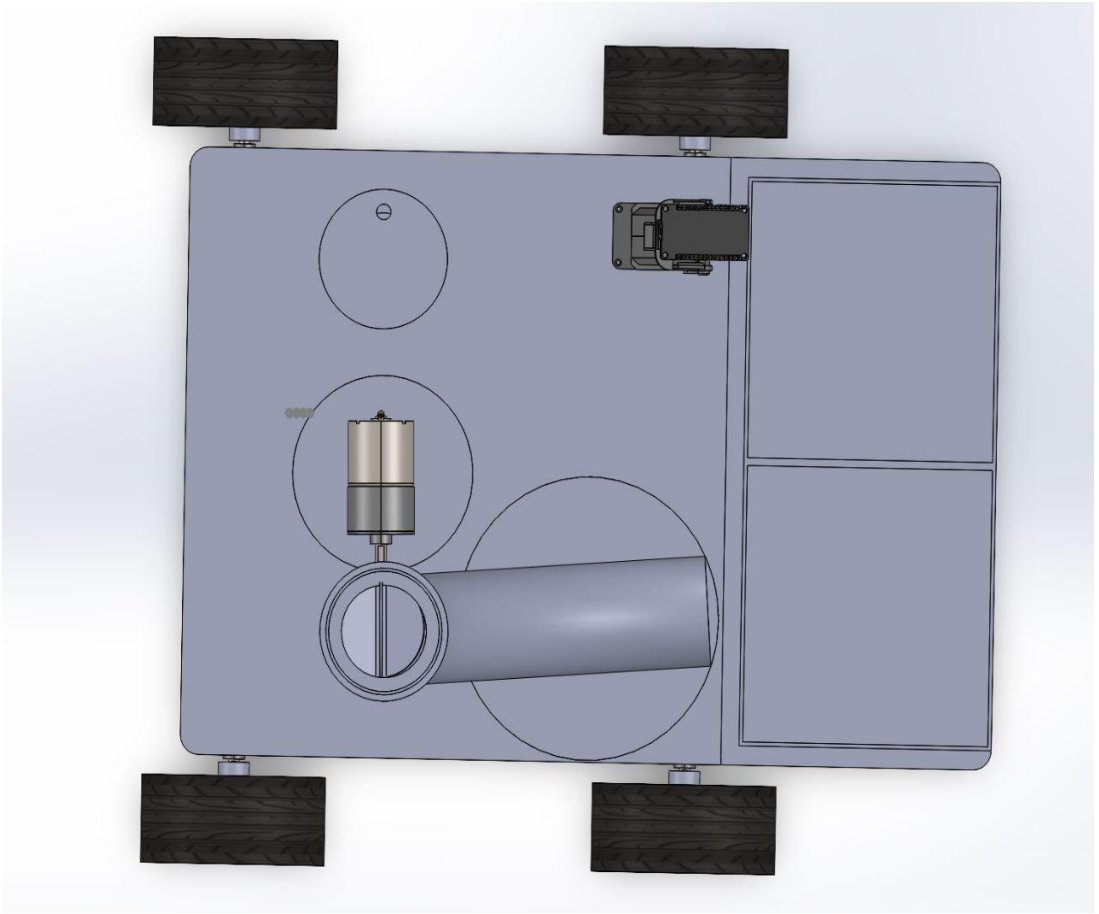
Design of the Robot



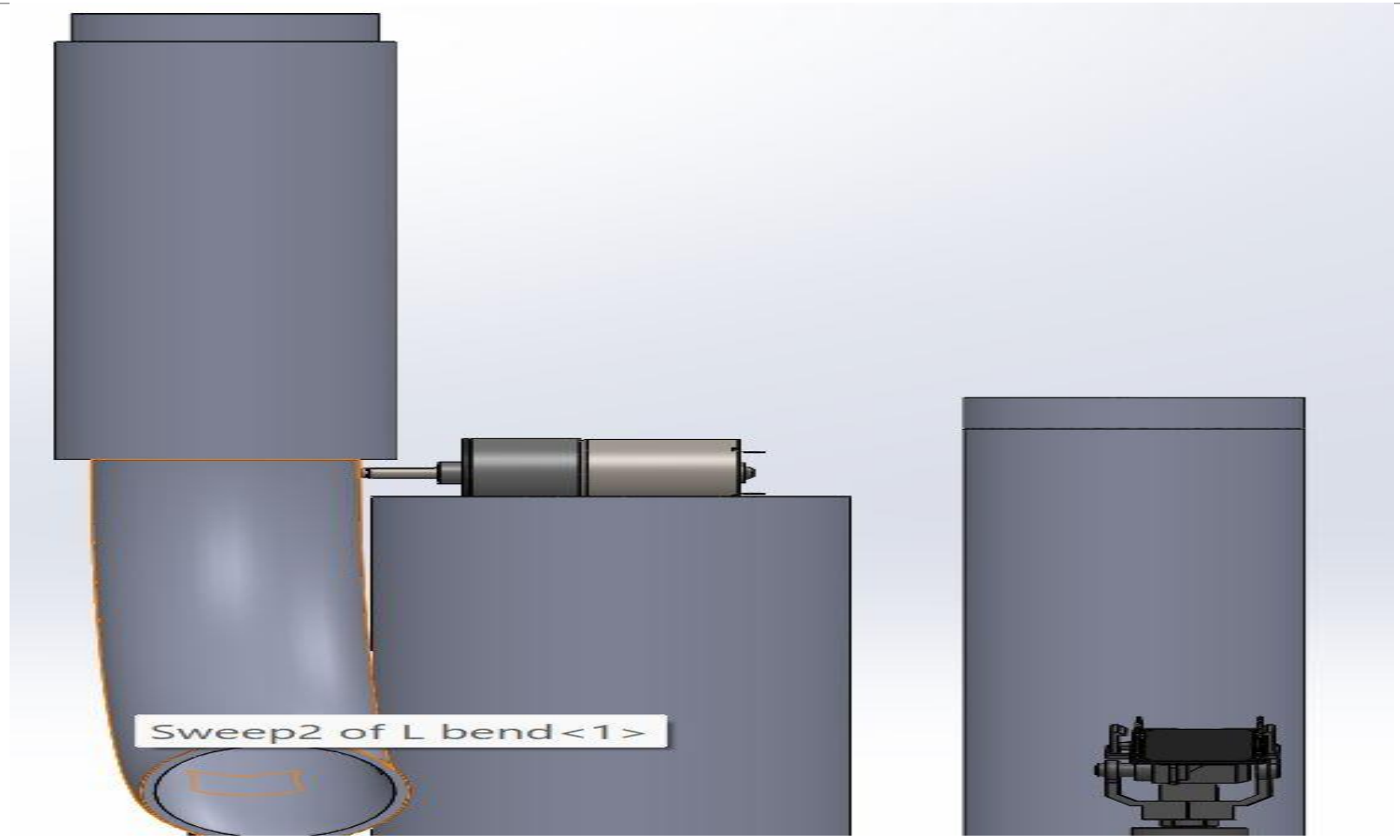


Design of the Robot

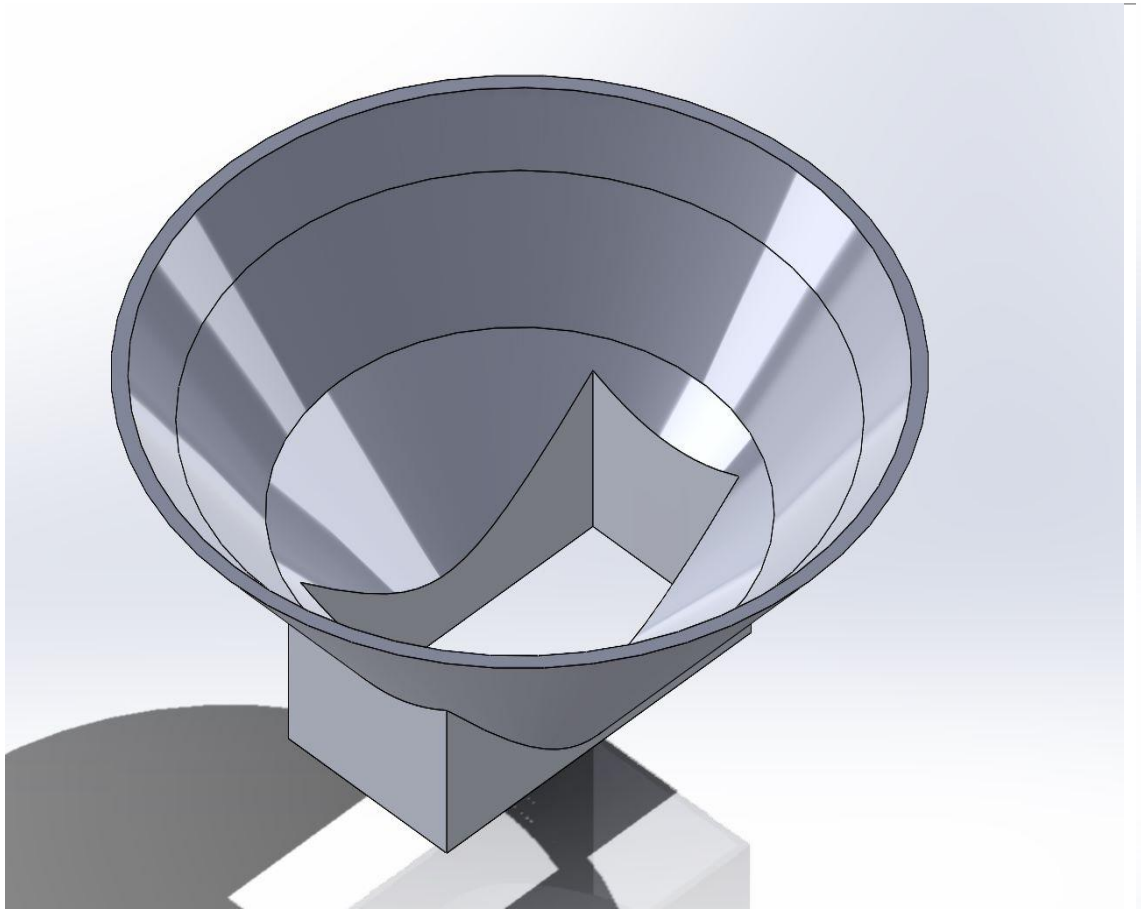


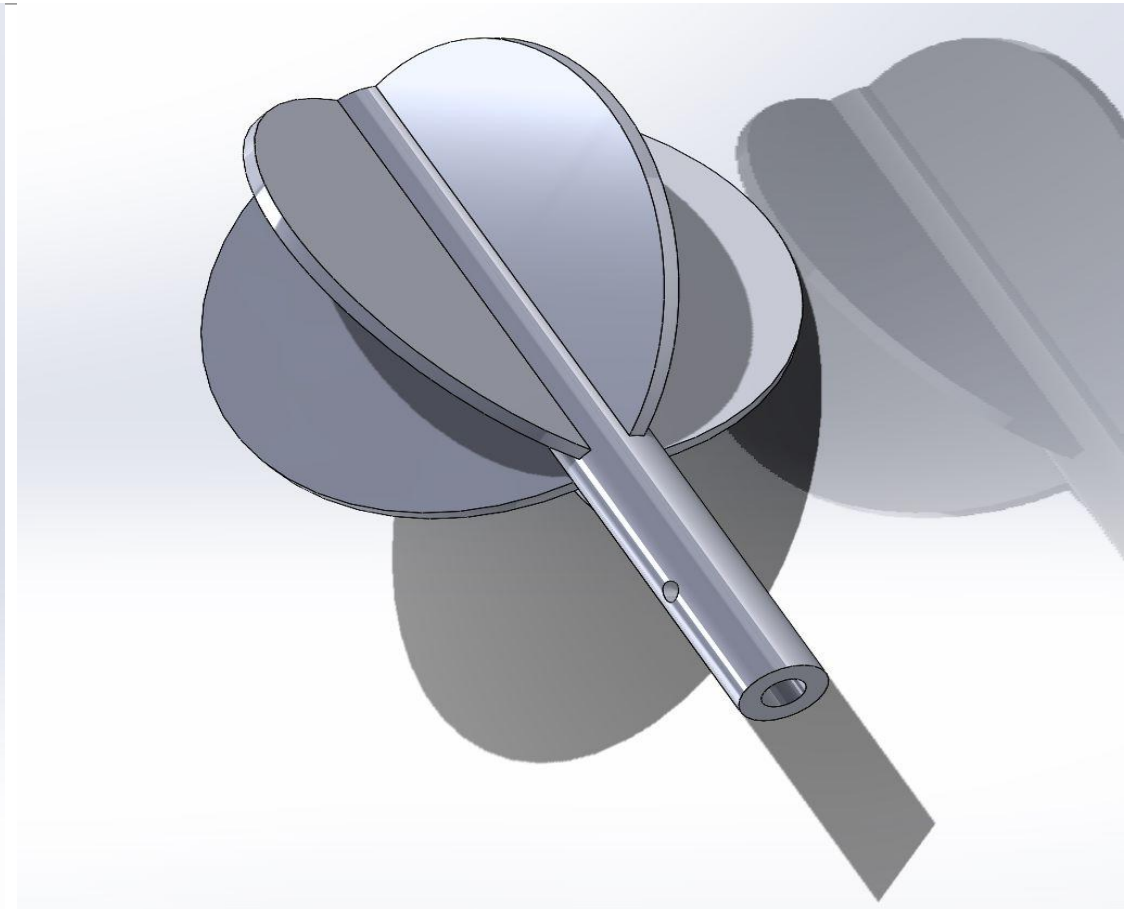


Design of the dispenser system

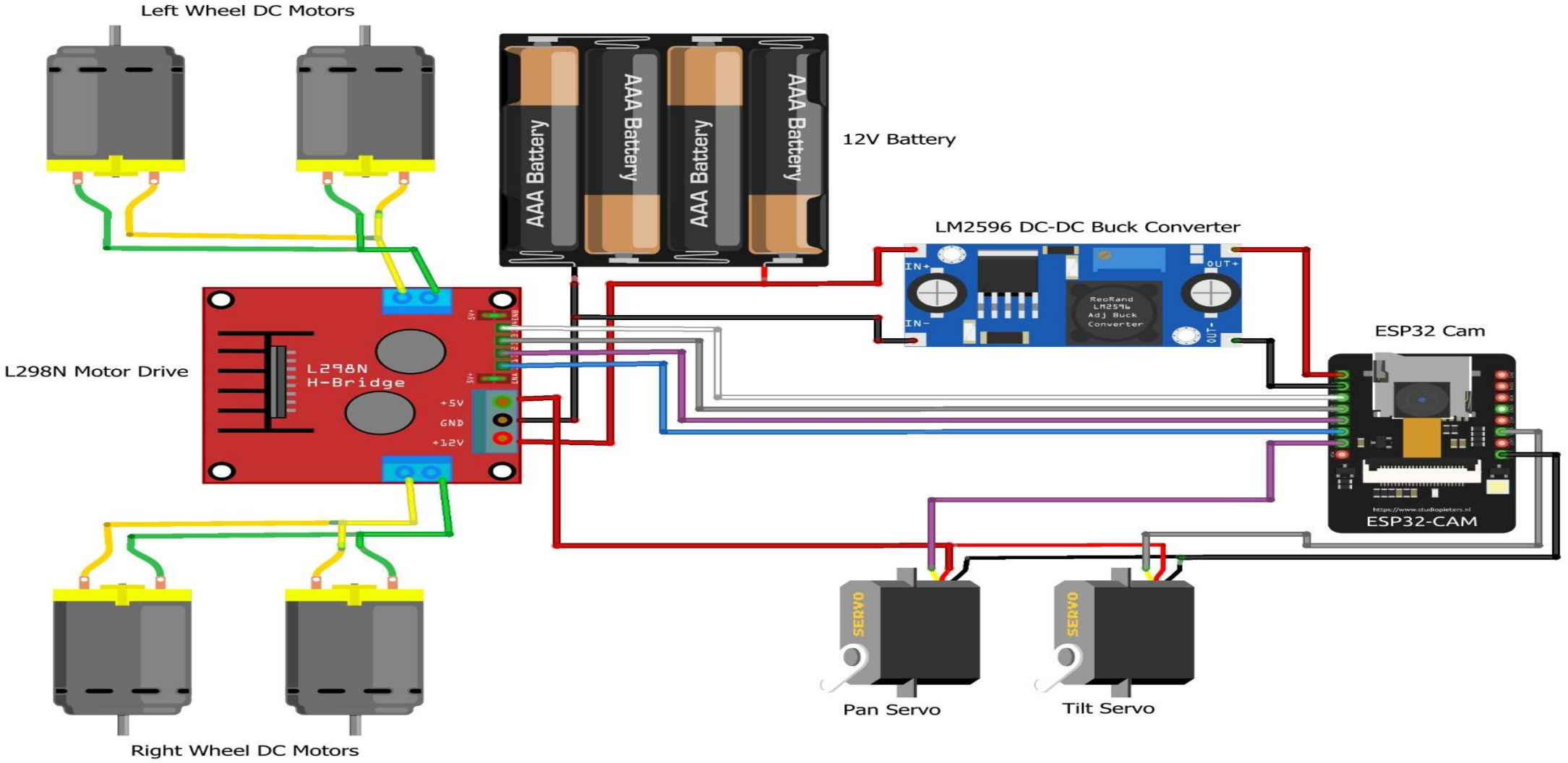


Design of the dispenser system

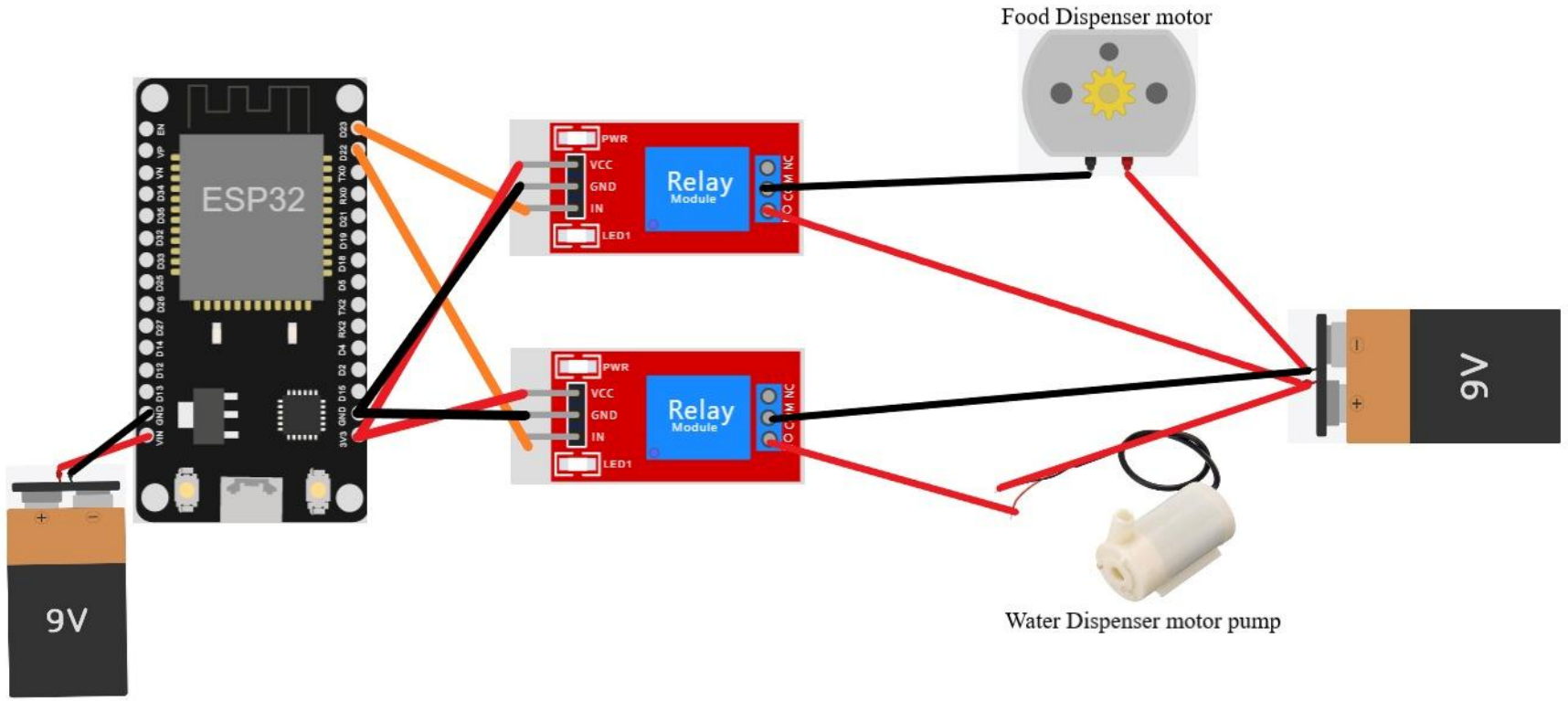




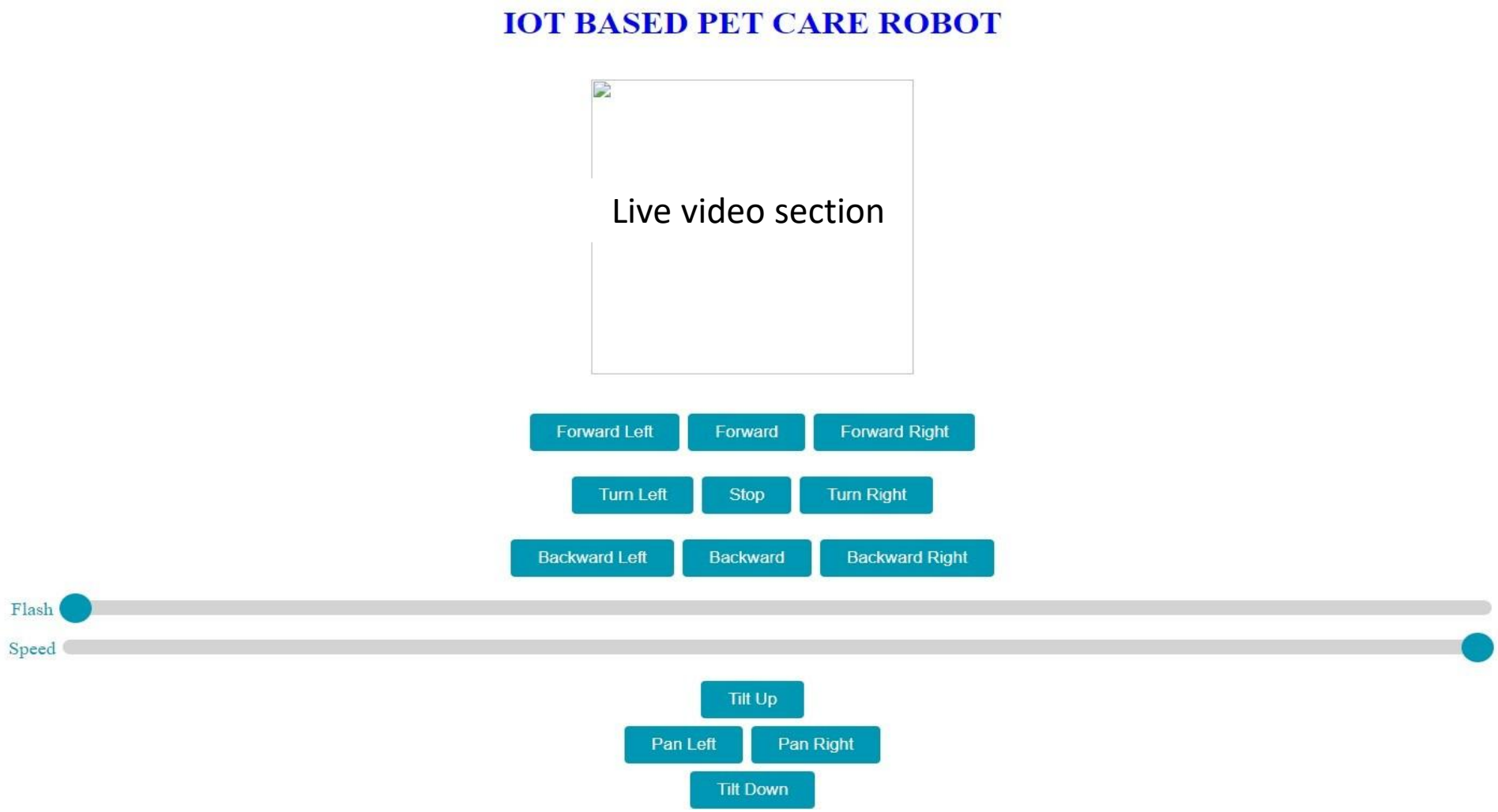
Circuit Diagram



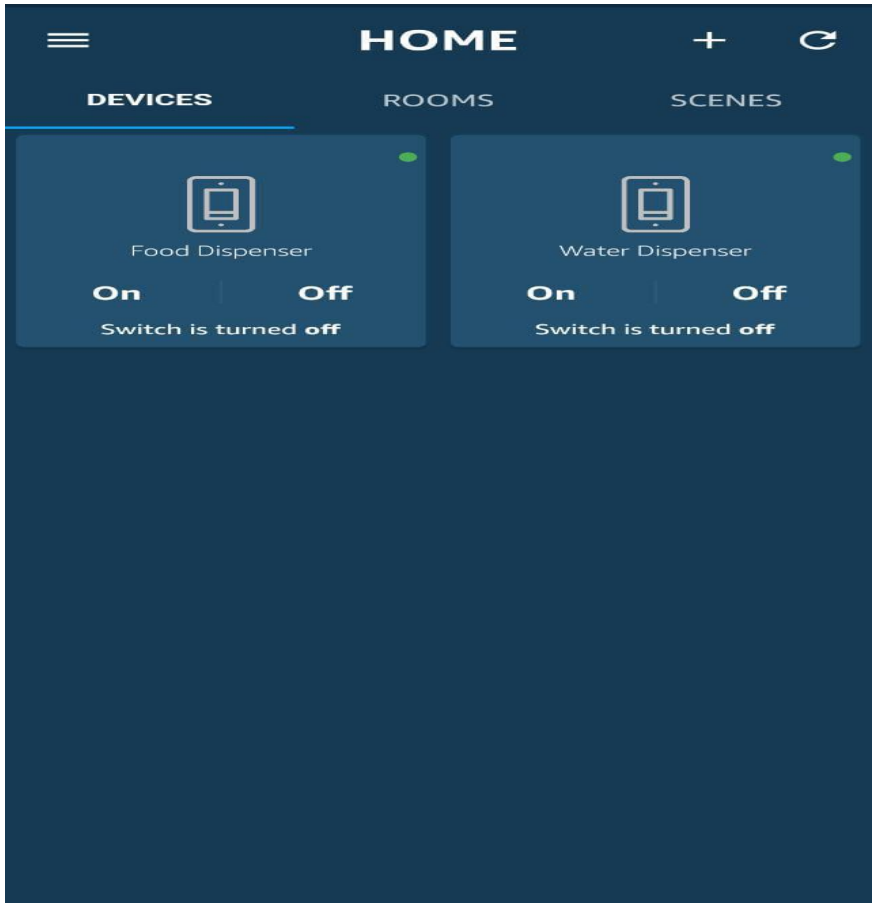
Circuit diagram for dispensing system



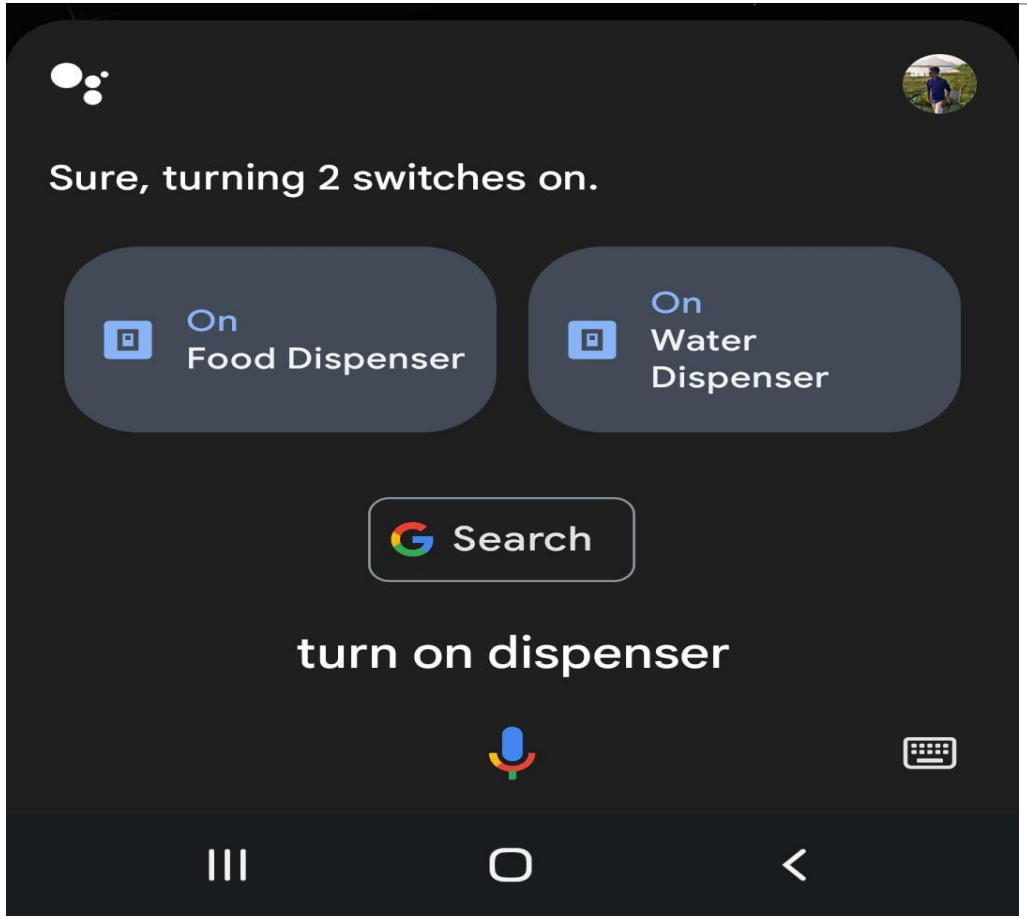
Webpage to Control the Bot

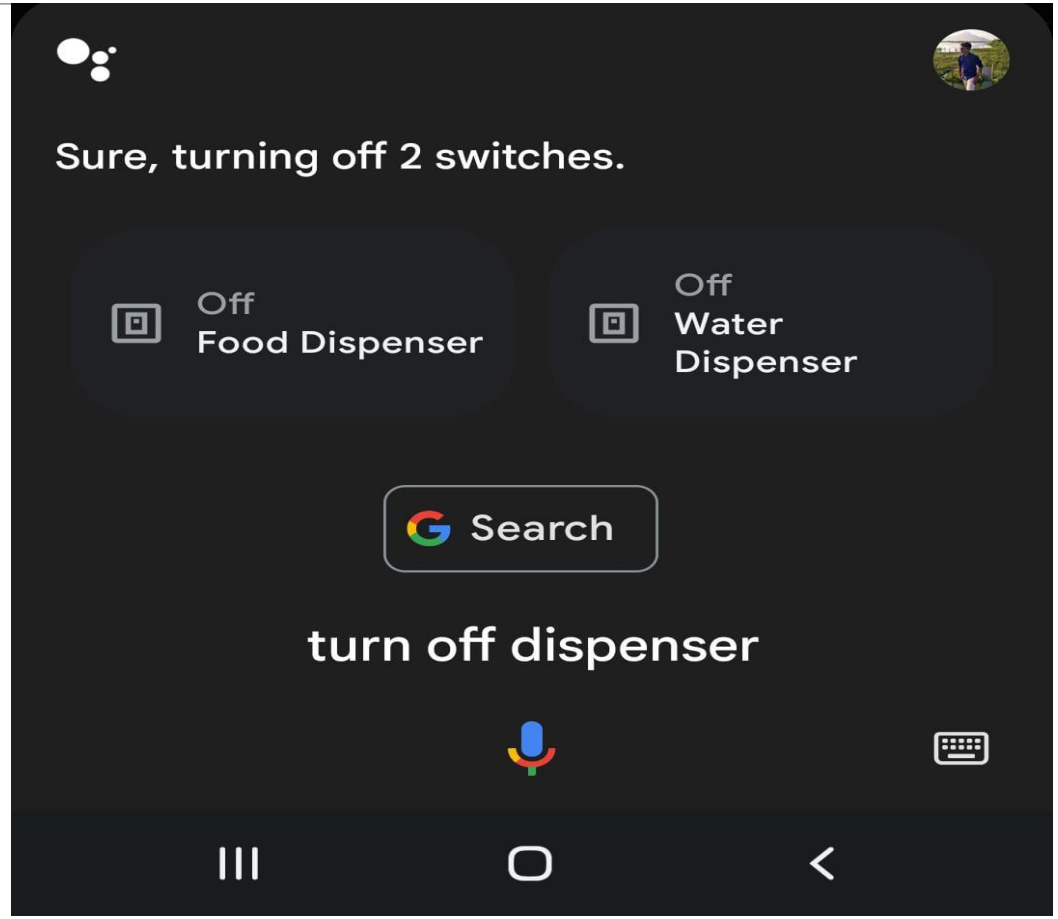


Sinric App to control the dispensing system

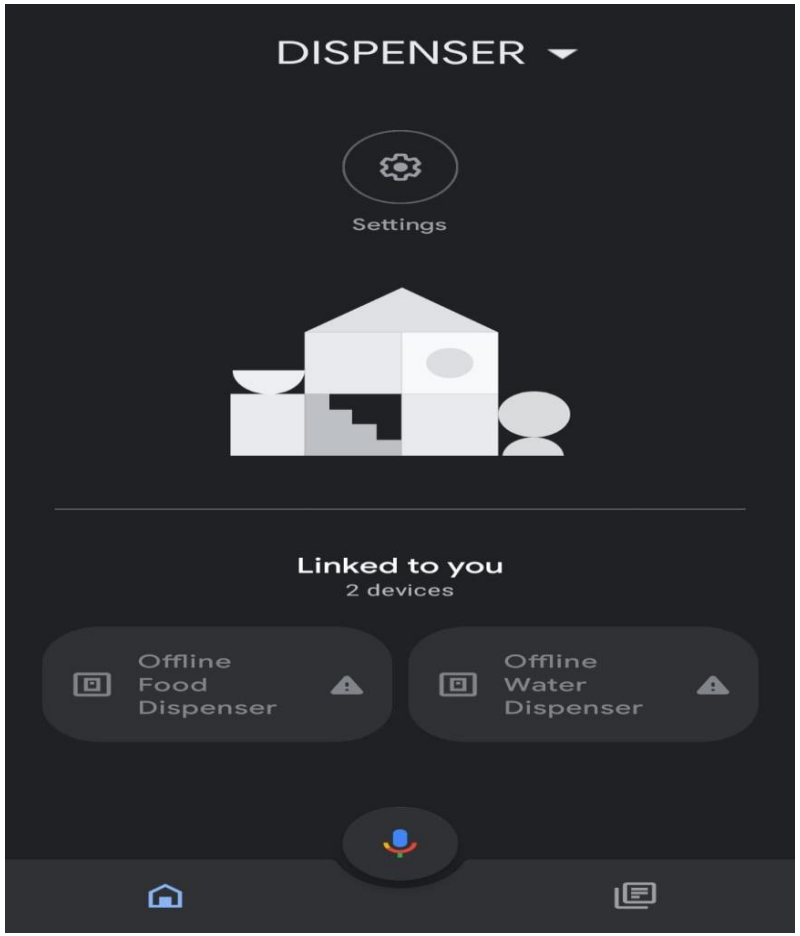


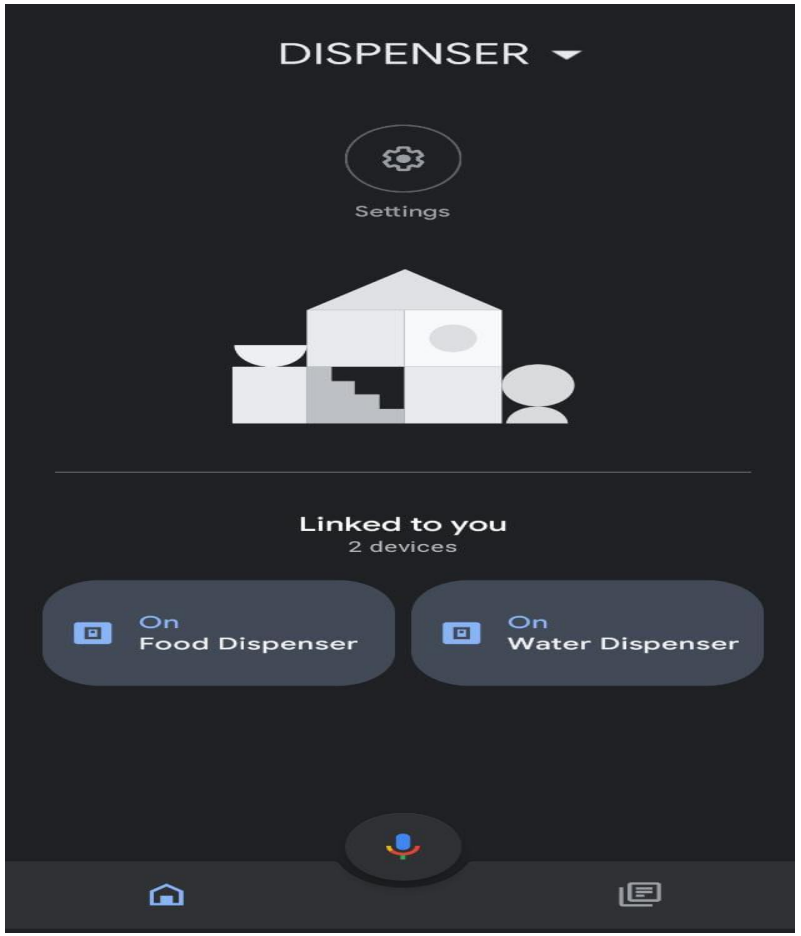
Controlling of the dispenser system trough google assistant via voice



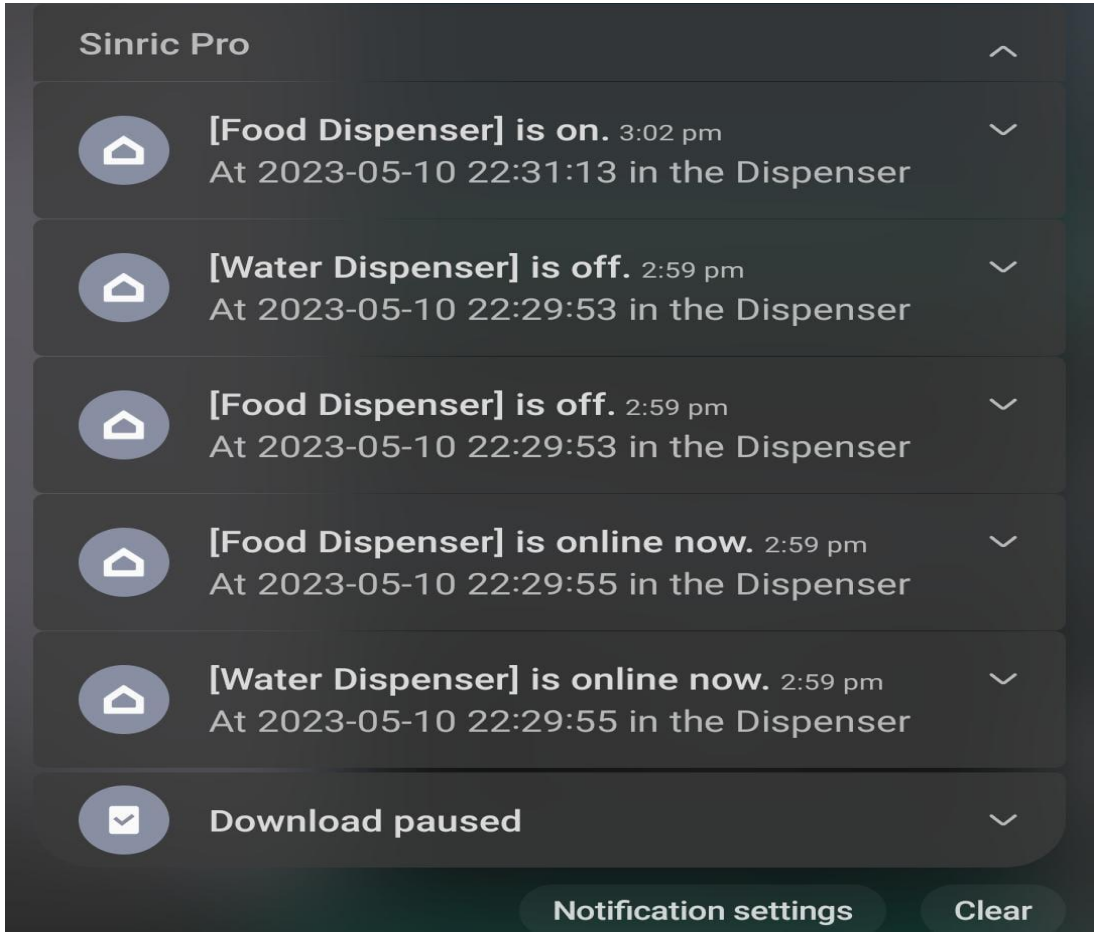


Controlling of the dispenser system through google home app





Notification of dispensing status trough the sinric app



Time Line

WEEK	WORK	STATUS
WEEK 2	PROJECT SELECTION &LITERATURE SURVEY	COMPLETED
WEEK 4	FINALISING OBJECTIVES &ANALYSATION OF COMPONENTS	COMPLETED
WEEK 6	DESIGNING CIRCUIT DIAGRAM OF RC CAR AND THE PAN-TILT CAMERA ASSEMBLY	COMPLETED
WEEK 8	DEVELOPMENT OF WEB PAGE USING HTML	COMPLETED
WEEK 10	DESIGNING CIRCUIT DIAGRAM OF DISPENSER SYSTEM	COMPLETED
WEEK 12	PROGRAMING ESP 32 MODULE FOR DISPENSING	COMPLETED
WEEK 14	MODELLING THE ROBOT STRUCTURE	COMPLETED
WEEK 16	FABRICATION & ASSEMBLY OF THE COMPONENTS	COMPLETED

References

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Future works

* The robot can be shielded with metal cage to prevent the robot from getting destroyed by the pet.

* The robot can be developed in such a way that i.e. the robot will be able to play and interact With the pet.

* The robot will be added with an another feature i.e. there will also be a video and audio interfacing option where the owner can interact with the pet. While the pet can also see the owner via a display kept on the robot.