

Synergy 2023 Project - Proposal Review



Project Title - **Auto Rover**

Theme -

Tentative Budget - **INR 61,000**

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OBJECTIVE

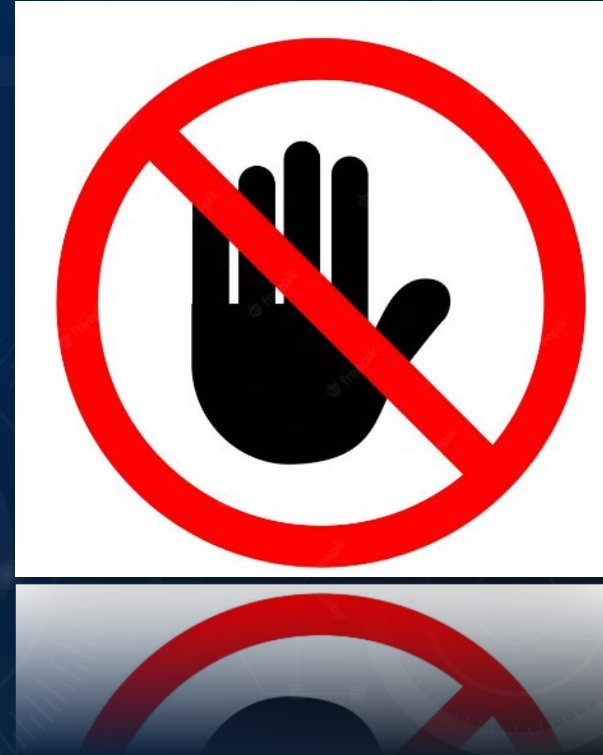
We present a prototype of a human following robot that uses Raspberry PI and different sensors for detection and following an object.



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Problem Statement :

- The spread of contagious diseases like chickenpox common cold is faster among nurses then normal population.
- Our human tracking system is answer to this problem since it doesn't require anyone to interact with it..



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Solution :

- The applications of Human following robot are Smart Stretcher and Smart Trolley
- Smart Stretcher can be used to transfer patients in hospitals.
- To load heavy goods a smart trolley will be utilise to minimise muscle power and make work easier
- Moreover, they can be used while transferring goods at airports etc.

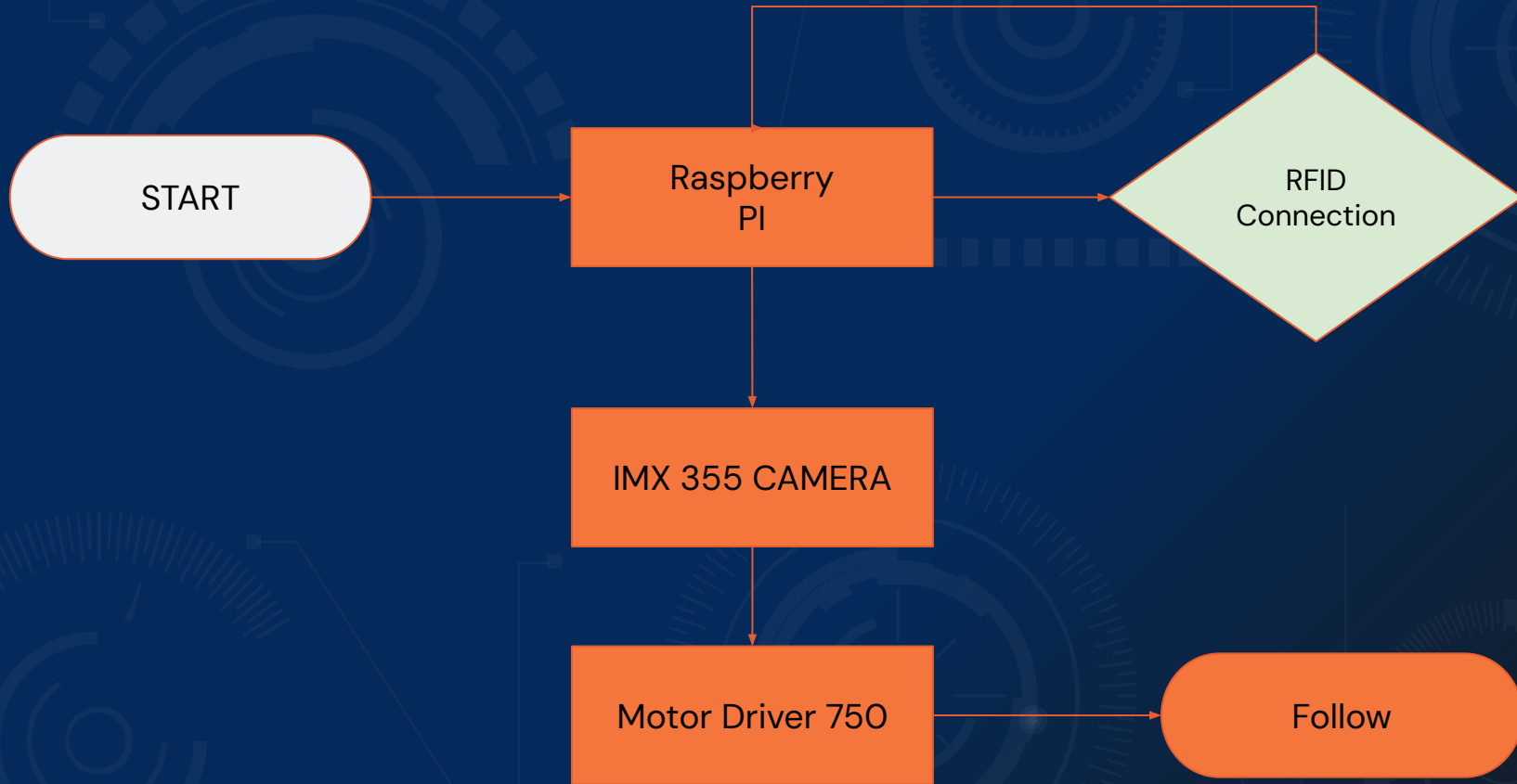
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Components:

1. Wheel chair
2. Raspberry Pi 8gb
3. 12 V LifePo4 battery
4. IMX335 camera
5. Motor Driver 750
6. Motor DC 250 W
7. Jumper Wires
8. Bread board
9. RFID Sensor 13.52MHz
10. RFID Tag 13.52 Hz

Tools needed :

1. Glue gun
2. Soldering Iron
3. Cutter
4. Screwdriver
5. Wire Strippers
6. Switch



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Selected Target Object (STO) :

Radio-frequency identification uses electromagnetic fields to automatically identify and track tags attached to objects.



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Working :

- Our system consists of a four-wheel robotic vehicle mounted with a separate microprocessor and control unit along with different sensors and modules i.e., ultrasonic sensor, infrared sensors ,RFID sensor which helps them to move with respect to people and objects in their surroundings.
- The above sensors work in unison with each other and helps the robot in its operation and to navigate its path by avoiding the obstacles and maintaining a specific distance from the STO(Selected Target Object).
- We used ultrasonic sensor and RFID sensor to maintain a specific distance for the object.

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Expected Outcome:



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Our prototype has 2 major stages -

Hardware

Our system will consist a four-wheel robotic vehicle mounted with a separate microcontroller and control unit along with different sensors i.e., IR, motor driver which will help the device to move with respect to people and objects in its surroundings. We will use RFID sensor for obstacle avoidance and to follow a selected target.

Software

To make the hardware parts workable we need to program the microcontroller. Here we will use Raspberry PI to give instructions by using embedded c language. If the range will be less than 5 cm, then the system will move backwards to avoid collision. If it's between 10 cm and 20 cm to it will move forward and beyond 40 cm no movement. We will give 180-degree rotation to move right and left direction. In this way our system will traverse the path in every direction.



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Tentative budget with a breakup

Items	Amount(Rs.)
1.Motor DC 250W X 2	Rs.18000
2. Raspberry PI 8GB	Rs. 8000
3. Motor Driver 750	Rs. 7500
4. RFID SENSOR 13.52 MHz	Rs. 8000
5. RFID TAG 13.52 Hz	Rs.3000
6. 12 v LifePo4 battery	Rs. 4000
7. IMX 355 CAMERA	Rs. 4000
8. MISC COMPONENTS{ Soldering wire, Wire Stripper Jumper Wire, Switch, LED'S Bread Board, Glue Gun Cutter }	Rs. 4000
Total Amount	Rs. 58,000

Thank you



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