

WALCHAND COLLEGE OF ENGINEERING, SANGLI

(An Autonomous Institute)



Department of Electronics Engineering

Mini Project-4 Synopsis

“Hand Gesture Control Robot”

Class:

T. Y. ELECTRONICS A. Y. 2022-23

Batch:

EN3 GROUP 2

Submitted by

Sr No	PRN	Name	Email Id
1	2020BTEEN00036	Sushant Anil Todkar	sushant.todkar@walchandsangli.ac.in
2	2020BTEEN00045	Siddheshwar Sugriv Ghuge	siddheshwar.ghuge@walchandsangli.ac.in
3	2020BTEEN00050	Shruti Rajesh Jawalkar	shruti.jawalkar@walchandsangli.ac.in

Under the guidance of

Prof. S.G. Tamhankar

INTRODUCTION:

Today the world is changing drastically. Every simplest work is now being improved for optimised and efficient approach. Strong efforts have been carried out to develop intelligent and natural interface between users and computer-based systems based on human gestures. Robots are playing an essential role in automation across all sectors like construction, military, medical, manufacturing, etc. An important aspect of Robotic System is Human Machine Interaction.

In the early years, it was difficult to communicate with robots but with the development of science and technology, Gesture based automation came into life. Hand Gesture controlled robot moves according to hand movement as we place the transmitter in our hand. The main attraction of this robot is Arduino and Bluetooth module. This system can be used in Healthcare, Consumer Electronics, Virtual Reality, Military and lots more.

LITERATURE SURVEY:

1. **"Gesture Control Robot"** by Namira Khan and Sharmin Siddiqui

The foremost goal of the project work is to govern robotic with gestures the use of hand. The accelerometer relies upon up on the gestures of the hand. Through accelerometer, a passage of statistics sign is acquired and it's far processed with the help of arduino microcontroller

2. **"Hand Gesture Controlled Robot Using Arduino"** by Suryarajsinh T. Vala

Now-a-days, as a result of the advancements in technology, human-machine interaction is widely increasing that reduces the gap between machines and humans for easy standard of living. This paper describes regarding how the conventional hand gestures can control a robot and perform our desired tasks.

3. **"Wireless Gesture Controlled Robot using Arduino and Bluetooth Module"** by A. B. M. H. Rashid et al. (2017)

This paper describes a wireless gesture-controlled robot using Arduino and Bluetooth. The authors use an accelerometer and a gyroscope to detect hand movements, and transmit the data via Bluetooth to the robot for control.

OBJECTIVE:

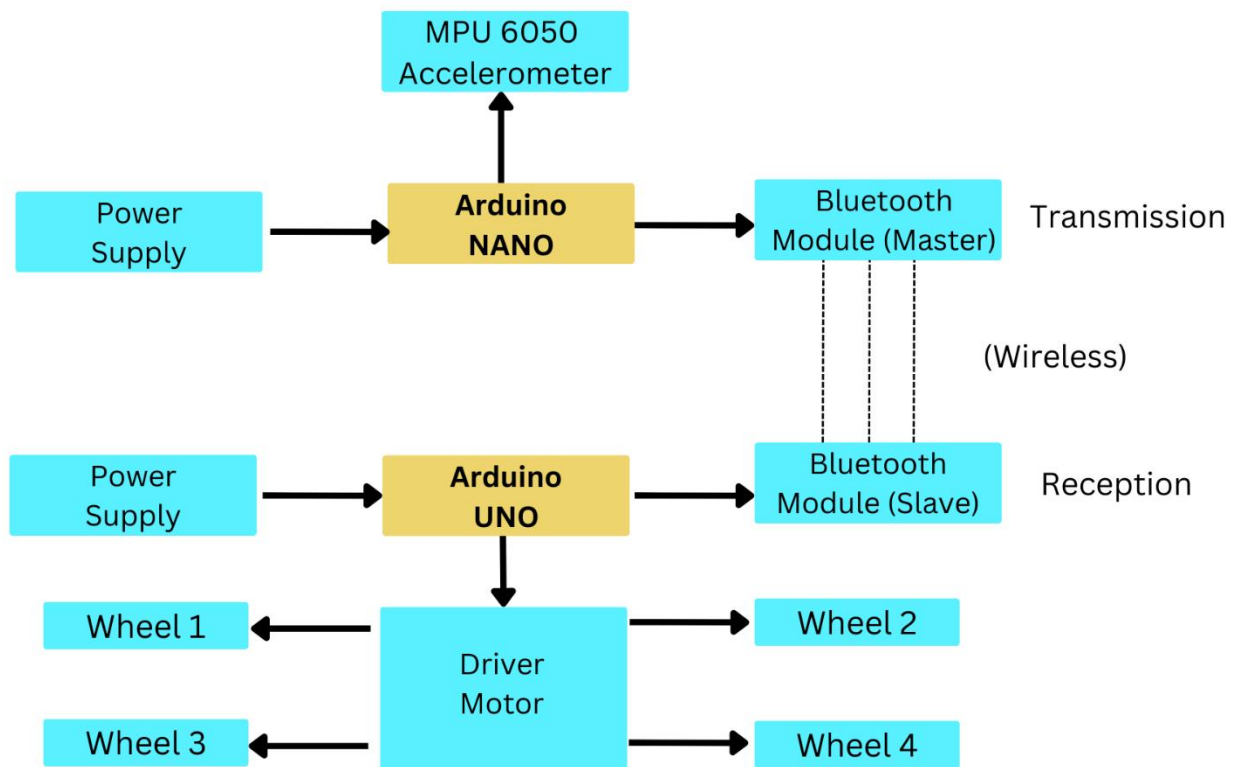
1. Establish a wireless communication channel between the hand gesture recognition system and the robot using Bluetooth.
2. Demonstrating the potential of combining low-cost microcontrollers like Arduino with wireless communication technologies like Bluetooth to create innovative and practical applications.
3. Developing a reliable and accurate hand gesture recognition algorithm to ensure that the robot responds appropriately to the user's commands.
4. Developing a low-cost, user-friendly way to control a robot using hand gestures instead of traditional input devices like joysticks or keyboards.
5. Improving accessibility for users with physical disabilities who may have difficulty using traditional input devices.

PROPOSED WORK:

1. The whole project is divided into two sections one is transmitter section and other is receiver section. The brain of the robot is an Arduino Uno.
2. The gestures/motion made by hand is recognized by the acceleration measuring device called accelerometer.
3. With the help of a Bluetooth module: Master and Slave, The signals are transmitted and received.
4. A driver motor will be used for accelerating four wheels and changing directions accordingly.
5. Arduino Uno and Arduino Nano will have desired code one for detecting gestures and driving robot and other for giving signals of gestures'

METHODOLOGY:

BLOCK DIAGRAM:



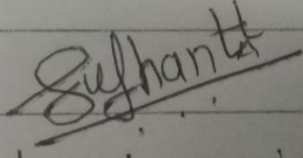
EXPECTED OUTCOMES:

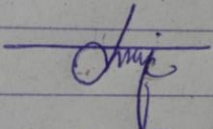
1. **Improved Accessibility:** One of the key benefit of using hand gesture control in robot is that it can improve accessibility for individuals with physical disability.
2. **Enhanced user experience:** Using hand gestures to control a robot can provide a more immersive and interactive user experience.
3. **Learning and Education:** Building and programming a hand gesture control robot can be a great way to learn about robotics and programming. It can also be a fun educational tool for children and students.
4. **Research and Development:** Hand gesture control robots can be used for research and development purposes, such as studying human-robot interaction or testing new control algorithms.
5. **Increased mobility:** Hand gesture control allows users to control the robot from a distance, which can increase the robot's mobility and versatility. This can be especially useful in environments where physical access is limited, such as in hazardous or remote locations.

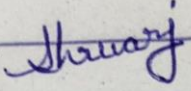
REFERENCE:

1. "Hand Gesture Controlled Robot using Arduino and MPU6050 Gyroscope Accelerometer" by J.S. Kumar and P. Vinayakumar, International Journal of Engineering Research & Technology (IJERT), vol. 6, no. 2, pp. 148-152, 2017.
2. "Hand Gesture Recognition-Based Wireless Robot Control Using Arduino" by R. K. Sahoo, P. Kumar, and S. K. Mahapatra, International Journal of Control Theory and Applications, vol. 10, no. 43, pp. 277-284, 2017.
3. "Real-Time Hand Gesture Recognition for Controlling a Robot Using Arduino" by M. G. Nadeem and N. M. Khan, International Journal of Computer Applications, vol. 179, no. 11, pp. 31-36, 2018.
4. "Design and Implementation of a Hand Gesture Controlled Robot Using Arduino and MEMS Sensors" by A. M. Hassan, A. M. Al-Riyami, and S. S. Sultana, International Journal of Advanced Computer Science and Applications, vol. 10, no. 11, pp. 33-37, 2019.

SUBMITTED BY:


sushant Anil Todkar


Siddheshwar Sugriv Ghuge


Shrutij Rajesh Jawalkar