

Hand Gesture Controlled Robot using Arduino

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Abstract – By and large, robots are customized to perform explicit assignments. This restricts the utilization of these robots. To build the utilization of robots where conditions are unsure, for example, firefighting or salvage activity we can make robots which adhere to the directions of a human administrator and play out the undertaking. Along these lines choices are taken by the working conditions by the administrator and undertaking is performed by the robots in this manner we can utilize these robots to play out those errands that might be unsafe to people. Likewise, this framework isn't mind boggling as sensors utilized are regular for example Flex sensors, gyrorator, and accelerometer. Flex sensors recognize an adjustment in obstruction esteems while spinners and accelerometers distinguish changes in relative speeds. The robots can be customized utilizing microcontrollers to distinguish these progressions and work in any ideal manner.

Key Words: Robot, Hand Gesture, RF Transmitter & Receiver, Flex sensor, Arduino

1. INTRODUCTION

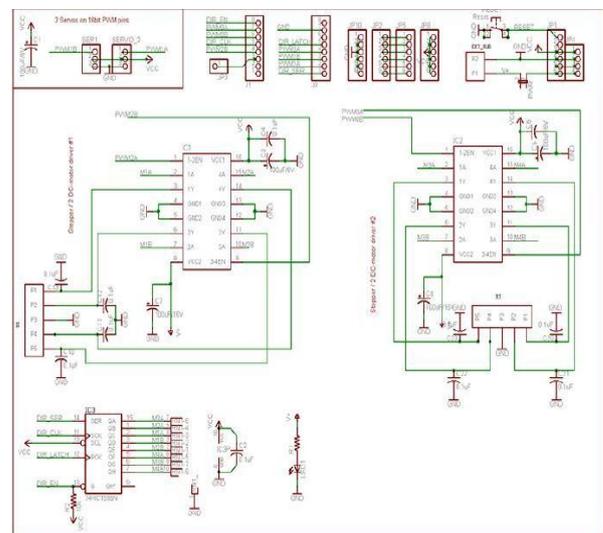
As of late, solid endeavors have been done to create keen and regular interfaces among clients and PC put together frameworks based with respect to human motions. Motions give an instinctive interface to both human and PC. Along these lines, such motion based interfaces can substitute the regular interface gadgets as well as be abused to broaden their usefulness. The objective of signal acknowledgment in the Computer Science field has consistently been the minimization of the separation between the physical world and the advanced world. Various calculations have been proposed to accomplish the objective of signal acknowledgment and its utilization in speaking with the advanced world. Signals can be followed utilizing accelerometers and flex sensors. This paper manages the structure and usage of a remote motion controlled Robot utilizing Arduino processor and modest equipment necessities.

2. PROPOSED WORK

Signal acknowledgment advancements are a lot more youthful in the realm of today. Right now there is a lot of dynamic research in the field and little in the method of freely accessible executions. A few methodologies have been created for detecting signals and controlling robots. Glove based method is a notable methods for perceiving hand motions. It uses a sensor joined to a glove that straightforwardly quantifies hand developments. A Gesture

Controlled robot is a sort of robot which can be constrained by hand signals and not as our forefathers would have done it by utilizing catches. The client simply needs to wear a little transmitting gadget on his hand which incorporates a sensor which is an accelerometer for our situation. Development of the turn a particular way will transmit an order to the robot which will at that point move a particular way. The transmitting gadget incorporates a Comparator IC for allocating legitimate levels to the info voltages from the accelerometer and an Encoder IC which is utilized to encode the four-piece information and afterward it will be transmitted by a RF Transmitter module. At the less than desirable end, a RF Receiver module will get the encoded information and decipher it by utilizing a decoder IC. This information is then prepared by a microcontroller and passed onto an engine driver to turn the engines in an extraordinary arrangement to make the robot move a similar way as that of the hand.

2.1.CIRCUIT DIAGRAM



2.2. COMPONENTS

2.2.1. Arduino

Arduino Uno It is a microcontroller board dependent on ATmega328 which has 14 computerized I/O and 6 simple pins. It has everything that is expected to help the microcontroller. Just associate it to the PC with a USB link to begin with the Arduino Uno board. It is adaptable, simple to utilize equipment and programming. Arduino Uno can detect nature by accepting contribution from an assortment of

sensors and can influence its environmental factors by controlling lights, engines, and different actuators.

2.2.2. Flex sensor

Flex sensor is fundamentally a variable resistor whose terminal opposition increments when the sensor is bowed. Thus, this sensor opposition increment relies upon surface linearity. Along these lines, it is normally used to detect the adjustments in linearity.

As appeared above figure, when the outside of flex sensor is totally straight it will have its ostensible opposition. At the point when it is bowed 45° edge the FLEX sensor obstruction increments to twice as in the past. Furthermore, when the twisted is 90° the obstruction could go as high as multiple times the ostensible opposition. Along these lines, the opposition over the terminals rises directly with bowed point. Along these lines, one might say the flex sensor changes over flex edge to opposition parameter.

2.2.3. Comparator IC (LM324)

The comparator IC thinks about the simple voltage got from the accelerometer and contrasts it and a reference voltage and gives an especially high or low voltage. The got signal is very loud and of different voltage levels. This ic thinks about those levels and yields as 1 or 0 voltage level. This procedure is called signal molding. The figure appeared underneath is the comparator IC. The pins 1, 7, 8 and 14 are yield pins. A reference voltage is associated with the negative terminal for high yield when info is a high or positive terminal for high yield when information is low from the LM324 IC.

2.2.4. Motor Shield

Sun Founder L293D is a solid incorporated, high voltage, high ebb and flow, 4-channel driver. Fundamentally, this implies utilizing this chip you can utilize DC engines and force supplies of up to 16 Volts, that is some truly enormous engines and the chip can gracefully a most extreme current of 600mA per channel, the L293D chip is additionally what's known as a sort of H-Bridge. The H-Bridge is ordinarily an electrical circuit that empowers a voltage to be applied over a heap in either

2.2.5. DC Motor

DC engine is utilized for the transformation of direct current into mechanical movement. The mechanical movement could be revolving or direct. The activity of the DC engine depends on the rule that when a current-conveying conductor is set in an attractive field, the conductor encounters a mechanical power. The speed of a DC engine can be constrained by changing the voltage applied to the armature or by changing the field current. DC engines can be utilized for the development of the automated vehicle.

2.2.6. Battery

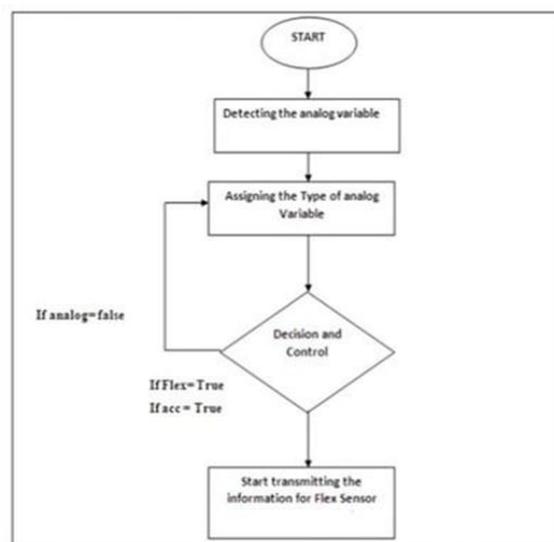
A battery is a gadget comprising of at least one electrochemical cells. A battery is a gadget that straightforwardly changes over compound vitality to the electrical vitality. The reason for the battery is to flexibly 12 volts to work DC engines.

2.2.7 RF Transmitter & Receiver

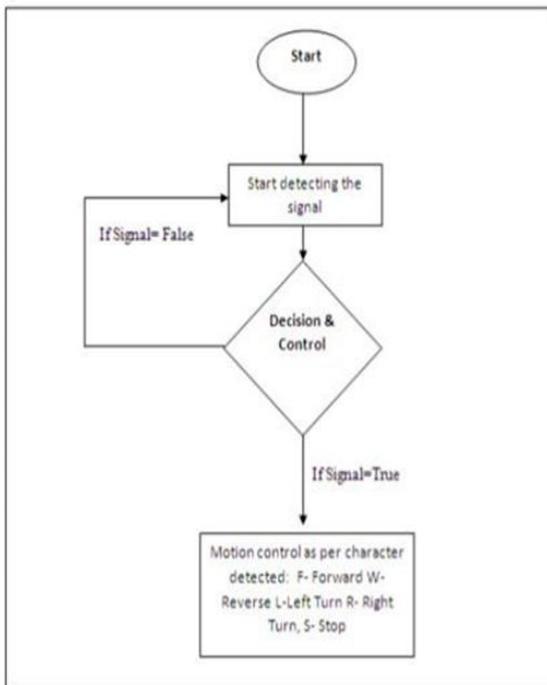
The transmitter unit shows the general square graph of the transmitter unit of the undertaking. Flex sensor and accelerometer are interfaced with a microcontroller. Contribution from a remote camera mounted on a robot is given to the controller also. Yield gadgets are LCD show and RR transmitter unit of CC2500. On the showcase, orders are shown like forward, opposite, left and right likewise middle of the road esteem from the sensors can likewise be printed. All the data is communicated on 2.4GHz recurrence remotely. Produced values signal is completely encoded and there is no block attempt of some other electromagnetic sign

The recipient part of RF module gets transmitted signals in synchronization. These approaching signs are simple in nature. These are changed over into computerized in microcontroller itself. Guidelines are handled and yield signals are given to engine driver, by the yield of which the engine activities take place. LM293 engine driver gives 12V sign to help in speed though just controlling is finished by controller's 5V flexibly. The two units are controlled by 12V directed gracefully. ATMEGA 16 is a major canny piece of the entire gets together close by a presentation is utilized to show the status of the robot.

2.3 FLOW CHART



basic flow diagram for transmitter



basic flow diagram for receiver



Fig -1: Model of Robot Control Using Human Hand Gesture

3. CONCLUSIONS

This plan includes the huge utilization of these days accessible trendsetting innovation in the field of installed hardware and unguided correspondence with the most noteworthy level of security and straightforwardness in applications. The matter of fascination of this undertaking is that it gives a brilliant measure of advantages in a financially savvy way. It gives the encryption in correspondence, transmits the video signals at higher information rates. The range indicated is sufficiently noteworthy to evaluate the model alongside the continuous application it has. Another investigate about this plan is that its quick reaction. The task is all around figured out how to react to the sensor activities inside seconds and produce an alive picture on the showcase gadget simultaneously. Building up the model of signal-controlled robot joining the accompanying highlights like issue free control, more prominent inclusion for the handset, cost-adequacy, spying robot abilities, speedier time reaction with future extension arrangement

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BIOGRAPHIES



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