# A Locomotive Voice-Based Assistant using Raspberry Pi

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**Abstract -** *Today's chaotic world is immense, with new technologies emerging now and then, which makes our life more comfortable and everything we can get just in a blink of an eye. Humans do work hard with new technologies to make the best out of it, and still, we need different kinds of artificial assistance, which in our layman's term, we can say Social Robots. They are most Sky-Rocketing Technology which is ever made and which helps with social cause, even though we have smartphones, laptops but still we need to do our work efficiently, so we ended up discovering Self-assisting robots which are like icing-on cake which makes our day to day life easy by helping us with bringing things through voice-assistance, Facial Recognition, pickup and drop things which are done by us in our daily activities. These works describe the design and mechanism of a robot by making prepositions. This paper discusses features like Voice Control, Face-recognition which are used in our daily activities.*

*Key Words***: Sky-Rocketing, Self-assisting robots, Facial Recognition.**

## 1. INTRODUCTION

Our life is just solely relied on technology, like today every human being on an average uses smartphone for an hour or more which shows how dependable or more than that we can say how technology-driven our life has become which paved us to that things to create Social Robots which are just like human being only we without experience, even though we are capable of doing anything on our own but still we need some assistance which makes our life unique and straightforward, and this leads to generation of Social Robots in this Era which deals with AI, IoT and makes that Robot intensively sharp and smart which makes our work done by more than half of it's working efficiency. By using facial Recognition and voice assistance in robots, it can clearly detect and follow our commands and can also be helpful to needy people who are not able to do things on their own. Even we can keep it cost-Effective so Everybody can afford it and can get the benefit of its features and nowadays due to scarcity of skilled people in some jobs this Robot comes into picture just by playing the role of labor and help in whichever field it is needed. Even in Culinary Experiences, we can make use of that Robot by training him with the correct amount of Dataset so that cooking can be done with reduced time, and additionally, you get top-notch quality. Even we have smart cities, smart townships which are solely IoT, AI based trained in such a way that they don't cost humans a single effort.

## 2. SYSTEM ARCHITECTURE

### 2.1.a Existing System:

As there is a lack of assistance for daily usage, we are facing problems, or we can say tasks are not done quickly. We do have Voice assistant Robots, but it only supports voice-recognition which is a fundamental feature we are getting in other voice-assistant as Alexa or google home, but for instance, for Blind people, we don't have a bot which Supports Voice-assistance as well Locomotion with Face Recognition which also helps as a social cause.

### 2.1.b Proposed System:

Social Robots or Self-assisting Robots will play an essential role in daily functioning activities and provide them reasonable assistance with its features. These Robots paired with Voice-assistant as well as with locomotion with the help of tetrawheel setup can help to travel with an ease or in a nutshell, we can say that it acts a supporting agent for a human being an additionally Face-Detection will also get implemented to make that bot more accurate, or we can say we will give an Eye to the Robot which reacts on surroundings accordingly and would provide an output based on that.

## 3. MATERIALS USED

Core Components including hardware and software are Chassis which is acts as a Skeleton of Robot which will be talking overall load of Robot, Wheels which assist Robot to move Anywhere within the Range, Power Source of 12v which starts overall functioning of Robot, Raspberry Pi which acts like CPU for Robot through which all necessary operations such Voice-Assistant, Face-Detection, Movement will be performed, Jump Wires which are used for internal connections of hardware with Raspberry Pi, SnowBoy Program which will be implemented for Voice-Assistance, Ultrasonic Sensor for handling low-frequency signals, Logitech Webcam for capturing images for Robots which will act based on Dataset provided, Speaker for getting Output from Robot by training it with different Datasets.

## 4. METHODOLOGY

The initial part is to implement voice detection to the bot using Snow Boy Voice Detection Program, Which is smooth and lightweight and faster than other voice detection

programs. It also uses less memory of CPU, thereby using most of that memory using Raspberry Pi. It detects 'n' number of voices as it trains with each kind of voice, and it uses less internet server and more Raspberry Pi's memory. It also has Security Feature which lets you train on any voice command, and it is smooth to operate because it hardly uses CPU ram and even it is super adjustable with any kind of voice input provided while training with Dataset and can even train the bot in chaotic conditions so it can reply accurately with what is being asked and also it can be trained with different languages based on specific requirements.

The second part is to implement Face-Detection to a bot for working as a learning agent from surroundings through different datasets provided by various machine learning libraries. To train this model in such a way that it can see an image ex. A ball and will try to initiate that picture in

datasets through co-ordinates, and we have used the Tensor Flow library, which is the Machine learning program that actually trains the object detection model and compares new images/videos to classify them and detect objects within them. COCO model is implemented to train that bot with different datasets so it can provide approximate output by judging surroundings, and the more it gets exposure with different datasets, the more it gives the accurate output. It can even modify every command as per Requirement.

Now, the third part and the most crucial part is movement of the bot as it a moving bot, and it uses a Tetrawheel support to move in any direction based on where that object/human is and implemented web-cam servo tilt mechanism because if the objects are way taller than his range then it needs to tilt in that direction to analyze that figure in that Dataset and while moving the bot needs to firm grasp of image so tilting and stabilizing are the key things which are necessary.
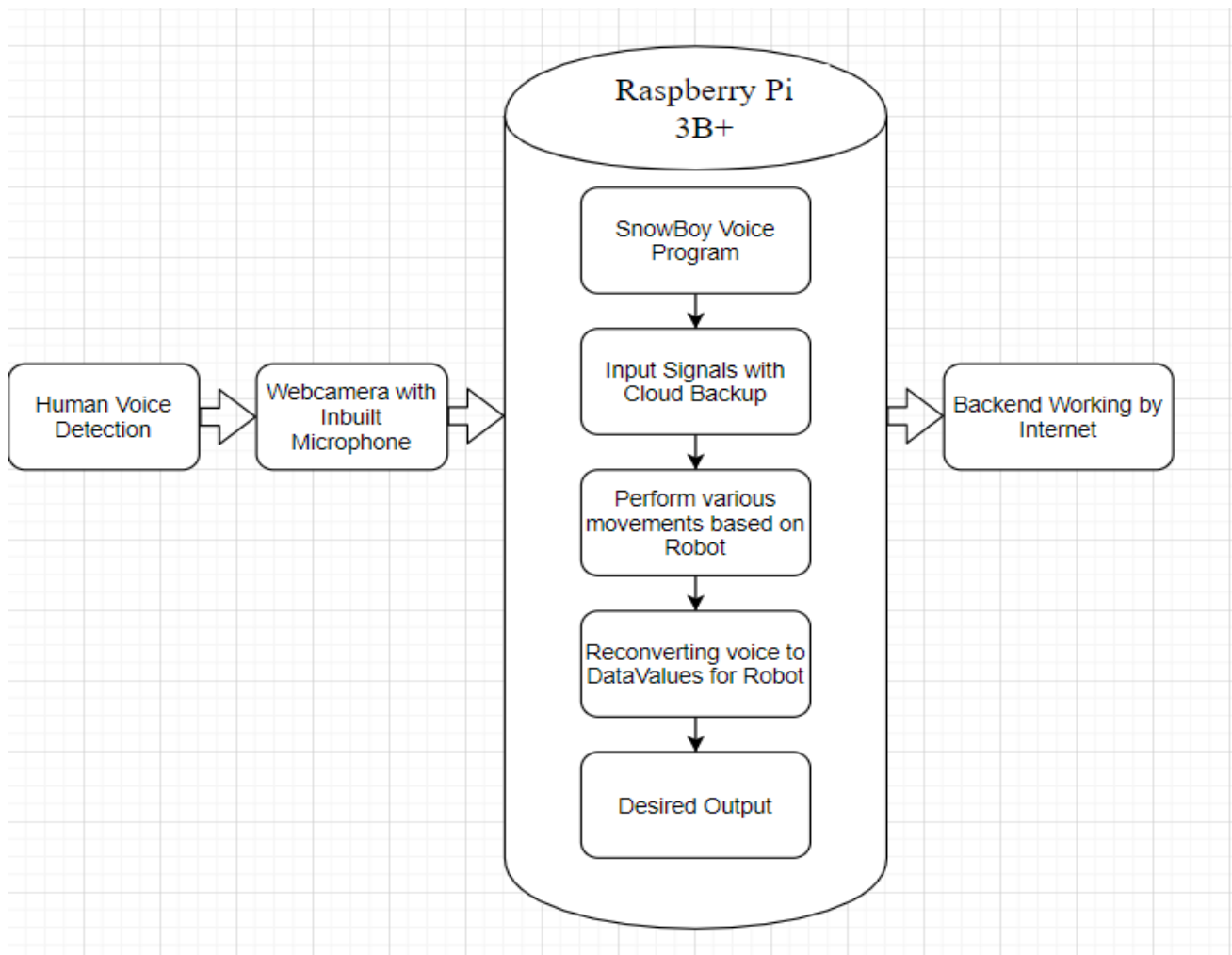


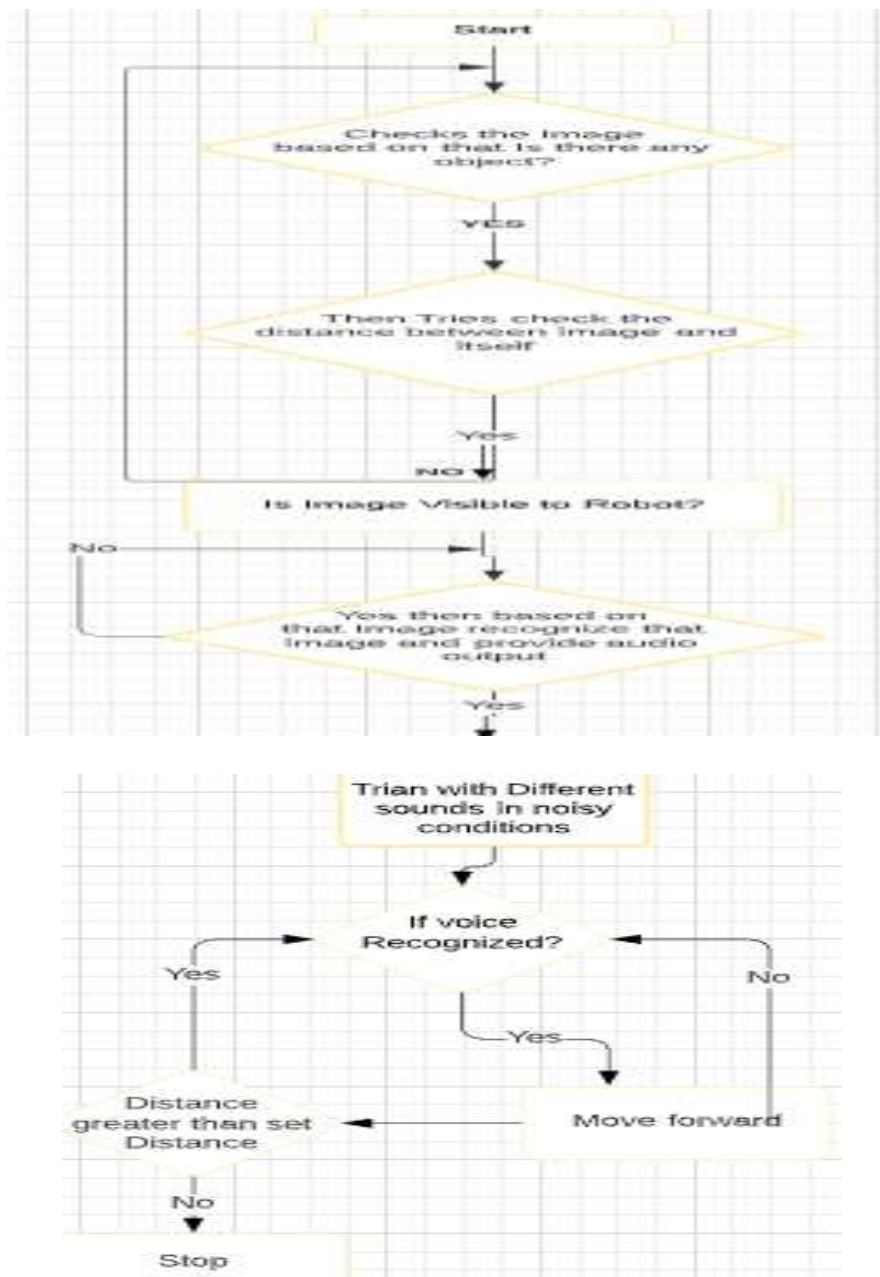**Figure -1**: Flowchart of Voice-Detection

**Fig -1**: Overall Flowchart of Working

## 5. FUTURE SCOPE

As of now Robot will work on Facial Recognition as well as Voice-Detection it can further also be implemented with additional functionality of Pickup and Drop of Objects using Robotic Arm, and this can be achieved by Servo motors, and as an add-on, we can train Robot with different datasets of emotions which can make Robot just like a human being, which will act based upon that input and provide required output.

## 6. CONCLUSION

Hence, Robots are nowadays a helping hand in our technological life as it makes human life easy through implementing various exceptional features like Facial Detection, Voice Assistance, movement, and so on. We can say that whatever logic this Robot needs to be trained as per the requirements it can be trained, and it would be beneficial in real-life problems and with social cause even this bot can act a traffic policeman which will maintain work accurately, and no chaos will be created as bot will follow set of rules which are embedded. In a nutshell, Robot is like our next family member, just without life but is trained on various datasets.

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