



AUTONOMUS NAVIGATION: OPTIMAL PATH FINDING AND OBSTACLE AVOIDANCE SURVAILANCE VEHICLE

PROJECT PRESENTATION

BATCH – 2020-2024

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE)

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Flow of Presentation

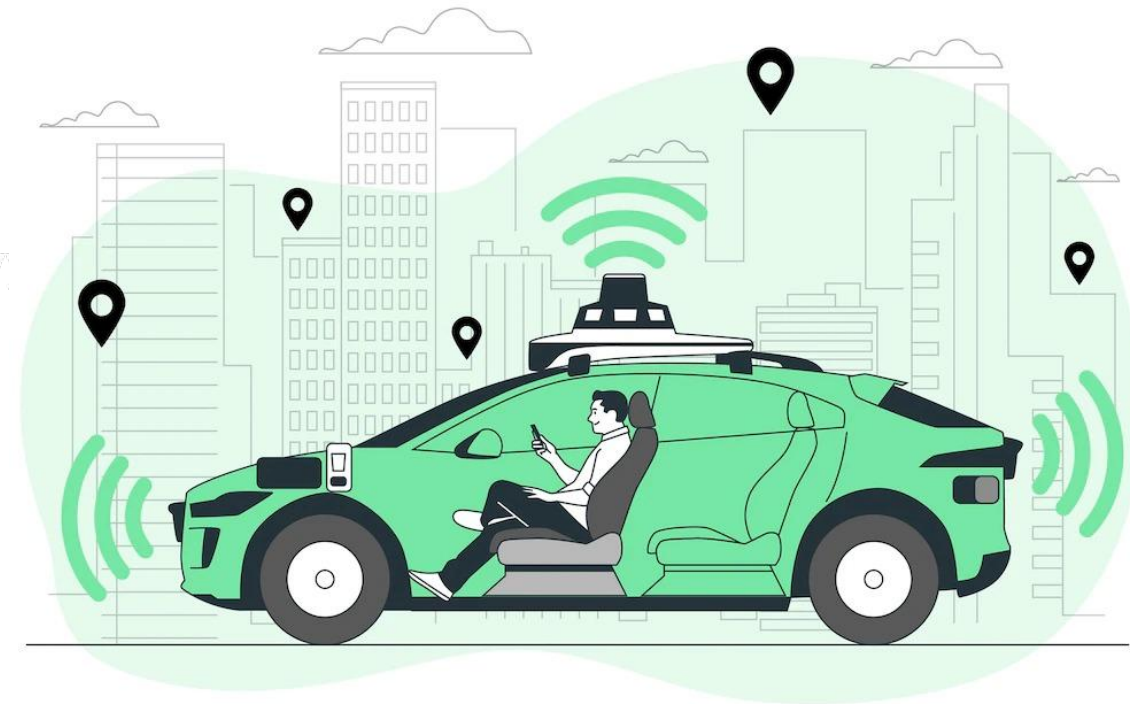


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Introduction

- ❑ The core of a autonomous car is to be able to drive on its own in directed path while automatically avoiding obstacles
- ❑ Autonomous car uses various sensors such as ultrasonic sensor to detect and avoid any object in close proximity
- ❑ On a technological level, this car is built using several engineering disciplines such as electrical, mechanical, computer sciences, and control engineering, among others
- ❑ An ESP32 camera can be used in a car for live video streaming with facial recognition capabilities, enabling



Literature Review

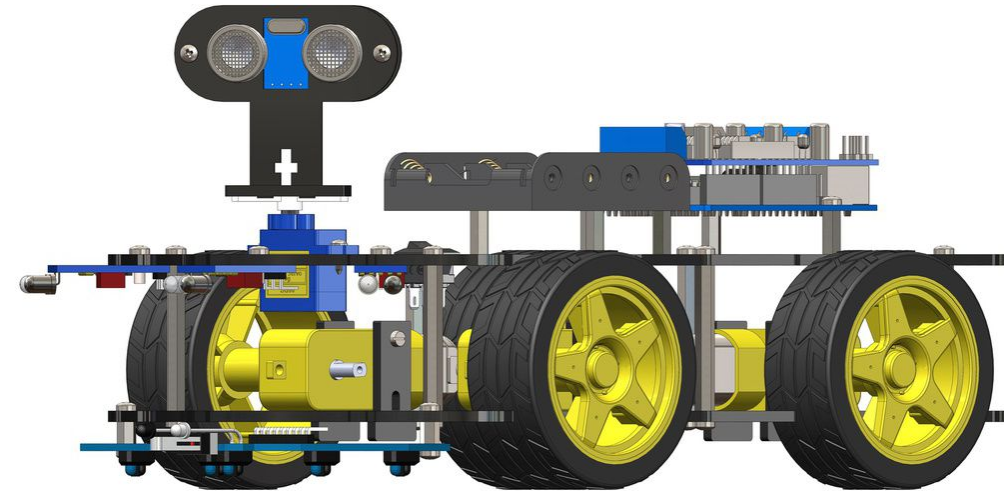


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AUTHORS	TITLE	JOURNAL/CONFERENCE NAME & YEAR	INFERENCE
Simaes MG, Franceschetti NN, Adamowski JC	A solar powered electric vehicle.	Resincap Journal of Science and Engineering, January 2020.	The car may be used more widely and is powered by green energy thanks to the usage of solar energy. The adoption of such a vehicle would significantly lower the amount of carbon dioxide that cars emit and lower the demand for oil.
Lavasani, M., Jin, X., & Du, Y.	Market penetration model for autonomous vehicles.	Institute of electrical and electronics engineers[ICSE] journal, April 2020.	
D., Simic, M., Khayyam, H., & Jazar, R.	Autodriver autonomous vehicles control strategy.	Microgrids Design and Implementation Journal, December 2019.	Here ultrasonic sensor are using in the wheel. This ultrasonic sensor detect curbs when other vehicles parking. With the help of ultrasonic sensor instruction send to the cars actuator. This actuator control acceleration, braking, steering.

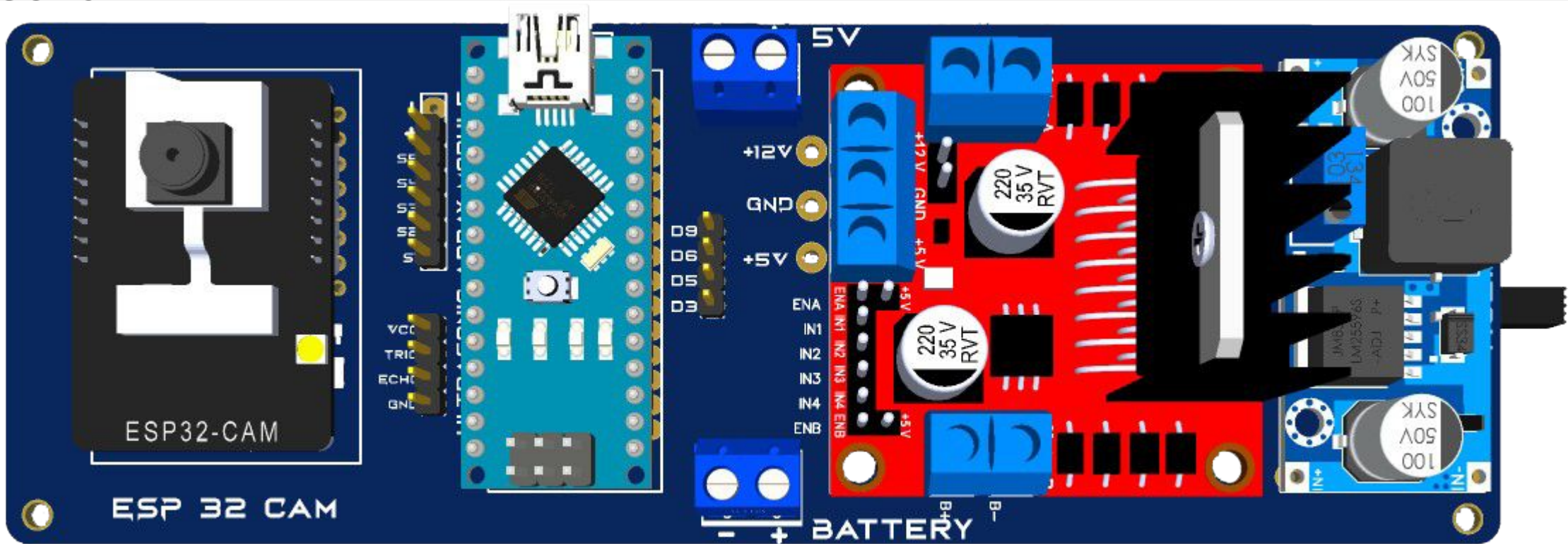
- This vehicle will work following the line follower
- This vehicle will also work through the navigation system
- Here we are using an obstacle detector sensor to see the surrounding obstacle to avoid various unwanted accidents.
- The power section plays a very important role in this Autonomous Vehicle. For this, we will use renewable energy as a charging system.
- As a renewable charging system here we will charge through PV Power and use the hybrid charging station



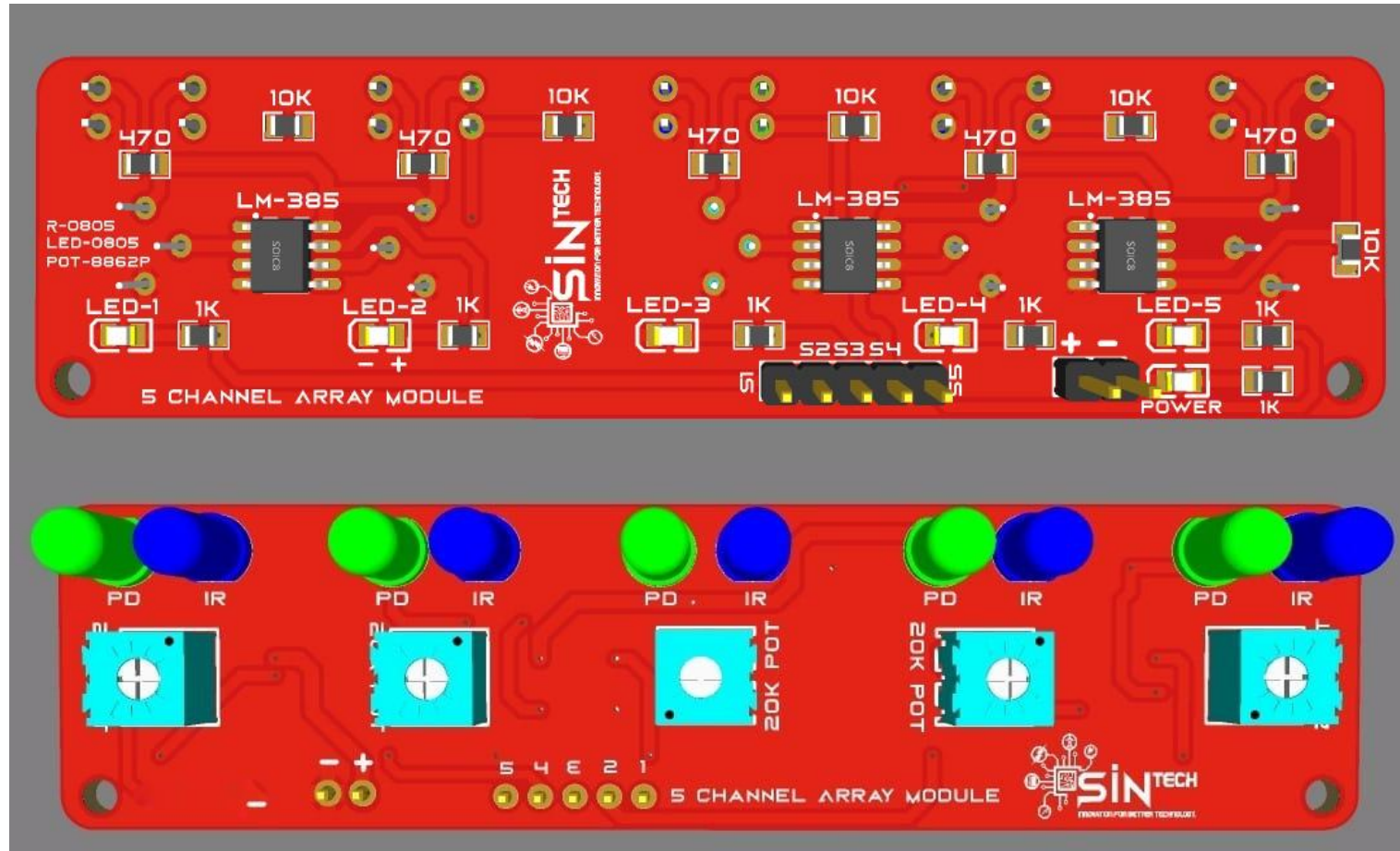
- ❑ The vehicle can autonomously patrol highways, using sensors and the camera to detect accidents, congestion, or disabled vehicles.
- ❑ In restricted areas like airports, industrial facilities, or high-security zones, the vehicle can autonomously patrol the perimeter.
- ❑ We can use this vehicle for creating better communication like campus facilities, and offices.
- ❑ Sensors and the camera can detect unauthorized personnel or suspicious activity, while facial recognition can help identify known threats..
- ❑ Law Enforcement Patrols can use the camera with facial recognition can identify individuals on a watchlist.
- ❑ Make transportation more affordable efficient.

Circuit

Board:



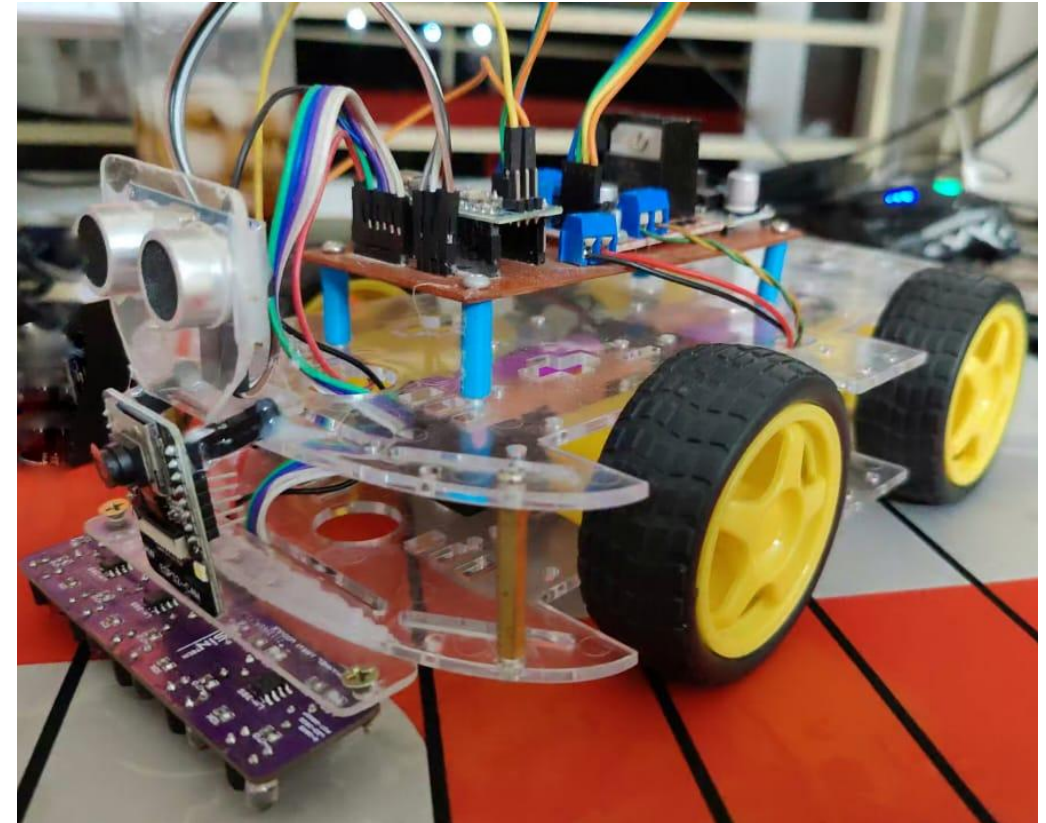
Sensor and Module: 5-Channel Array Module



Body and Chassis:

The frame and body is the main supporting structure of a motor vehicle. All other components are attached to this structure. The frame is also called the chassis. where all the machine part installation. This frame and body make up of a Acrylic sheets. Acrylic sheets are very thin and also lightweight Add its more durable than plastic.

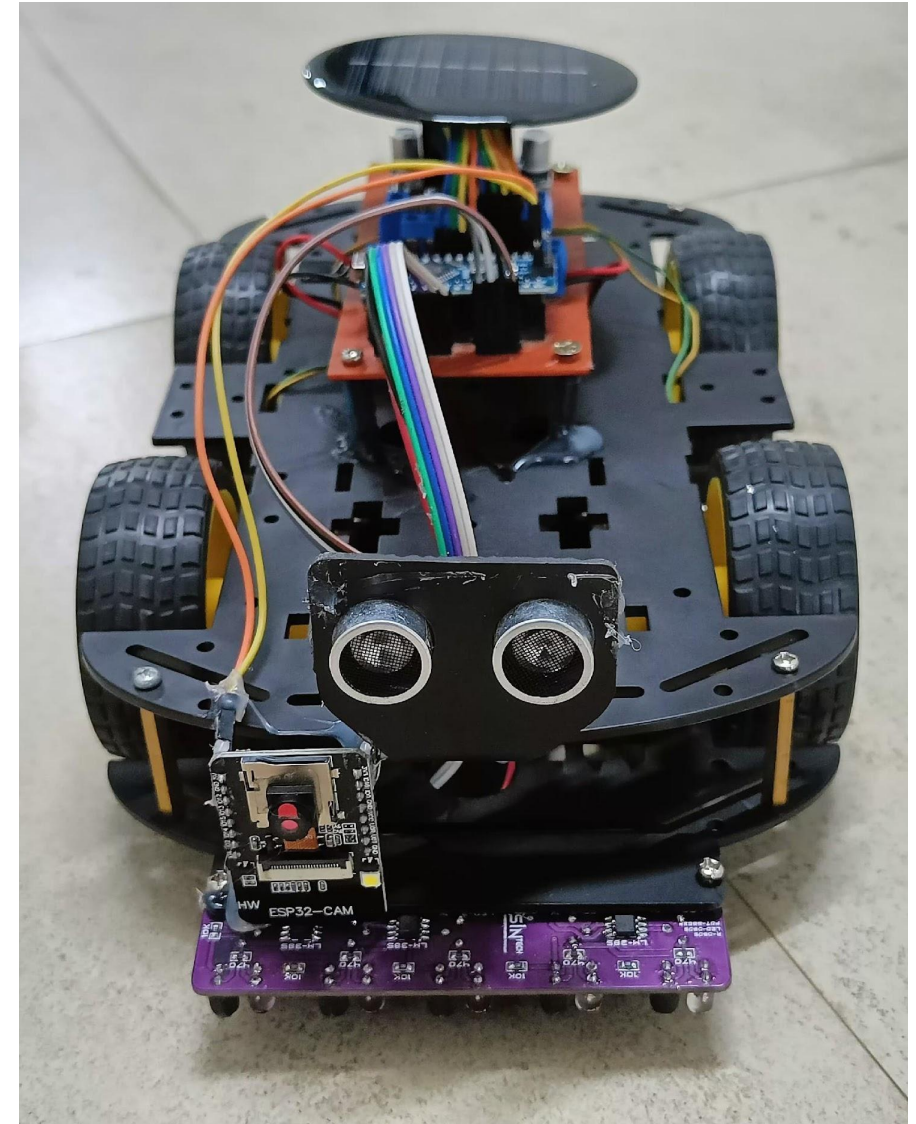
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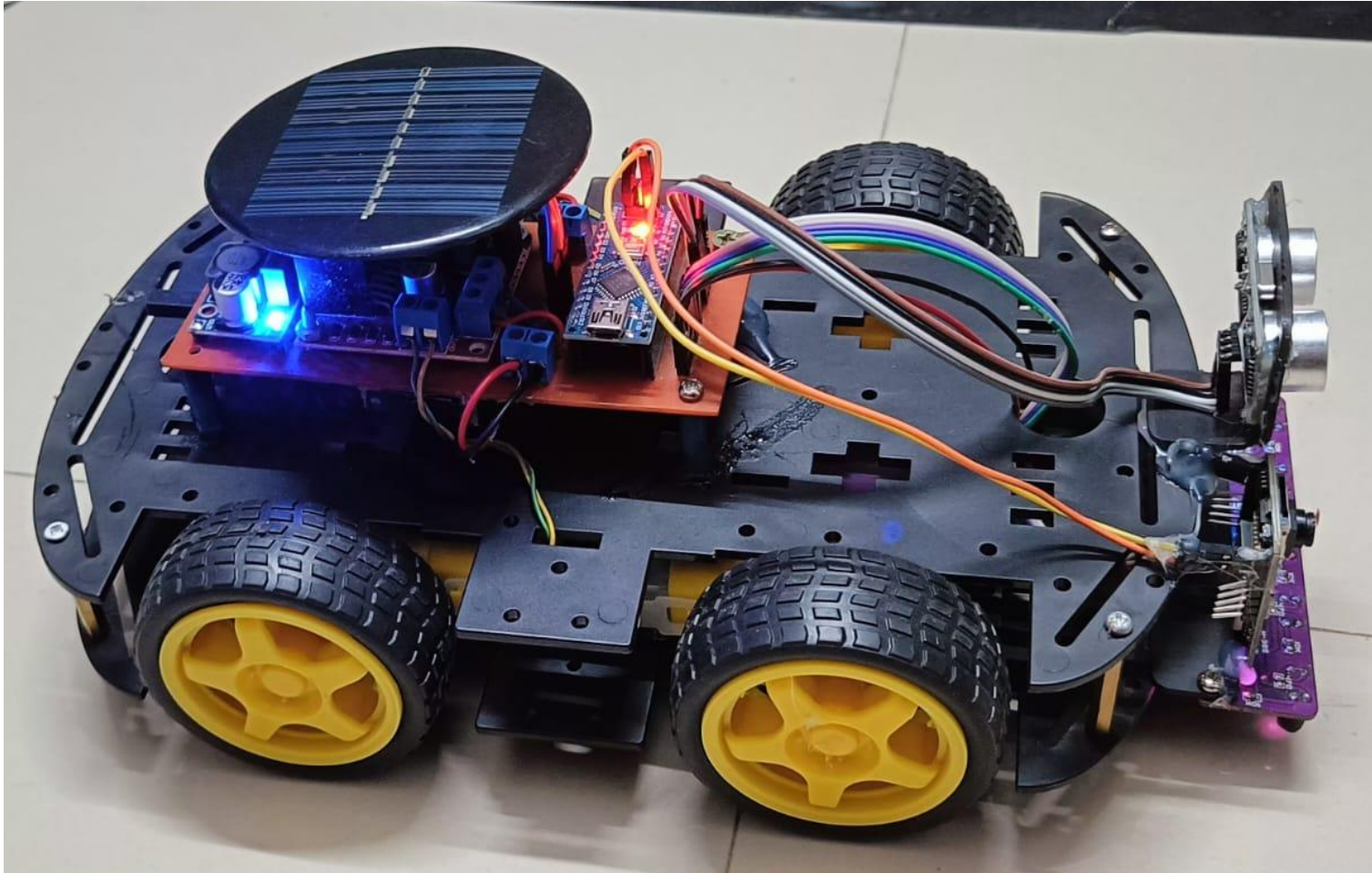
Front view of our Vehicle:

We are using several sensors in the vehicle, this sensor will control our vehicle via driving mode.

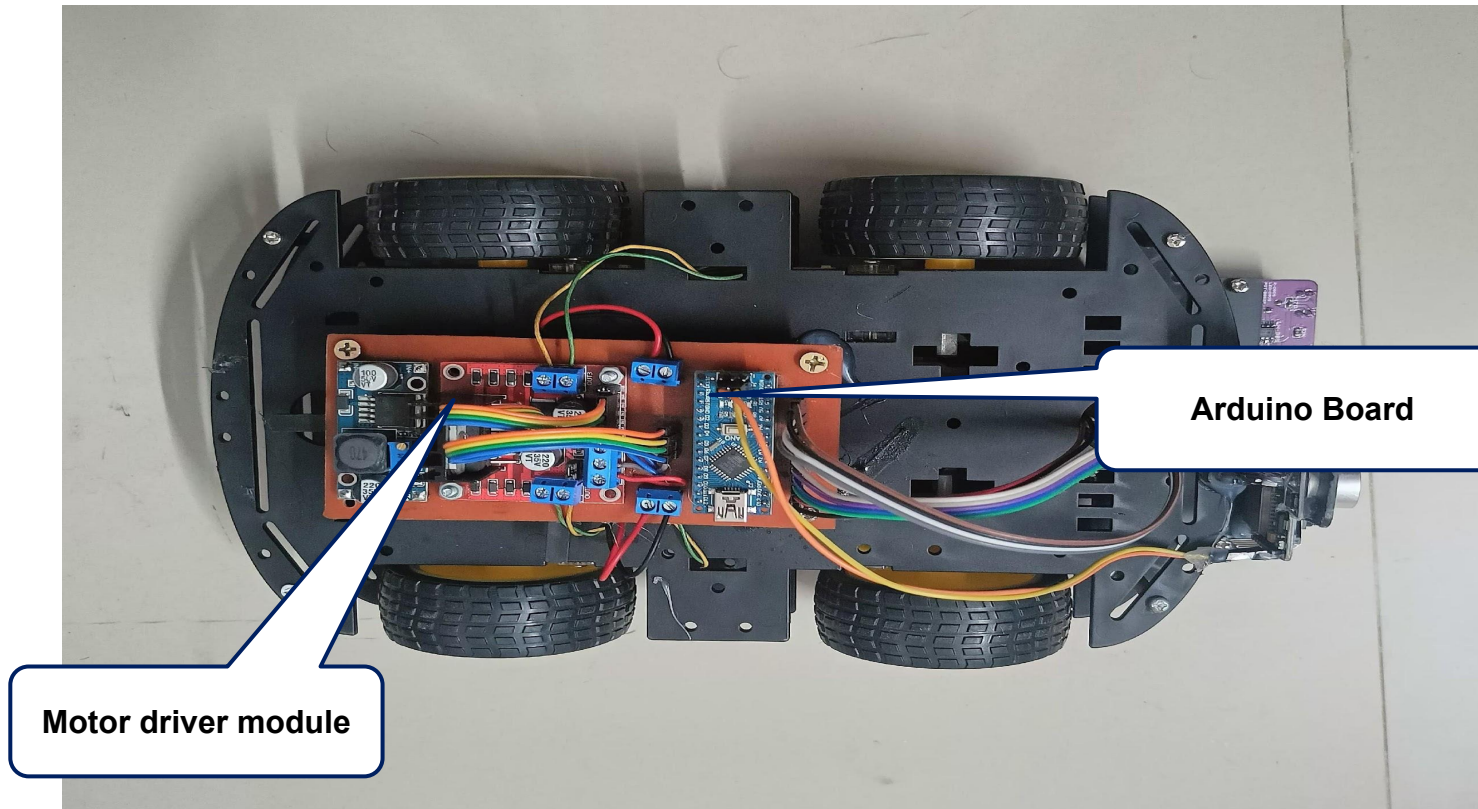
Here these sensor we are using is the ultrasonic sensor module, IR array module, IR sensor module.



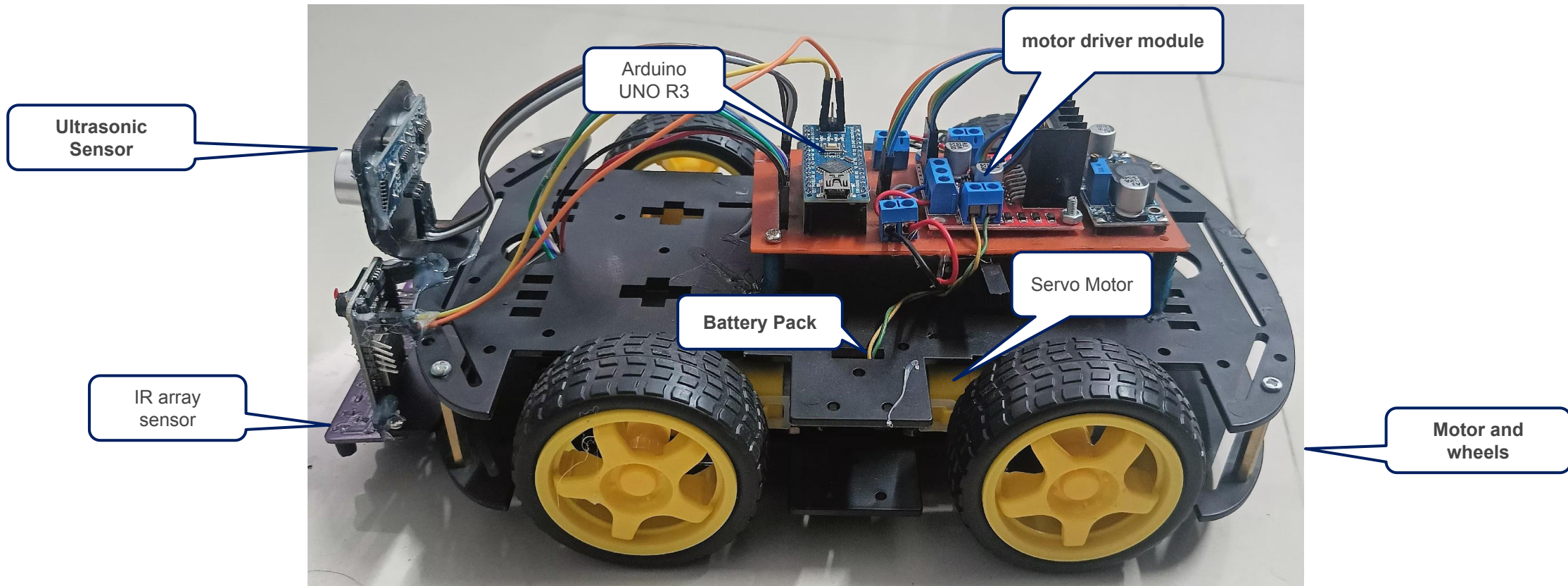
**Side view of our
Vehicle:**



Upper front view of our Vehicle:



All parts of our Vehicle:



Live Implementation

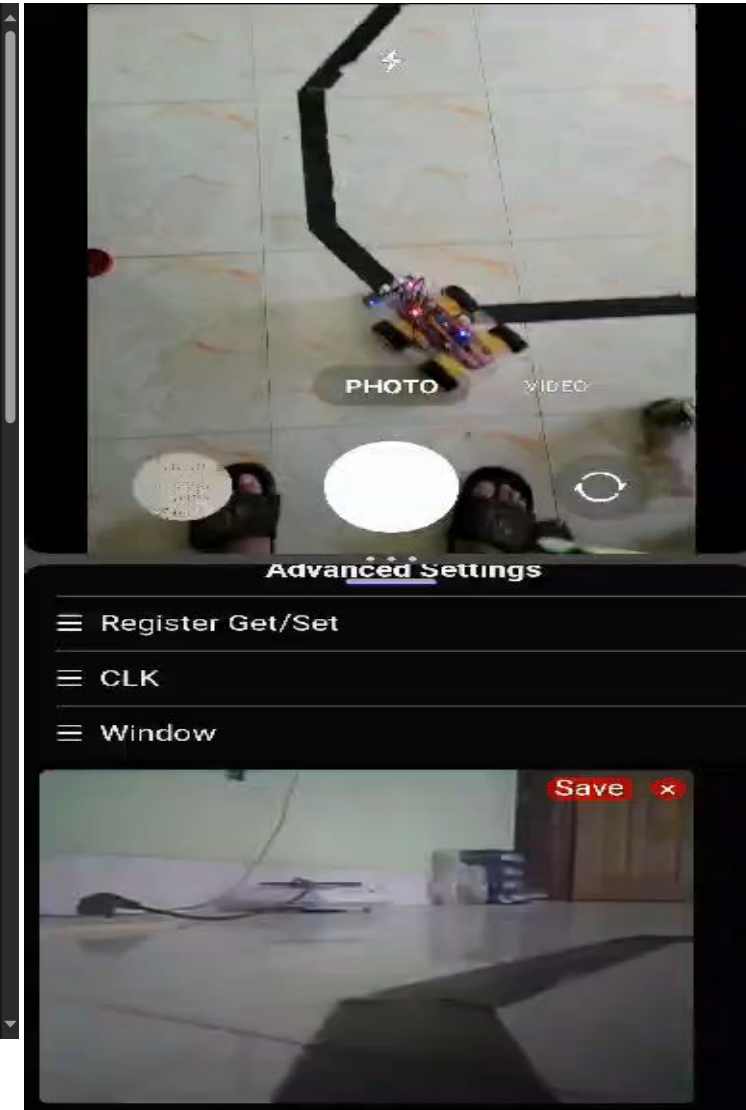


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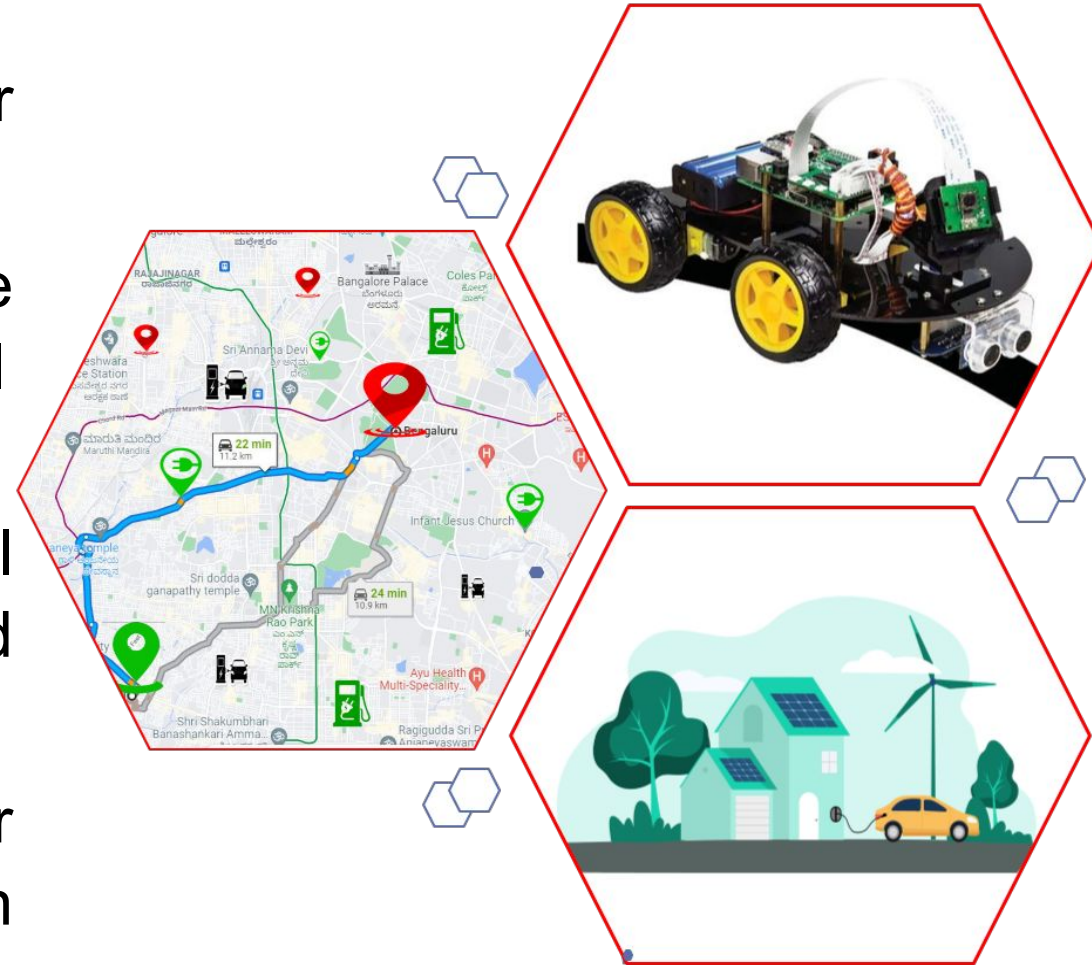
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Contrast	-2	2
Saturation	-2	2
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AWB Gain	<input checked="" type="checkbox"/>	
WB Mode	Auto	▼
AEC SENSOR	<input checked="" type="checkbox"/>	
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Firstly, we are making a body frame using a carbon fiber sheet with help of the CNC laser cutting method, Then we cut off the body frame with C.N.C laser cutting. For cutting this body frame we have to give an input signal to the CNC machine.

- **1st step:-** We make this design with the help of Auto-cad software. Here time duration is 4 days.
- **2nd step:-**With the help of Auto-cad design we will cut the body frame. Here time duration is 1 day.
- **3rd step:-**In the third step, we will join all of the small cutting parts for making the body frame. Here time duration is 2 days.
- **4th step:-**After done the body-making part we will add our all the necessary equipment to the body frame. This equipment is a circuit board, battery, motor and wheels, and sensors. Here time duration is 1 day.
- **5th step:-**After that we have to turn on the vehicles. For turning on the vehicles, We have to install a C-level program. Here time duration is **2 days**.
- **6th step:-**Finally here comes the testing session whether the vehicle is working or not. For that time duration is 2 days.

- ❑ This vehicle will work through a line follower and navigation system.
- ❑ The power section plays a very important role in this Autonomous Vehicle. For this, we will use renewable energy as a charging system.
- ❑ As a renewable charging system here we will charge through PV Power and use the hybrid charging station.
- ❑ An ESP32 camera can be used in a car for live video streaming with facial recognition capabilities



- Simaes MG, Franceschetti NN, Adamowski JC (1998) A solar powered electric vehicle.
- Morgan Stanley Research. (2018). Car of the future is shared, autonomous, electric.
- Lavasani, M., Jin, X., & Du, Y. (2016). Market penetration model for autonomous vehicles.:
- Quốc, D., Simic, M., Khayyam, H., & Jazar, R. (2018). Autodriver autonomous vehicles control strategy.



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Thank you