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RAILWAYS RELEVANT-DEPARTMENT DROID (R2-D2)

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Abstract: R2D2 is an AI- driven assistance robots to enhance passenger experience. These autonomous robots have conversational skills, mapping abilities, and exceptional sensors. R2D2 uses AI that enables recognizing questions and providing answers. The robots have been deployed at railways to assist customers with directions and other train information. From a software perspective, when there is an obstacle in front of it, the robot must find the best way to move over. We had some trouble making the robot understand that the trolley collectors that push the trolleys back to their place are a moving obstacle. We had to tweak the software umpteen times, shows videos and captures photographs of the floor, as well as helps connect the customer/passenger to any help desk through its image recognition features. Added with great ground sensors, R2D2 can detect obstacles that are stationary or dynamic. If a passenger suddenly comes in front of the robot, it will stop. It is equipped with SLAM (Simultaneous Localization and Mapping) technology that helps it map the entire railway station.

Keywords: Mapping ability, SLAM (Simultaneous Localization and Mapping), conversational skills, software umpteen

I. INTRODUCTION

R2D2 is an AI based robot which helps in railway stations as a real time TTE and also gives other information about available resources at the station, the look of R2D2 was taken from an available character from star war Initially R2D2 welcomes the passengers and validate their tickets, helps the passengers to address some information about their current journey details and also gives information about available resources at the station and helps them to navigate.R2D2 also notices the suspicious activities happening in the station and inform it to their respective departments. Through R2D2 we are providing a seamless connectivity between the resources of railway stations and the available facilities. This robot helps misguided passengers by providing the right information about their journey to get into their respective trains on time. It also informs the suspicious activities in the railways environment and inform to the respective departments in the railway stations.

- To welcome the passenger and validate their tickets.
- To guide the passenger to get their trains at respective time.
- To allocate the available resources by mapping.
- To recognize the passengers and forming a formal greetings for next time.
- To notice suspicious activities happening in the station and inform to respective departments.

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II. METHODOLOGY

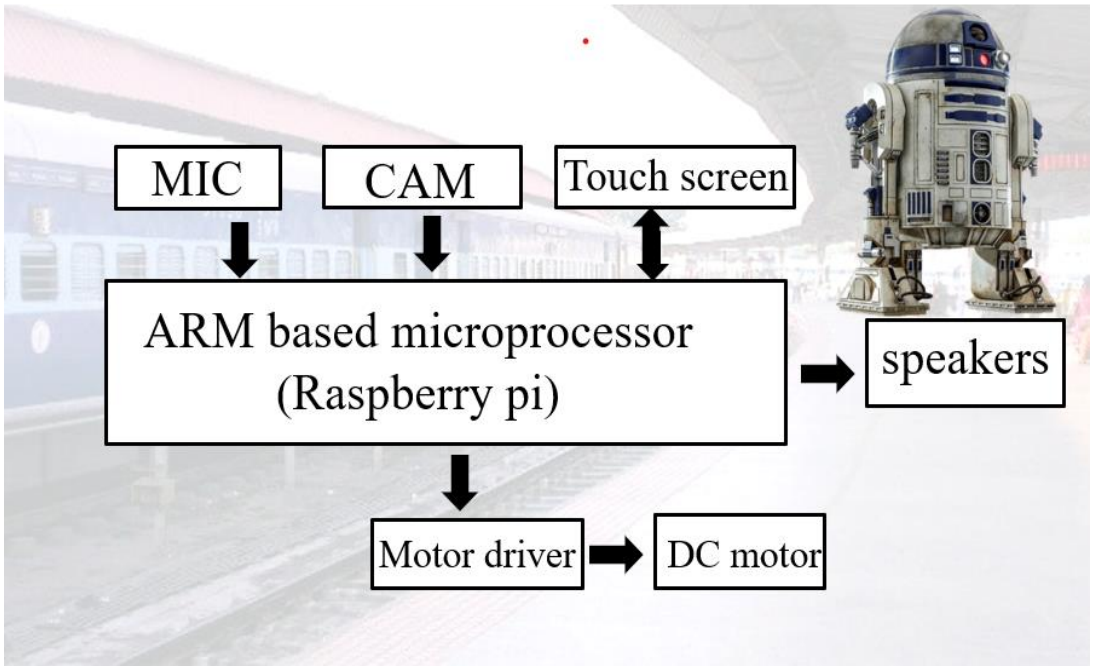

Figure 1: Block diagram of R2D2.

R2d2 has two main functions they are voice assistance and face recognition work on AI, which is coded using python and other hardware works with the help of a microcontroller is programmed with embedded C. • The whole AI runs on an ARM based microprocessor (raspberry pi). Which is generally a mini computer using python an AI is created to corelate with above functions and rest of the moving parts of the robot is controlled by a 32bit microcontroller (Arduino) with the help of the output given from the raspberry pi (GPIO pins).

Figure 2: Representation of R2D2's voice assistant.

The voice assistance takes input from mic in the form of speech. which is later converted to text using a library from GitHub, there are few wake words it will be recognized by the R2D2 and give proper replay for the wake words which are predefined in the program, here the text is again convert into speech which is sent to a speaker.

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Figure 3: Representation of R2D2's main function face recognition.

Face recognition takes input from a cam it captures pictures at real time they are stored in the folder. Using OpenCV the pictures are compared with the pre trained pictured which are already stored. If a match is found the robot will reacts with the help of predefined comments.

III. FLOWCHART

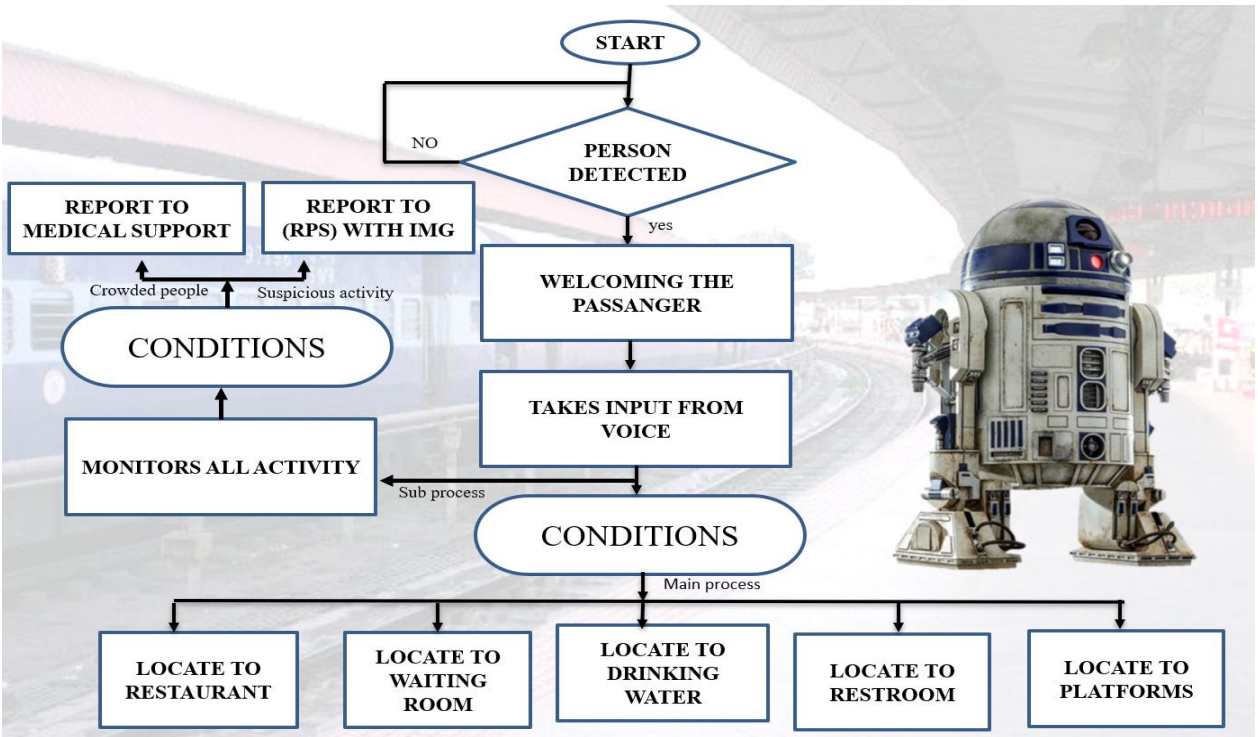

Figure 4 flowchart.

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IV. IMPLEMENTATION

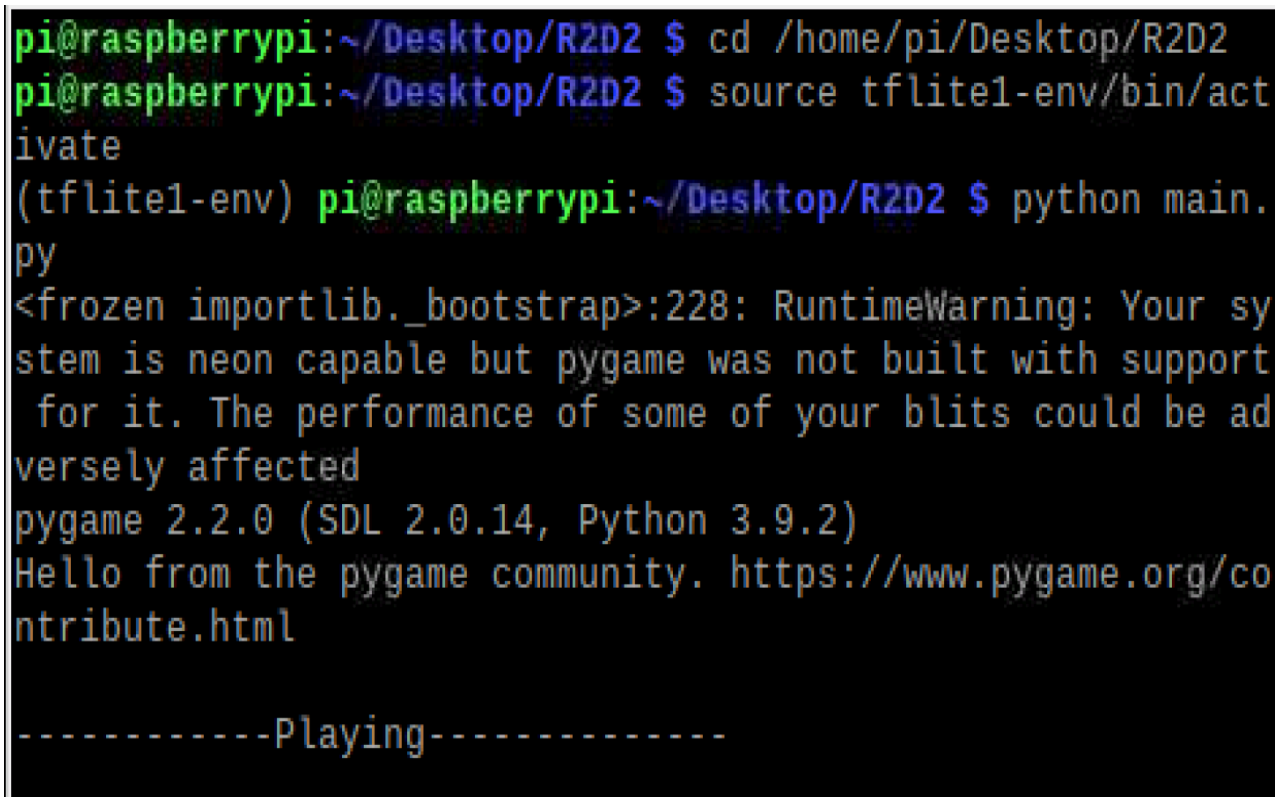

Figure 5 welcomes the passengers and answers to there query and validate there tickets.

Figure 6 will take passengers to the nearest restaurant available in railway.

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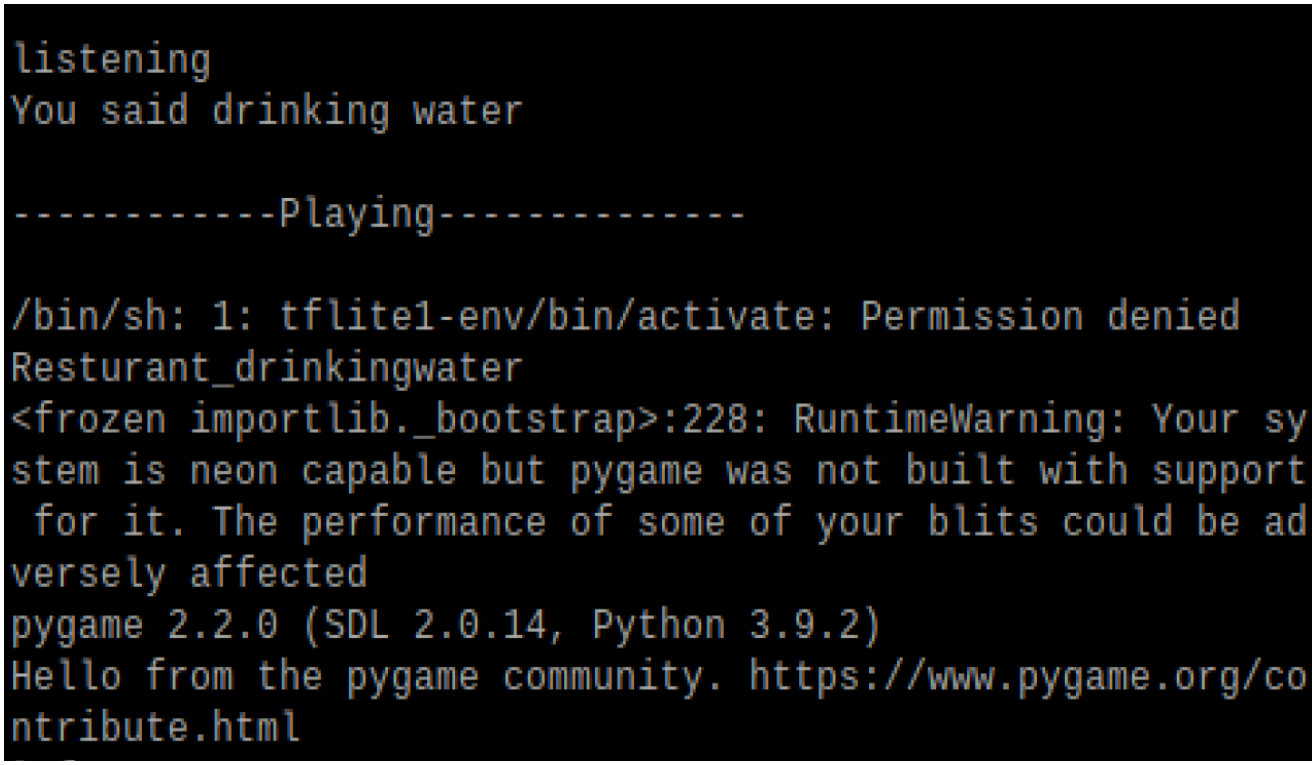

Figure 7 will take the passengers to the nearest drinking water source.

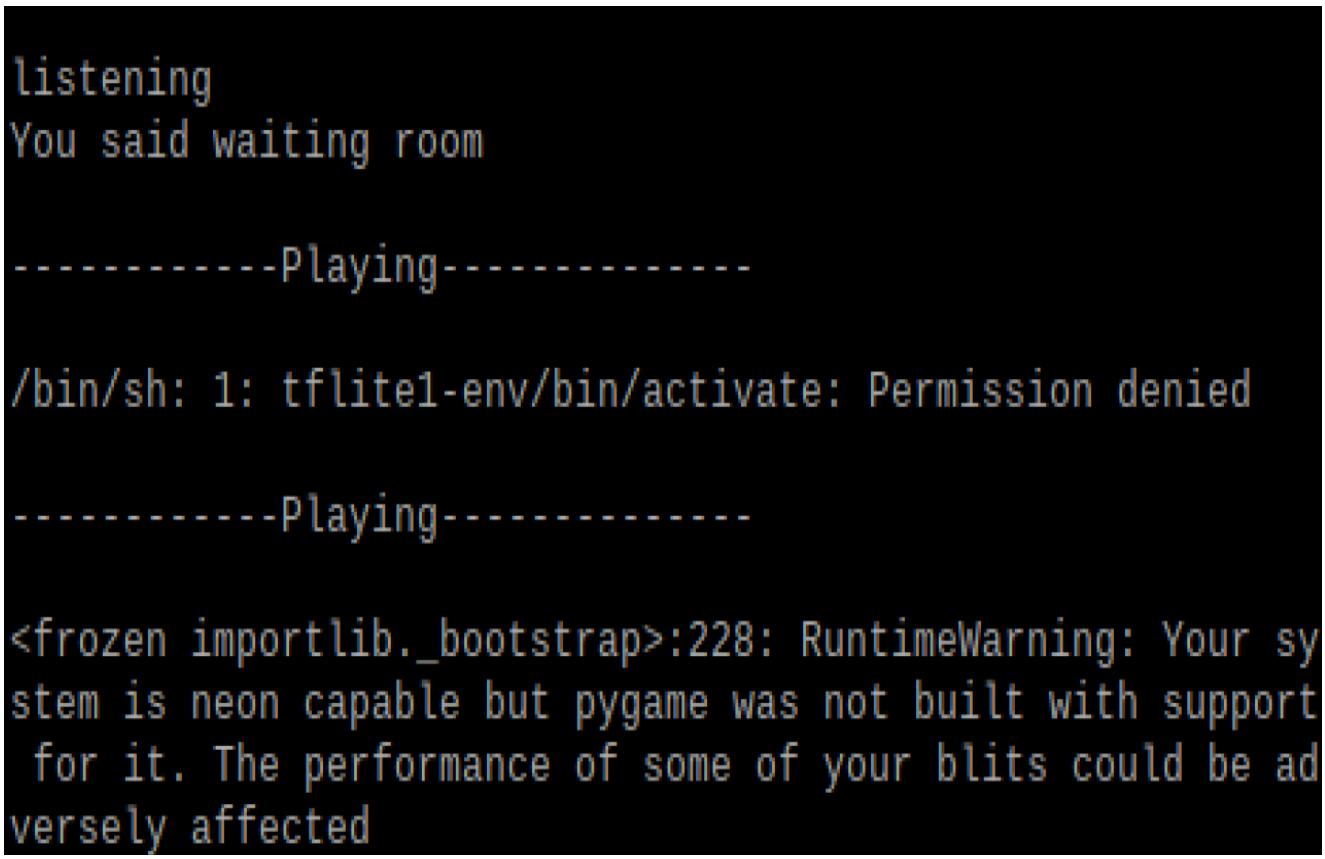

Figure 8 will take the passengers to the nearest waiting area

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V. RESULT

Figure 9 : Railway relevant department droid

This robot helps misguided passengers by providing the right information about their journey to get into their respective trains on time. It also informs the suspicious activities in the railways environment and inform to the respective departments in the railway stations.

VI. CONCLUSION

R2D2 (railways relevant department droid) is a robotic project taken to serve guidance for the passengers who has lack of information about the railway station and its available resources by mapping.
R2D2 monitor all activity in it way repots to respective departments like Railway police service (RPS) and Railway medical support (RMS).
R2D2 widely helps every passenger to get their trains at their respected time. These robots are also capable of escorting passenger in the railway station.

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