DIY PROJECT REPORT

SPRING SEMESTER 2023-2024

Object Tracking ROBOT

SECTION 20

GROUP 12

team

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MOTIVATION

motivation

We are making a object tracking and following vehicle which follows and moves in the direction of any object within its vicinity

we choose to make this project for our diy lab course depending upon various aspects

Choosing to make a human-following robot for a DIY project can be motivated by several factors:

Technicality

Building a robot capable of autonomously following any object presents a significant technical challenge. It involves integrating various technologies such as sensors, actuators, and algorithms for navigation and obstacle avoidance. For us, tackling this challenge is an exciting opportunity to push our technical skills and problem-solving abilities to the limit.

Practicality

A object-following robot has practical utility in various contexts, such as personal assistance, surveillance, or entertainment. By creating a DIY version, we are aiming to develop a solution to some specific needs and interests. For example, this robot might assist with tasks around the home or to serve as a companion on outdoor adventures.

Learning

DIY projects are valuable opportunities for hands-on learning and skill development. By undertaking the challenge of building a object-following robot, we can gain practical experience in robotics, electronics, programming, and other relevant disciplines. This experiential learning can be highly rewarding and serve as a foundation for our future projects.

Personal Fulfillment

Successfully completing a DIY project can bring a deep sense of satisfaction and accomplishment. It represents the culmination of hard work, perseverance, and creativity.

Choosing to make a object-following robot for a DIY project offers a compelling blend of technical challenge, practical utility, learning opportunities, creative expression. It's a project that can inspire and motivate individuals to explore the exciting world of robotics and make tangible contributions to the field

WORK METHODOLOGY

work methodology

defining project goals and requirements

we first designed the project on paper and discussed about how to implement it into reality what components do we need and how do we need to connect them

research and gathering resources

after we designed the project we moved on to do the research work what type of components we will be requiring and then got all those items issued from the lab store

detailed circuit design

once our kit was delivered we just started making the circuit on online sofware and tried to minimize the wiring part

prototype construction

finally once the online circuitry part was done we moved on to making the hardware connection and construction of the prototype that is our diy project body

software development

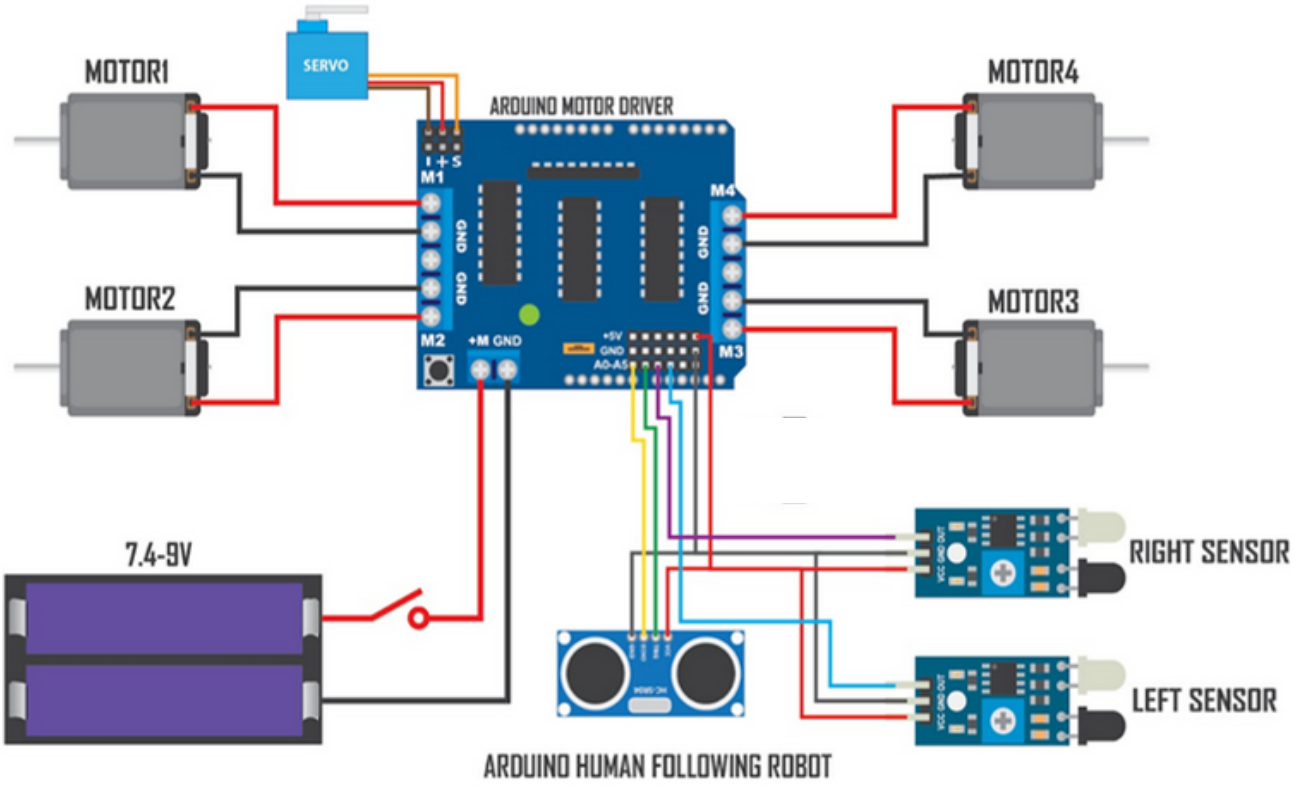
last part of our project was software development after doing all the necessary connection we wrote some lines of code and uploaded the code into the arduino controller

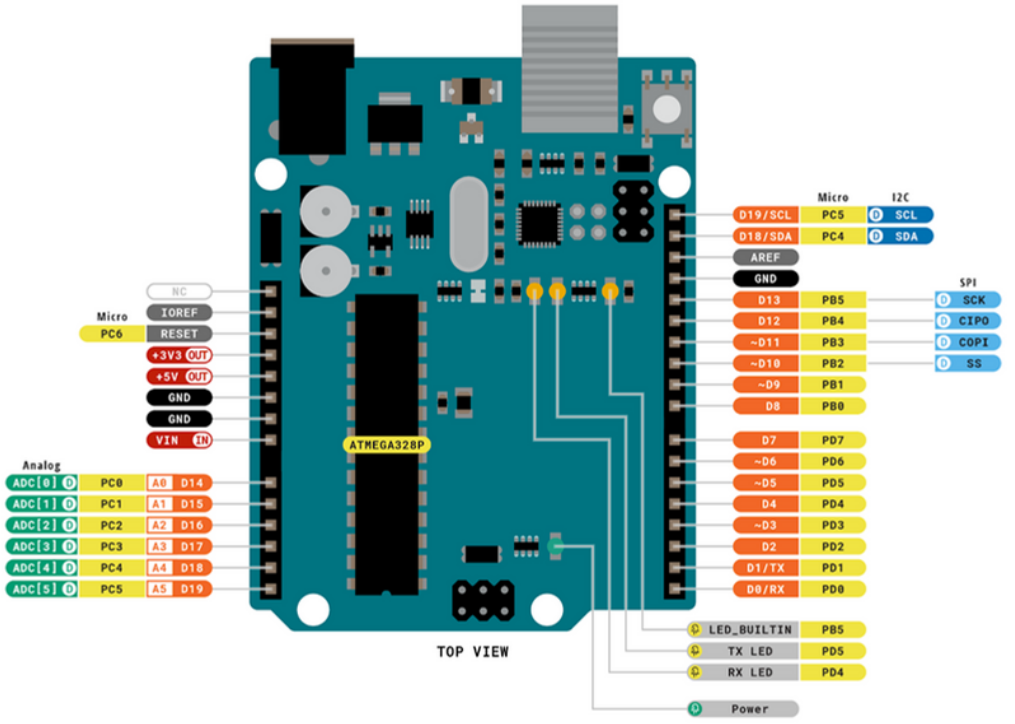
integration and final testing

after uploading the code we run our robot just to check whether all the systems were working properly and once were satisfied with our project we head towards submission

SCHEMATIC DIAGRAM

schematic diagram





LIST OF ITEMS

list of items

Arduino uno (1)
Motor driver shield (1)
tt gear motor (4)
Servo motor (1)
Ultrasonic sensor (1)
Infrared sensor (2)
18650 li-ion battery (4)
Battery holder (2)
Jumper wires (as per requirement)
Dc power switch (1)
Chasis kit(1)
Wheels (4)

SPECIFICATIONS

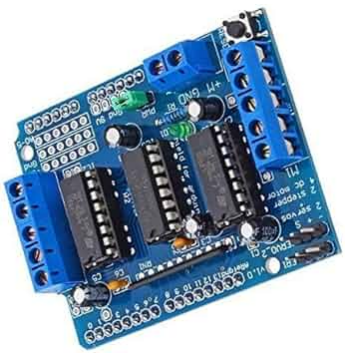
specifiactions

ARDUINO UNO

Arduino Uno is a popular microcontroller board that can be used to create various electronic projects, including Human Tracking Robot. In Human Tracking Robot it can be used as the main microcontroller to control various components such as motors, sensors like ultrasonic, infrared or camera modules to detect and track humans. The Uno can process sensor data, make decisions based on programmed
Algorithms, and control the robot's movement accordingly to track the human target.

MOTOR DRIVER SHIELD

The motor driver shield can be used in a human tracking robot to control the movement of motors efficiently. It enhances the capabilities of the Arduino Uno by providing robust motor control, which is essential for building an effective human tracking robot that can navigate its environment accurately and respond to changes in real-time.

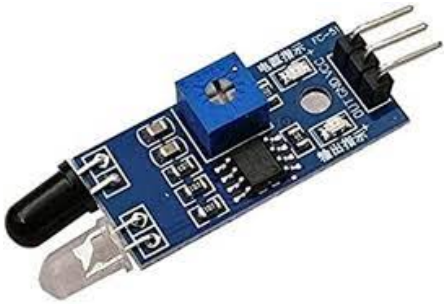


ULTRASONIC SENSOR

An ultrasonic sensor is a type of sensor commonly used in robotics and automation to detect the presence of objects or obstacles by emitting ultrasonic waves and measuring the time it takes for the waves to bounce back after hitting an object.

INFRARED SENSOR

Infrared (IR) sensors are devices that detect infrared radiation, which is emitted by all objects with a temperature above absolute zero. Infrared sensors typically consist of an IR emitter and an IR detector. The emitter emits infrared radiation, and the detector receives the radiation. When an object is present in the sensor's field of view, it either emits or reflects IR radiation. The detector senses the change in IR radiation intensity, allowing it to detect the presence of the object.



TT GEAR MOTOR

TT gear motors are popular choices for DIY projects and small-scale applications due to their compact size, affordability, ease of use, and versatility. They provide a convenient solution for adding motion and mechanical functionality to a wide range of projects.

SERVO MOTOR

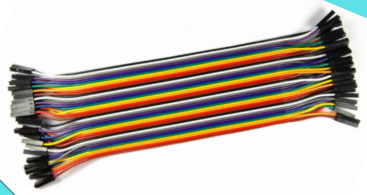
Servo motors operate based on feedback control. They consist of a motor, gearbox, and position sensor (typically a potentiometer or an encoder). The motor's shaft position is continuously monitored by the sensor, and any deviation from the desired position is corrected by adjusting the motor's speed and direction.

18650 LI-ION BATTERY

BATTERY HOLDER

CHASIS KIT

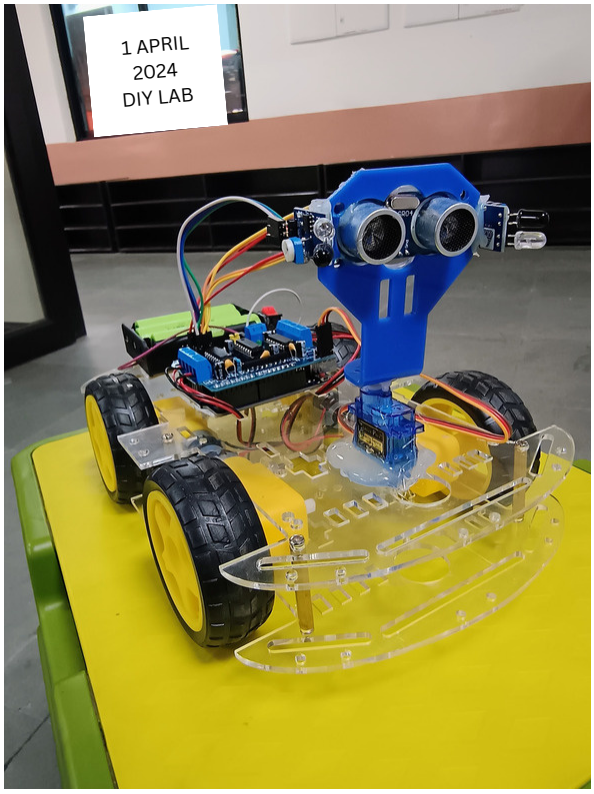
JUMPER WIRES

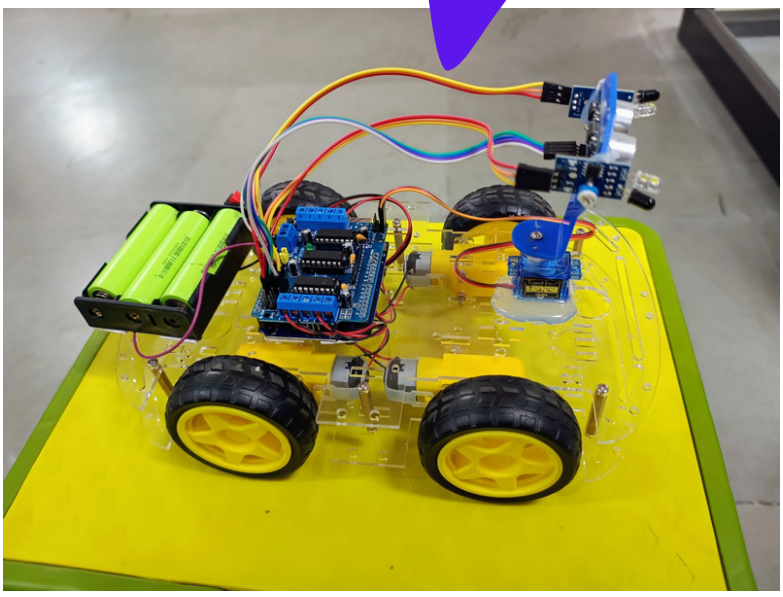


RESULT

result

FROM HERE TO HERE





CHALLENGES

challengee

during the development of this project we faced many challenges and we overcome such challenges with the help of our teachers and batchmates

the arduino which we got had some pieces not soldered on it and some terminals were also not soldered

with the help of soldering gun we soldered the components and the terminals to access them properly

at first our code was not working properly it was not being uploaded easily and after uploading it gave false results

we understood all the software complications through some videos then utilised that knowledge to upload the program

during begining we also faced some problems connecting the hardware parts properly

we diy sonme 3d parts and attached it in project

CONCLUSION

conclusion

after completing this diy project we learnt many things about computer robotics and automation we also get to learn about how various devices communicate each other and how to take them into use for our purpose

REFERENCES

references

youtube: to refer some video for help

google: refer to some websites to arrange for various resources

tinkercad: build the circuit online

arduino IDE: writing and development of code