

Gesture Control Robot¹Ayushi Jain, ²Nishtha Goel, ³Sachi RaiEmail: ¹ayushijain5368@gmail.com, ²nishthagoel4sep@gmail.com, ³sachirai95@gmail.com**Abstract**

A robot is a mechanical or virtual intelligent agent that can automatically perform the tasks or with the guide, enter with the remote control. In practice a robot is usually an electromechanical machine that is guided by computer and electronic programming. Gesture Recognition technology has many advantages over other human computer interface technology [1]. In this work, we have a technology development as “the sixth sense” technology or 6G technology. This technique is useful for the control of robots with MATLAB program.

Keywords: MAX232, L293d, Gesture, MATLAB.

1. Introduction

The main reason of this research is to make robot to achieve human gesture, so that the gap between robots and humans bridge. Human gesture improves the interaction human-robot, is to make it independent of the input devices. Robot system can be manually or can autonomously control. Hand robot can be controlled remotely with the hand gesture. Research in this area has taken place, the detection of the movements of the hand and the control of the robot arm has been developed. Color-based technology is well recognized for the hand gesture. To properly grasp gesture, the right lighting and camera angle and good quality camera is required. The problem of (gesture) recognition and visual monitoring is very demanding [2]. Previously used many approaches to position marks are based, but they were not effective, Because of their inconvenience, which are not used for the control of the robot we have proposed automatic gesture recognition with MATLAB (image processing). Once a gesture is detected, a control signal is generated and sent to the microcontroller. Already a program for signal acquisition is burned on the microcontroller. Once the control signal is received by the robot operates in accordance with the predefined function unless new signal is resumed.

2. Project work

To overcome the limitations of the current system, we have developed a project based robot control commands given by gestures. In this proposed system, a green strip in front of the camera is placed. The robot controllers are the gestures that are captured by the camera. Then the gestures by using image processing algorithms recognized in the appropriate commands to the robot to convert. The instructions are then given to the robot and the robot will perform accordingly. Thus, with this technique, the boundary exceeds by a remote control or a joystick, which. The efficiency of the robot when the distance to improve, in which a joystick or communicates with distance is limited Using this technique, in which the distance we can communicate it can be improved in a range between 5-6 Km [3].

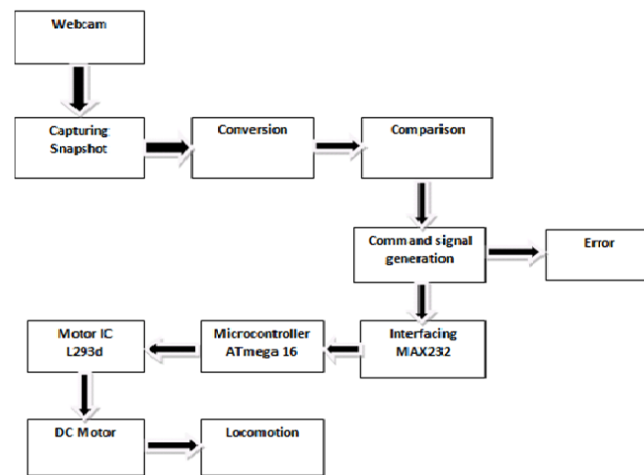


Figure 1: Schematic representation of the project modules

3. Hardware

ATmega 16 AT referring to Atmel, while Mega Mega AVR microcontroller category represented include 16 means controller memory. Atmega16 is equipped with an internal oscillator to the clock and its standard is set for driving with calibrated internal oscillator of 1 MHz with a maximum frequency of 8 MHz to operate. ATmega16 can be operated via an external crystal oscillator with a maximum frequency of 16 MHz (that we need to change the fuse bits). Atmega16 is an 8 -channel ADC (analog - digital converter) with a resolution of 10 bits. It consists of two 8 - bit and 16-bit timer / counter. Universal synchronous and asynchronous receiver and transmitter interface for interfacing with external devices may be provided to communicate serially (bit -by- bit transmission of data)[2].

Dual H - bridge motor driver IC L293D motor is essentially a power amplifier that receives a low power signal from the microcontroller and sends high-current signal can control, and a motor drive. Turns a motor and run it in one direction, a switch is sufficient, but if we want to change the direction of what we have to change the polarity. Bridge circuit - this can be performed using H. Turning of the switches A, B, C and D, the motor can be operated in any direction. L293D IC is a 16 -pin DIP. This driver can -IC in both directions simultaneously controls two small motors, forward and backward with only 4 Microcontroller Pins[5].

MAX 232 IC: - MAX232 IC interfacing is used to convert the logic level TTL / CMOS logic levels RS232, while the serial communication microcontroller and the PC is initialized. The controller works with TTL logic level (0-5 V), while the serial communication is working on the RS232 standard (-25 V to + 25V). This leads to difficulties in establishing a direct connection between the microcontroller and PC. Therefore, interconnection is provided by MAX232 available. It is a driver / dual receiver. Receiver (R1 and R2) can accept inputs $\pm 30V$. The driver (T1 and T2), also called channels, received TTL / CMOS input levels in the RS232 level. The channels take input from pin send serial transmission of the microcontroller and output to the receiver RS232. The receiver takes the input of the transmission pin RS232 serial port and serial port to the receiver to the microcontroller pin. MAX232 requires four external capacitors, which varies from 1 F to 22 μ F value [4].

4. Software

MATALB stands for Matrix Laboratory. Hence, as the name suggests, here we play around with matrices .MATLAB is a high-level language .It was originally designed for solving linear algebra type problems using matrices. It provides an interactive environment for

- Numerical Computation
- Visualization
- Programming

MATLAB is widely used as a computational tool in science and engineering encompassing the fields of physics, chemistry, math and all engineering streams. It is used in a range of applications including[1]:

- Numerical Computation
- Data Processing
- Image processing
- Programming
- GUI (Graphical user Interface)
- Design Games
- System modeling and Simulation

5. Conclusion

We have proposed a fast and easy algorithm for recognizing gestures to control the robot. We have demonstrated the effectiveness of this efficient computational algorithm shown on real images that we have acquired. In our gesture-controlled robot system we have considered only a limited number of gestures. Our algorithm can be extended in a number of ways to detect a wider range of gestures. The gesture recognition part of our algorithm is too simple and would have to be improved if this technique should be used in severe operating conditions. Reliable performance of the gesture recognition techniques in a general context requires, with blockages that term monitoring for detection of dynamic gestures, and 3D modeling that have largely to do about the current state of the art.

In this work we have developed a technology, known as the "sixth sense" to develop technology, or 6G technology. This technique is useful for the control of the robot, the MATLAB program. In the future we will try to improve this technique.

6. Reference

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