HAND GESTURE CONTROLLED PICK AND PLACE ROBOT

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ABSTRACT

Today human-machine interaction is moving away from keypad and is becoming pervasive and much more compatible with the physical world. With each passing day the gap between machines and humans is being reduced with the introduction of new technologies to ease the standard of living.

Gestures have played a vital role in diminishing this abyss. The main purpose of using gestures is that it provides a more natural way of controlling and provides a rich and intuitive form of interaction with the robotic system. This mainly involves Image Processing and Machine Learning for the system or application development. Beyond this, it also requires some kind of hardware for interfacing with the system for gesture control. There are some systems that have been developed in the same field using various techniques.

Keywords: ***MATLAB, Embedded***

I. INTRODUCTION

In this system we can navigate the wireless robot in the environment using various gestures commands. In this system, we operate the robot from a control station that can be a laptop or a PC with a good quality in-built webcam or external webcam. This webcam is used to capture real time photos of hand gestures to generate commands for the robot. Image frame is taken as an input and processed using Digital Image Processing. Processed image is then used to extract the gesture command.

Robot is moved in all possible directions in the environment using six possible types of commands which are Forward, Backward, Right, Left and arm movements. Image frame is taken as an input and processed using Image Processing. Processed image is then used to extract the gesture command. This gesture command can have one of the six possible commands as specified

II. EXISTING SYSTEM

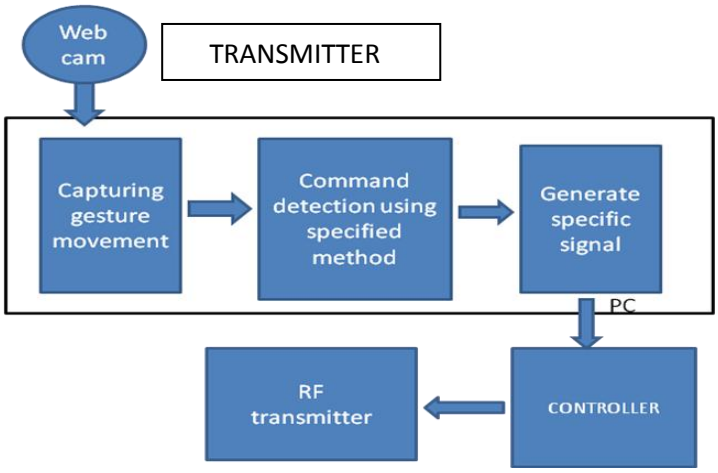
Many systems exist that are used for controlling the robot through gestures. Some gesture recognition systems involve, adaptive colour segmentation , hand finding and labelling with blocking, morphological filtering, and then gesture actions are found by template matching and skeletonising. This does not provide dynamicity for the gesture inputs due to template matching. Another system uses machine interface device to provide real-time gestures to the robot. Analog flex sensors are used on the hand glove to measure the finger bending , also hand position and orientation are measured by ultrasonics for gesture recognition .

The emergence of service robots in early 90's followed by the development of Natural language interface through keyboard has been given by Torrance in 1994.

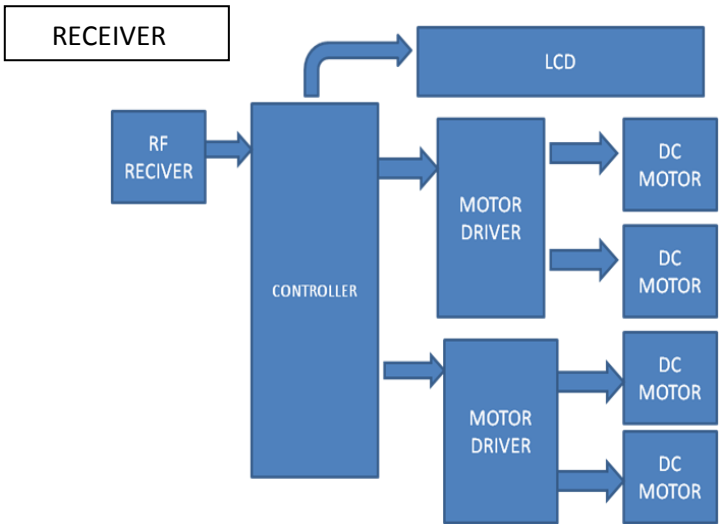
In 2008, Chinese traffic police system used two 3-axis accelerometers fixed on the back of their arms that were synchronized with traffic lights. In 2010, Sauvik Das et al have used an accelerometer as a potential spying device to show locations and activities of user without one's knowledge. One of the limitations was that inbuilt accelerometer Smartphone would have to be in the same place as was in the training mode to make accurate predictions.

In 2010, Smartphone's were used to control Universal Robot Control System by the students of Kyungpook National University, Korea, to design a real time robot control system in ubiquitous environment. Researcher's proposed vision-based interface that included gesture recognition through camera to provide geometrical information to the robots. They developed mobile robot systems that were instructed through arm position.

III. PROPOSED SYSTEM



There are mainly 4 blocks in Hand gesture controlled pick and place robot transmitter side .An image frame is taken as input through webcam. The image frame is then processed using MATLAB. An image frame is then compared with pre stored image frames. If the captured image frame matches with pre stored image frame then corresponding hexadecimal data is send through RF transmitter. MATLAB and is heart of transmitter side.



Receiver side consist of 5 blocks-RF receiver ,controller, motor driver, LCD, motor. Hexadecimal data transmitted at transmitting section is received at the RF receiver .ATMEGA 328 controller is used to process

received data .Based on the received data the controller sends suitable signal to motor driver. L293D motor driver IC is used to drive motor .ATMEGA 328 is the heart of the receiving section which control the motion of the robot .

IV. FEATURES

4.1 Real time system

The robot operates in real time. As soon as hand gesture is changed the robot respond in real time .

4.2 High Speed

The system operates very fast. Controller has frequency about 2Mhz. And hence high speed.

4.3 Low Operating Power, Easy to Implement

ATMEGA328 requires low power and easy to implement so system is yery simple.

V. APPLICATIONS

Here we are developing the pick and place robot farther we will develop a robot which can be used for

5.1 Military Purpose

In military we can use this type of robot to avoid human life risk.

5.2 Domestic Purpose

This robot can do repeated work without any mistake.

5.3 Industrial Purpose

High skill work can be done by this robot

By using this robot we can protect human being from work of highly risk for e.g. to defuse bomb, to repair machines.

VI. FUTURE SCOPE

Currently we control the robot with our hand gesture .In future we can develop the project to Control vehicle.

VII. CONCLUSIONS

We have proposed the system which is useful for many purpose like military purpose and domestic purpose to avoid human risk .It is very easy and user friendly way to control robot. This system is very cost effective to replace other pre-existing system. This system gives user friendly control over robot.

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