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Wireless Robot Control Using MATLAB GUI

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ABSTRACT: In our project Transmitter at the transmitter end & Raspberry pi at receiver .We send commands to transmitter to move the car in a specific direction by pressing the corresponding push button in the GUI application particular push button when pressed executes call back function corresponding to that push button in the mat lab program. Metal detector is an electronic instrument which detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal objects buried underground. At the same time live capturing is also seen.

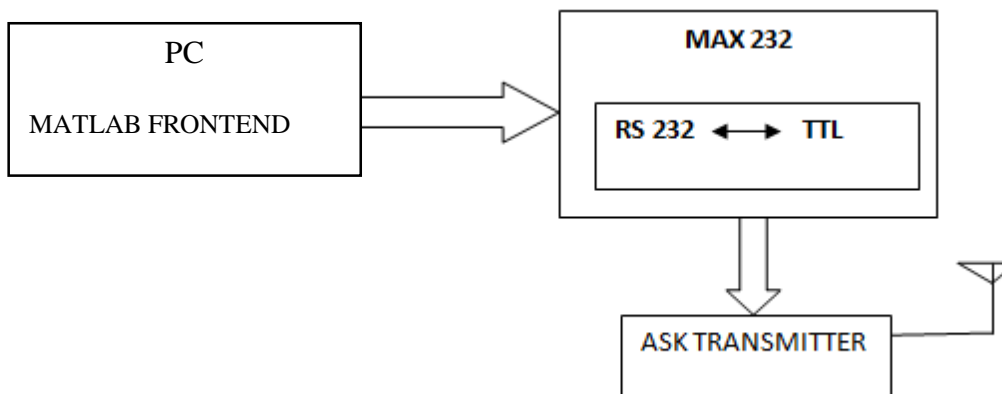
KEYWORDS: Transmitter, Raspberrypi-3,Matlab

I. INTRODUCTION

Now-a-days we can see so many military people are lost their lives. People are joined in military has become a challenge at present days. & so many people are refused to join in military. This paper presents the implementation of a MATLAB based graphical user interface (GUI) to control the movement of a robotic car. The commands to move the car in forward, reverse, right and left directions are sent from the GUI and processed by a transmitter board and other side is used by raspberry Pi [ARM11 BROADCAM CONTROLLER] in the project respectively.By this robot we can detect the metal nearby & at the same time we can see the live capturing by using camera. In our project transmitter & Raspberry pi acts as transmitter and receiver .We send commands to to move the car in a specific direction by pressing the corresponding push button in the GUI application. The particular push button when pressed executes call back function corresponding to that push button in the mat lab program.

II. PROPOSED SYSTEM

Transmitter section



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MAX232:

In transmitter section we have mat lab frontend, max 232, Ask transmitter. MATLAB Frontend is connected to max232 interface this max232 interface is connected to ASK Transmitter. &ask transmitter is connected to patch antenna.

MAX 232: In our project max232 is used to send the data in serial communication. The max232 has 9pins we are using 4 pins for transmitter, receiver, ground, vcc. Remaining pins are not used in our project.

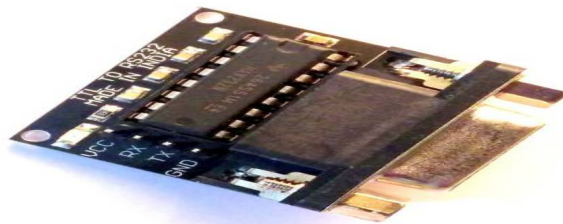


Fig2.1: MAX232 Transmitter section

MATLAB FRONTEND:

Matlab frontend is designed to move the robot in particular direction. In mat lab front end we have 5 commands to move the robot they are right, left, forward, reverse, stop. By using these commands we rotate the robot we press that particular button the robot move in that direction. We design these commands by using mat lab software. Fig below shows Mat lab frontend.

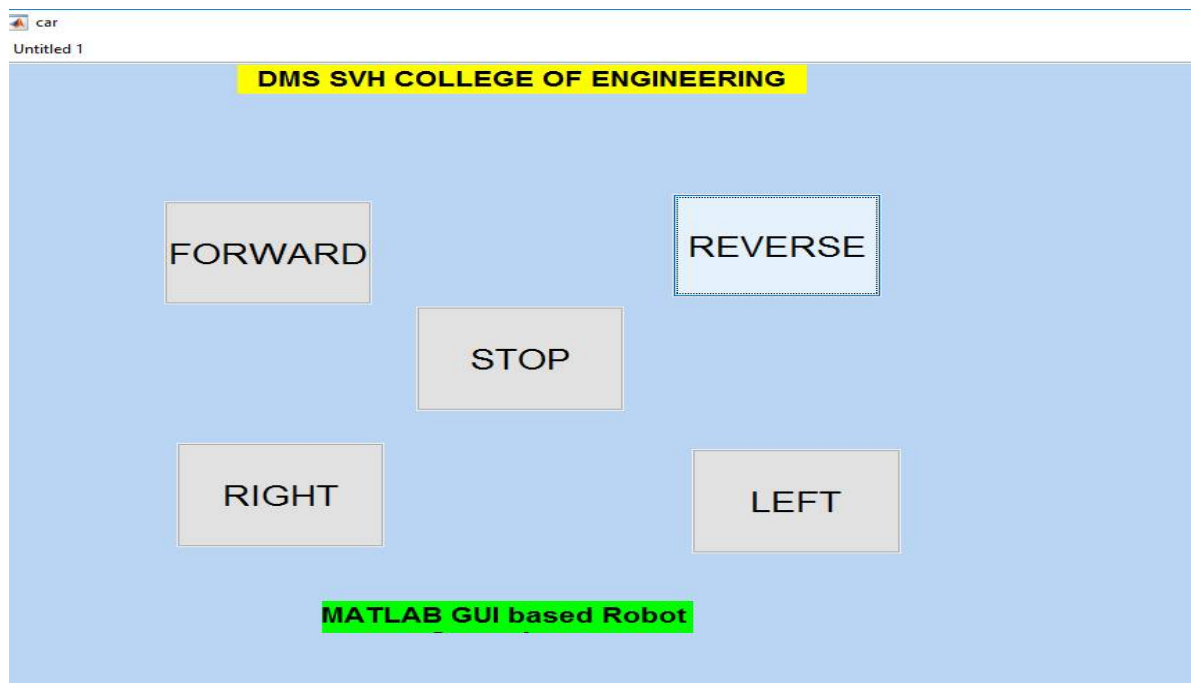


Fig2.2: Robot directions using matlab

RECEIVER SECTION

In receiver side we are using raspberry pi3 model B is used. In raspberry pi3 we have inbuilt Wi-Fi& Bluetooth is present. At the receiver side we have camera the camera is rotating 360 degrees we seen the live at the surroundings. L293D motors are using to rotate the robot in specific direction. Metal detector is used to detect the metal nearby&

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buried underground. If any metal detects the buzzer will rang at the same time we seen the live we easily identifies the metal. The potential divider is used to splitting the current equally given to all sections buffer driver is used to reduce the signal loss. Therobot speed is 100rpm. Fig shows below section

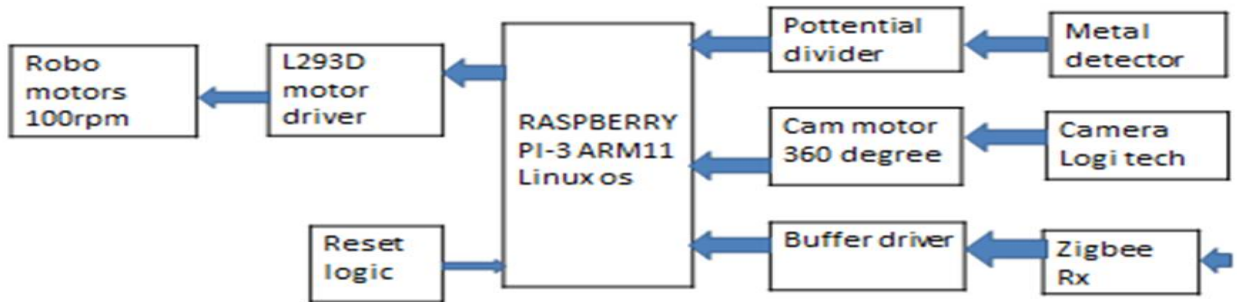


Fig2.3: Receiver Section of Raspberry pi



Fig2.4:RASPBerry Pi-3 ModelB BOARD

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. The Raspberry Pi 3, with a quad-core Cortex-A53 processor, is described as 10 times the performance of a Raspberry Pi 1. This was suggested to be highly dependent upon task threading and instruction set use. Benchmarks showed the Raspberry Pi 3 to be approximately 80% faster than the Raspberry Pi 2 in parallelized tasks.

METAL DETECTOR

Metal detector is an electronic instrument which is used to detect the metal nearby & which is used to detect the metal inclusions hidden within the object or buried under ground. It consists of a handheld unit with a sensor probe which

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can be swept over the ground or with in the object if any metal detects immediately the buzzer will rang there is a metal is present. Fig below shows the metal detector.



Fig2.5: Metal Detector

CAMERA

360-degree video is typically recorded using either a special rig of multiple cameras, or using a dedicated camera that contains multiple camera lenses embedded into the device. The resulting footage is then stitched to form a single video. This process is done either by camera itself, or using a specialized video editing software.



Fig2.6: CAMERA

III. HARDWARE IMPLEMENTATION

Fig below shows the hardware implementation of robot. Here camera module & metal detector is connected to raspberry pi. & mat lab frontend is connected to transmitter section. From the transmitter section we send the commands to move the robot.

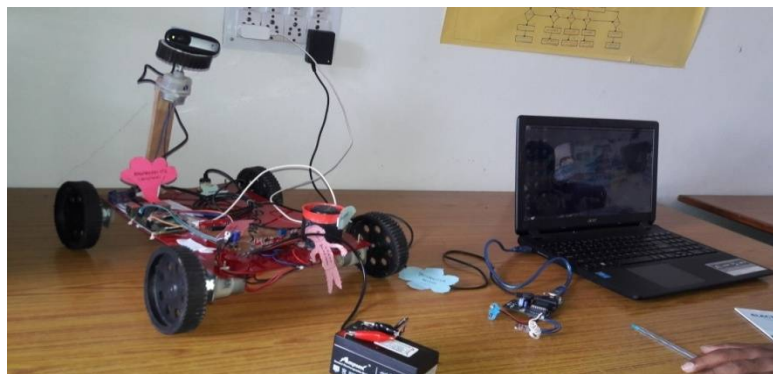


Fig3: HARDWARE IMPLEMENTATION

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IV. RESULTS

There are some results are obtained when the metal was detected the buzzer will rang. Therobot was moving in forward, reverse, right, left directions by using matlab GUI to increase the space of detection.



Fig4.1: Forward direction

Robot moving forward direction using matlab conditions



Fig4.2: Reverse Direction

Robot moving reverse direction using matlab conditions



Fig4.3: RightDirection

Robot moving Right direction to increase the space of detection using matlab



Fig4.4: Left Direction

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Robot moving Left direction using matlab instructions



Fig4.5: Metal detection

By observing this figure we can know that metal is detected and the buzzer will be on automatically.

V.CONCLUSION & FUTURESCOPE

The wireless robot is done efficiently with the proposed system. By using high range of sensors and instructions this robot will be more efficient. The future scope is if the robot can connect the call & immediately they can diffuse the bomb itself then it would be better.

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