

# B.TECH. PROJECT

## AUTOMATED DIRECTION DETECTING BOT

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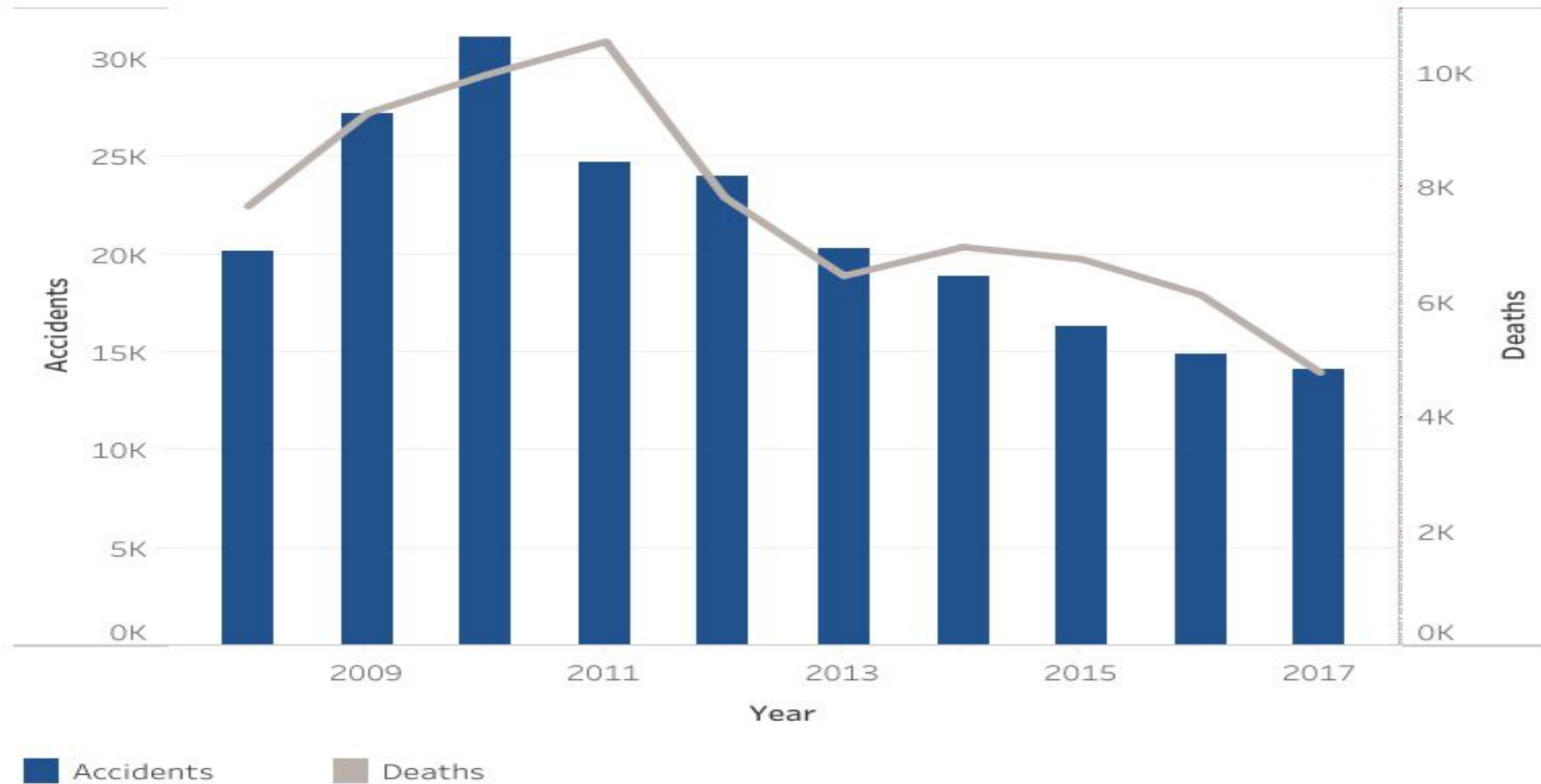
# OBJECTIVE

To create an automated wireless bot that captures an image, processes it and then traverses according to the direction detected while avoiding any obstructions in the path.

# APPLICATIONS

- Automated vehicles to move in constrained environment like wildlife sanctuaries and recreational parks.
- Helping people with disabilities to charter the course.
- Accident and collision prevention by using sensors and artificial intelligence.

# Road Accidents Due To Driving Under Influence Of Alcohol/Drugs, 2008-17



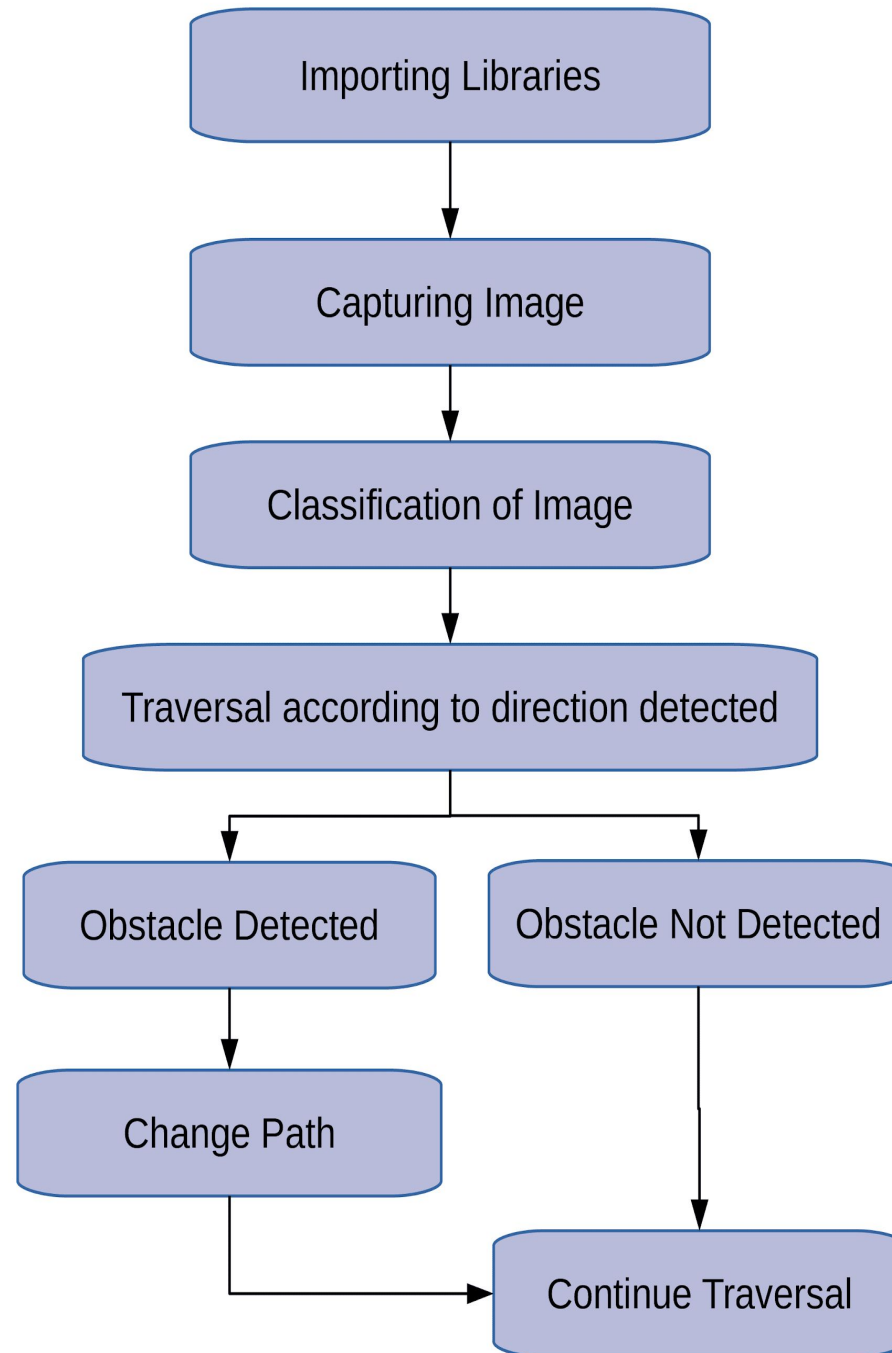
Each year more than 10% of accidents are due to intake of alcohol/drugs.

# How are we solving this?

- We are using image processing to get desired components out of the image which will be used further.
- Then using deep learning method named convolutional neural networks we detect and classify images.
- Also, according to our needs we are sending signals to the bot to move in certain directions and preventing its collision using ultrasonic sensors.

# INTRODUCTION

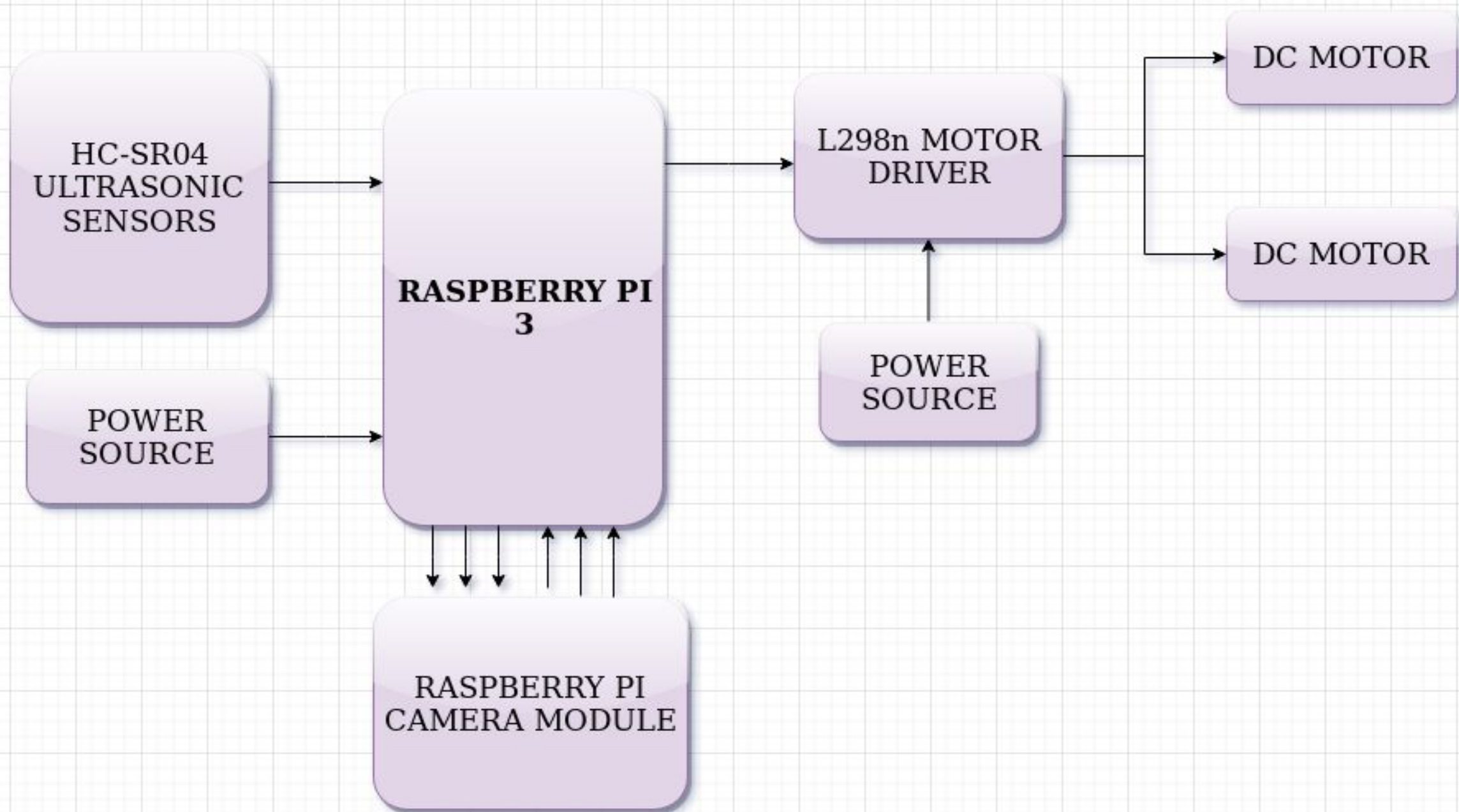
- The bot uses Pi camera attached to Raspberry Pi for capturing images which are then classified using TensorFlow and according to the direction detected the L298n motor driver is given an input which drives the motors and uses HC-SR04 ultrasonic sensors for avoiding obstacles in its path.
- We have used two power sources of 5V and 9V to drive Raspberry Pi and L298n motor driver respectively and to make the bot wireless.



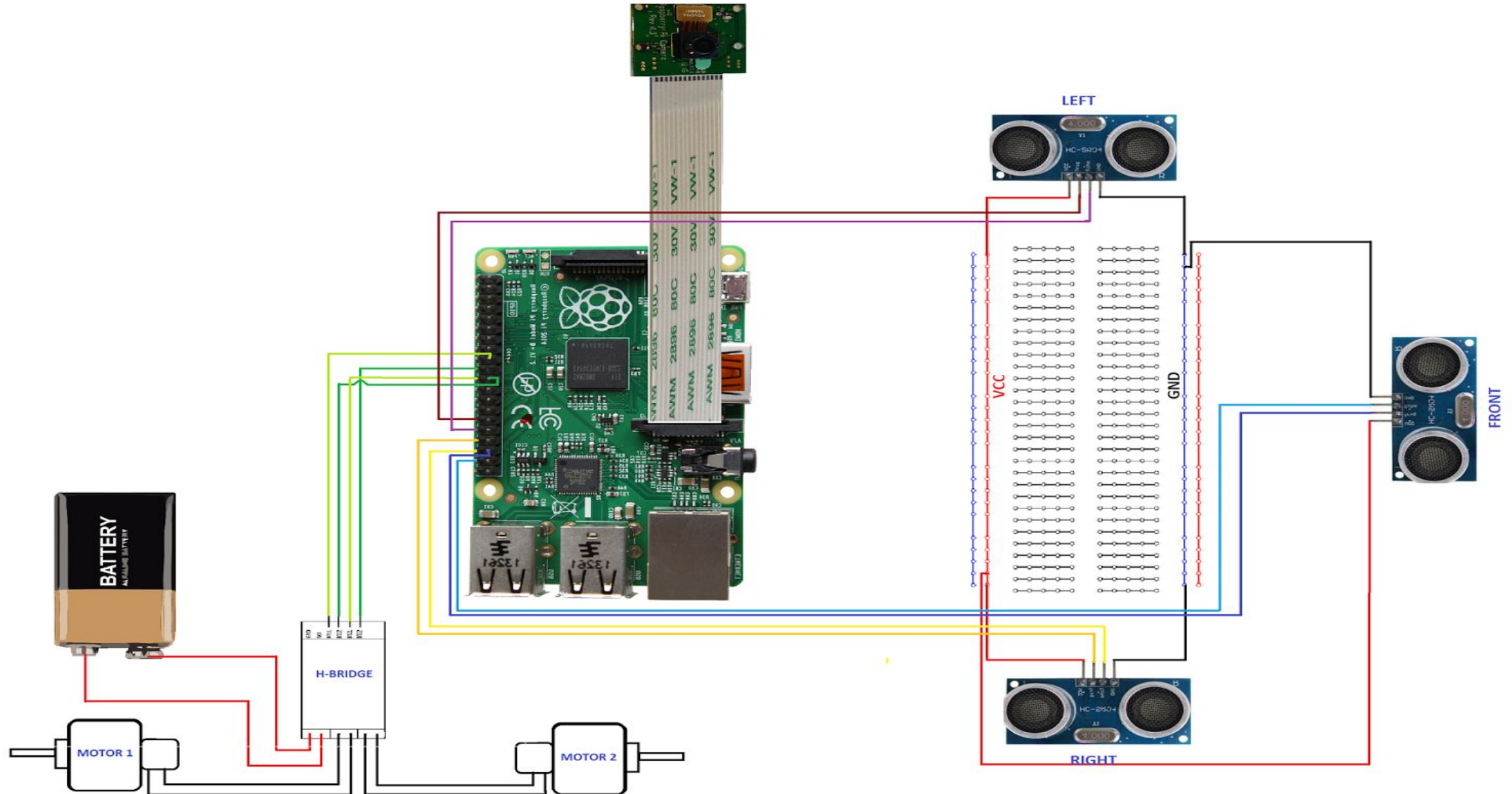
# Components and Technologies

- Raspberry Pi 3
- Raspberry Pi Camera
- L298n Motor Driver Module
- TensorFlow
- Python
- SSH(Secure Shell)
- VNC
- DC Motor
- Power Source for Raspberry Pi

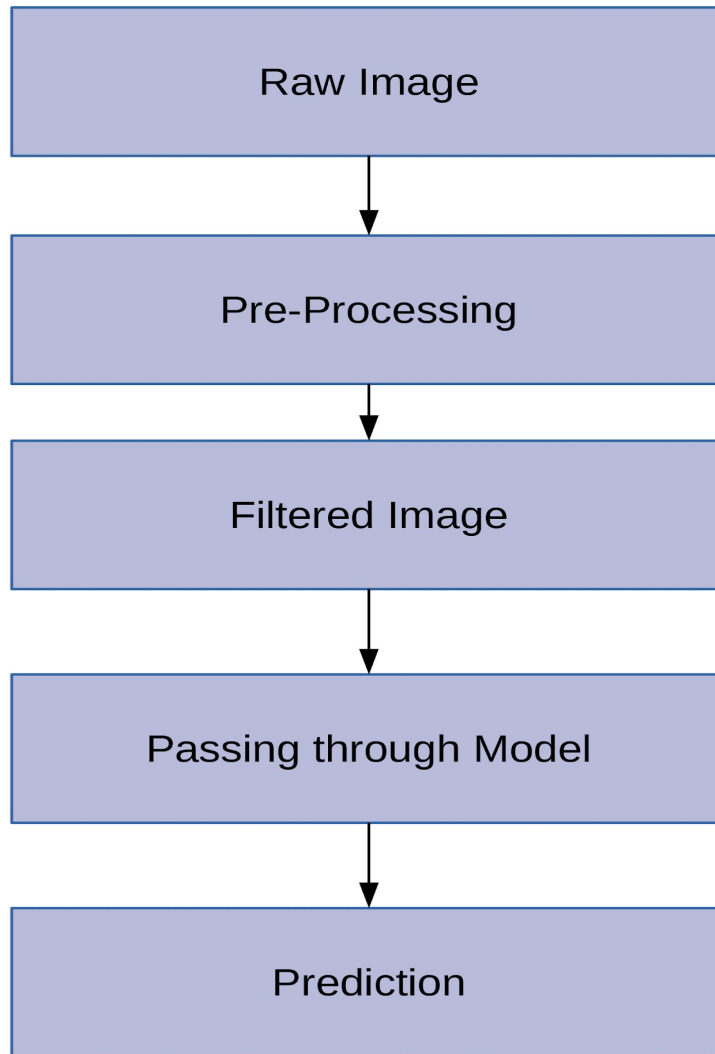




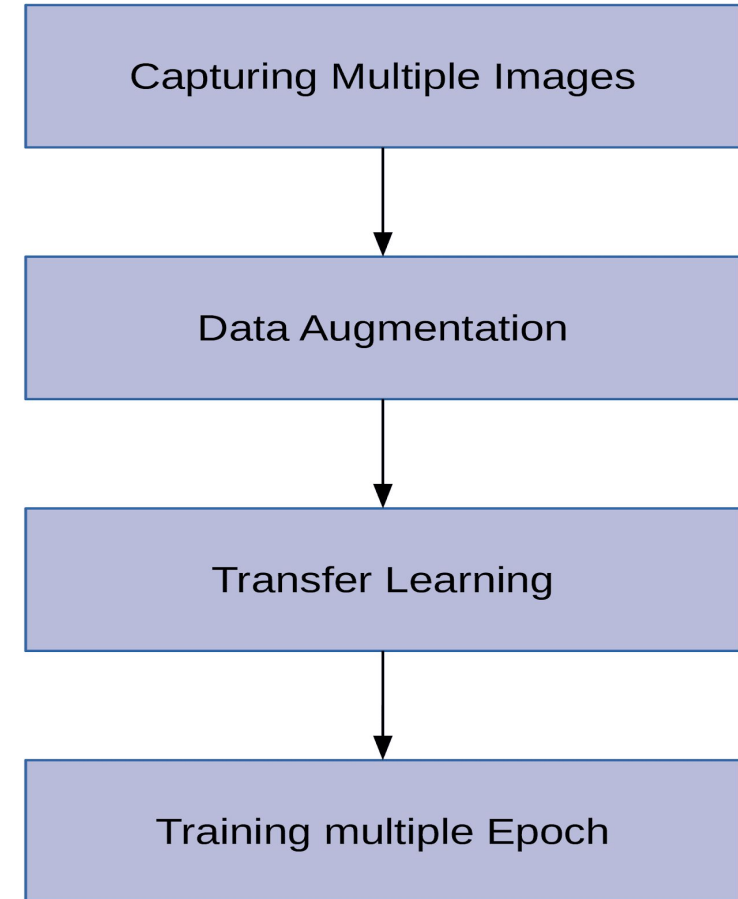
# Circuit Diagram



## Testing Phase



## Training Phase



# Problems Faced

## Creating the dataset

- Manually captured hundreds of pictures in different setups.

## Installing correct dependencies

- Raspberry Pi uses specific versions of dependencies and libraries.

## Hardware problems

- Proper calibration of motor speed, sonar sensors and making the bot wireless.

## Model Selection and Training

- Selecting suitable classifier with minimum loss error.

# Possible Work for Future

- Increase the accuracy in the prediction of directions.
- Reducing the time required for classification.
- Voice control to provide override commands.
- Send mass classification requests to server and redirection of multiple bots simultaneously.
- Multipath traversal using colour coding.

**THANK YOU**