***Pertinent Information Gathering Document***

Need Statement : Object Tracking Bot .

Team no. :- 16

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| **LIST OF EXISTING PROJECTS** | **LIST OF COMPONENTS USED** | **MECHANISM** | **REFERENCES** |
| 1) Colour detection bot | * Arduino Mega * TCS3200 (RGB + Clear) colour Sensor Module. * Breadboard (Prototyping board) * Power supply. | Colour sensors are developed based on diffuse technology that can detect a wide range of colours. The combination of colour sensitive filters and sensors array perform colour sensing, which is further used to analyse the colour present in an image or in a specified object. The colour measurement process involves a light source to illuminate the surface, the target surface, and a receiver that measures the reflected wavelengths. A white light emitter is used to illuminate the surface. The sensor then activates three filters with three wavelength sensitivities to measure the wavelengths of RGB colours respectively. Based on these three colours, the colour of the determined. | <https://neptune.ai/blog/15-computer-visions-projects>  [https://www.bestech.com.au/blogs/understanding-colour-sensors-working-principle-and-applications/ - :~:text=A%20white%20light%20emitter%20is,of%20the%20material%20is%20determined.](https://www.bestech.com.au/blogs/understanding-colour-sensors-working-principle-and-applications/#:~:text=A%20white%20light%20emitter%20is,of%20the%20material%20is%20determined.) |
| 2) Face Recognition  Bot | * Arduino Uno * Power source * Standard servos * USB camera * Breadboard * 9V Battery * Servo motor * System chassis * USB webcam | Face detection software detects faces by identifying facial features in a photo or video using machine learning algorithms. It first looks for an eye, and from there it identifies other facial features. It then compares these features to training data to confirm it has detected a face. | <https://neptune.ai/blog/15-computer-visions-projects>  <https://www.pantechsolutions.net/face-tracking-robot-using-arduino>  [https://www.researchgate.net/publication/372955685\_Arduino\_Based\_Real-Time\_Face\_Recognition\_And\_Tracking\_System - :~:text=tracking%20the%20human's%20face%20using%20a%20webcam%2Dbased%20system.&text=webcam%2C%20two%20servo%20motors%20to,the%20webcam%2C%20and%20a%20PC.&text=Integrated%20Development%20Environment%20(IDE).&text=the%20Arduino%20and%20the%20servo%20motors%20with%20the%20needed%20voltage.](https://www.researchgate.net/publication/372955685_Arduino_Based_Real-Time_Face_Recognition_And_Tracking_System#:~:text=tracking%20the%20human's%20face%20using%20a%20webcam%2Dbased%20system.&text=webcam%2C%20two%20servo%20motors%20to,the%20webcam%2C%20and%20a%20PC.&text=Integrated%20Development%20Environment%20(IDE).&text=the%20Arduino%20and%20the%20servo%20motors%20with%20the%20needed%20voltage.) |
| 3) Hand gesture recognition Bot | * transmitter receiver * IC-encoder * 3 axis memes * Arduino * USB Webcam * 9 v Battery * servo motors | The hand gesture control system utilizes sensors like accelerometers to interpret hand movements .  The sensor data is read by the Arduino through its input pins . | <https://ijarsct.co.in/Paper14072.pdf>  <https://neptune.ai/blog/15-computer-visions-projects> |
| 4)Road lane detection in autonomous vehicles | * Raspberry Pi + Arduino * Camera * two ultrasonic sensors * Power units * 4 DC Motors . | Autonomous cars rely on sensors , actuators , algorithms and machine learning systems to execute softwares . | <https://www.synopsys.com/automotive/what-is-autonomous-car.html#:~:text=could%20go%20anywhere.-,How%20Do%20Autonomous%20Cars%20Work%3F,different%20parts%20of%20the%20vehicle>.  <https://neptune.ai/blog/15-computer-visions-projects> |
| 5 )Object avoidance bot | * Arduino board * Motors controller * Distance sensor * Bluetooth module * USB Webcam * Bread Board | The working principle of the robot is transmitting a sensed  signal to the microcontroller to control the DC motors for obstacle avoidance. The H-bridge L293D controls the direction of the motors to move either clockwise or anti-clockwise directions as provided by the microcontroller. | <https://blog.miguelgrinberg.com/post/building-an-arduino-robot-part-i-hardware-components>  <https://iopscience.iop.org/article/10.1088/1757-899X/152/1/012064/pdf#:~:text=The%20working%20principle%20of%20the,as%20provided%20by%20the%20microcontroller>  . |
| 6 ) Light following flower bot | * Arduino * Breadboard * servo motors * photo resistance * 1000 ohm resistors * 100 micro farad capacitors * jumper wires * 9 V battery | The project compares the values of two light sensors to figure out where the light is , then turns the servo motor to rotate the flower towards the light . | <https://www.instructables.com/Create-an-Arduino-Controlled-Light-Following-Flowe/> |
| 7 ) Fake currency detector bot | * Arduino * Breadboard * UV LED * Photo diode * amplifier * Comparator | The UV LED source transmits the UV rays, if the note is real it will absorb some amount of UV rays and if the note is fake then all rays will be reflected back towards the photodiode. | <https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3275068_code3203778.pdf?abstractid=3275068#:~:text=Fake%20note%20detection%20unit%20consist,reflected%20back%20towards%20the%20photodiode>. |
| 8 )Edge and Contour Detection Bot | * Arduino Uno. * IR sensor. * DC Motors. * Wheels. * Chassis. * Jumper wires. | When any sensor detects the edge the robot will turn according to the sensor direction. If there is no edge the robot will move forward continuously. | <https://techatronic.com/edge-detection-robot-smart-robot-arduino-robot/> |
| 9 ) Motion Detection System Bot | * Arduino * PIR Sensor * Buzzer * Arduino cables * Rated power supply. | The PIR sensor detects the motion and sends the digital value to the Arduino and Arduino sends the signal to the Serial Monitor and the buzzer will be started. otherwise, it will be off. | <https://www.geeksforgeeks.org/how-to-make-motion-detection-system-using-arduino/> |
| 10 ) Vehicle traffic Volume counter bot | * Arduino uno * Ultrasonic sensor * SD card module * SD card * power supply (rated) | After all the setup, the vehicle must be allowed to pass from the model. When a vehicle is passed through the two sensors the distance from vehicle to the sensor is calculated. Once the vehicle is classified the counting of vehicle is done and it is saved in SD card. | <https://theconstructor.org/transportation/vehicle-traffic-volume-counting-using-arduino-uno/20528/> |