
Motion Controlled Robot utilizing RF Module

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ABSTRACT

The world is heading towards automation where humans will be replaced by robots as employees in many reputed organizations in the future. In today's world, in almost all the sectors we use robots where the conditions are uncertain like fire accidents or any rescue operations. Robots are built or programmed to perform the tasks which are performed as well as the tasks which cannot be performed by the humans. The existing robots uses zigbee communication which is not cost efficient and cannot be used in domestic environments. The proposed system describes the gesture controlled robot which can be controlled by normal hand gestures. It consists of two components the transmitter will transmit the signal according to the position of the accelerometer and our hand gesture. The receiver receives the signal and makes the motor move in respective direction. Here the program is designed by using a arduino Uno.

Keywords: Gesture recognition, RF module, controller, accelerometer.

1. INTRODUCTION

Understanding of human motions by a PC is utilized for human-machine communication in the territory of PC vision. The primary reason for signal acknowledgment look into is to recognize a specific human motion and pass on data to the client relating to singular motion. From the corpus of motions, particular motion of intrigue can be distinguished, and based on that, particular charge for execution of activity can be given to the machine. General point is to make the PC to comprehend human non-verbal communication, in this way crossing over any barrier amongst machine and human. Hand motion acknowledgment can be utilized to improve human PC association without relying upon customary information gadgets, for example, console and mouse. Hand signals are widely utilized for tele automated control and applications. Automated frameworks can be controlled normally and naturally with such tele mechanical correspondence. A conspicuous advantage of such a framework is, to the point that it exhibits a characteristic method to send geometrical data to the robot, for example, left, right, and so on. Mechanical hand can be controlled remotely by hand motions. Research is being completed around there for quite a while. A few methodologies have been created for detecting hand developments and relating by controlling automated hand. As of late, solid endeavors have been done to

create savvy and regular interfaces amongst clients and PC construct frameworks situated in light of human signals. Signals give a natural interface to both human and PC. In this way, such motion based interfaces can't just substitute the basic interface gadgets, however can likewise be misused to expand their usefulness.

Glove based method is outstanding methods for perceiving hand motions. It uses sensor disengaged mechanical glove gadgets that specifically measure hand or potentially arm joint edges and spatial position. In spite of the fact that glove-based gestural interfaces give more exactness, it limits opportunity as it expects clients to wear bulky fix of gadgets. Jae-Ho Shin utilized entropy investigation to separate hand district in complex foundation for hand motion acknowledgment framework. Robot controlling is finished by Fusion of Hand Positioning and Arm motions utilizing information glove. In spite of the fact that it gives more exactness, it limits flexibility because of need of wearing gloves. For catching hand motions accurately, appropriate light and camera point are required. The issue of visual of visual hand acknowledgment and following is very testing. Numerous early methodologies utilized position markers or shaded groups to make the issue of hand acknowledgment less demanding, yet because of their bother, they can't be considered as a

characteristic interface for the robot control. We have proposed a quick and additionally programmed hand motion discovery and acknowledgment framework. This approach of signal distinguishing proof is based on perceived hand motion and can be utilized as a part of any automated framework or machines with various particular summonses appropriate to that framework.

A critical part of a fruitful mechanical framework is the Human-Machine connection. In the early years the best way to speak with a robot was to program which required broad diligent work. With the improvement in science and mechanical technology, signal based acknowledgment came into life. Motions begin from any real movement or state however generally starts from the face or hand. Motion acknowledgment can be considered as a route for PC to comprehend human non-verbal communication. This has limited the requirement for content interfaces and GUIs (Graphical User Interface).

2.0. EXISTING SYSTEM

The current framework utilizes the XBee module. The XBee module is the extremely mainstream 2.4GHz XBee module from Digi. It is a remote correspondence module that Digi worked to the 802.15.4/ZigBee standard. It offers an information rate of 250kbps, close around 100m territory, 8 advanced IO pins e.t.c.

There are two forms of the Xbee modules; 802.15.4 (DigiMesh 2.4) and Zigbee (ZB).The contrast being that the ZB modules are perfect with ZigBee systems, where the DigiMesh is a restrictive work arrangement. Every form comes in two flavors: XBee and XBee-Pro. The XBee-Pro have an all the more intense radio, along these lines have a more drawn out range. A Xbee module is demonstrated as follows.



Fig 1.1 XBee module

2.1 DRAWBACKS OF EXISTING SYSTEM

- Range of task is significant disadvantage; the XBee module utilized for correspondence has the range up to 20 meters.
- Since the Xbee utilizes Wi-Fi administrations, we have to set up a system for its working.

3.0. PROPOSED SYSTEM

Signal acknowledgment advancements are substantially more youthful in the realm of today. Right now there is much dynamic research in the field and little in the method for freely accessible executions. A few methodologies have been produced for detecting motions and controlling robots. Glove based system is an outstanding methods for perceiving hand motions. It uses a sensor connected to a glove that straightforwardly measures hand developments.

A Gesture Controlled robot is a sort of robot which can be controlled by hand signals and not the way out 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 in a particular bearing will transmit an order to the robot which will then move in a particular course. The transmitter comprises of ATmega328 microcontroller, ADXL335 accelerometer, HT12E encoder and 433MHz RF Transmitter module. The simple esteems given by accelerometer are given to microcontroller to change over them to computerized and afterward from microcontroller to the encoder to encode the information and afterward from the encoder to transmitter to send the information to recipient module.

The receiver part comprises of 433MHz RF recipient module, HT12D decoder and L293D engine driver to run the engines. Here the beneficiary module gets the transmitted flag, which is decoded by the decoder IC to get the same advanced yields. These yield are conveyed forward to engine driver IC to drive the two engines. The robot moves according to tilt heading of the accelerometer in the transmitter.

Let us discuss about the advantages and the applications of the proposed system.

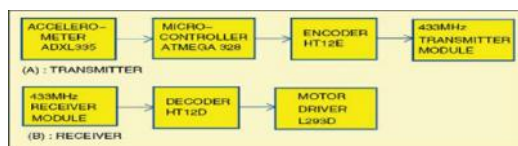
3.1 ADVANTAGES OF PROPOSED SYSTEM

•**Comfortable:** The wearable glove for signal acknowledgment is exceptionally agreeable for utilize. Besides simple signals can be set for acknowledgment.

•**Easy to utilize:** Set of predefined signals makes it simple to utilize. This arrangement of motions can be effectively reached out for more arrangement of undertakings and edge of development of robot.

•**Mobility:** This robot can be effectively available from a separation.

•**Interception:** Intercept the Human Hand Gestures helpfully.



3.2 ARCHITECTURE

Block diagram of gesture controlled robot

Motion acknowledgment has been broadly examined. Most of the past work has concentrated on identifying the shape of hand development. PC vision procedures in various structures have been broadly investigated toward this path. For a current illustration, VisionWand utilizes PC vision to perceive the development of an inactive wand with a predefined shading design. While the most widely recognized frame requires at least one cameras to catch hand development, the Wii remote has the camera inside the remote and identifies movement by following the relative development of IR transmitters mounted on the show. Along these lines, it essentially maps the three-dimensional remote development onto a planar surface. This makes an interpretation of a motion into penmanship fitting a rich arrangement of penmanship acknowledgment strategies. Vision-based strategies, in any case, are on a very basic level restricted by their equipment prerequisites (i.e. cameras or transmitters) and generally high calculation stack. Brilliant glove based arrangements have been researched to perceive fine signals, for instance finger development and compliance, rather than hand development. These arrangements require the client to wear a glove labeled with numerous sensors to catch the movement of fingers and submit fine granularity.

While they frequently yield noteworthy exactness, these arrangements are lacking for unconstrained association with purchaser gadgets and cell phones, in view of high cost of the glove and the high overhead of engagement.

As ultra-low power, minimal effort accelerometers, gyrotors, and compasses begin to show up on buyer hardware and cell phones, numerous have as of late examined motion acknowledgment in view of the time arrangement of increasing speed, frequently with extra data from a spinner or compass. Flag preparing and adhoc acknowledgment techniques are investigated. LiveMove Pro from Ailive gives a motion acknowledgment library in light of the accelerometer in the Wii remote. LiveMove Pro focuses at client autonomous signal acknowledgment with predefined motion classifiers and expects 5 to 10 preparing tests. No deliberate assessment of the exactness of LiveMove Pro exists.

Hidden Markov Models (HMM), explored in, is the standard strategy for discourse acknowledgment. Be that as it may, HMM-based techniques require broad preparing information to be powerful. The creators of understood this and endeavored to address it by changing over two examples into a huge arrangement of preparing information by including Gaussian clamor. While the creators indicated enhanced precision, the viability of this strategy is probably going to be very constrained in light of the fact that it basically accept that varieties in human signals are Gaussian. Another confinement of HMM based strategies is that they frequently require information of the vocabulary keeping in mind the end goal to arrange the models appropriately, e.g. the quantity of states in the model. In this way, HMM based techniques may endure when clients are permitted to pick gestures freely.

There have been developing endeavors in discovering regular routes for human-machine association (HMI) for sight and sound excitement . That is on the grounds that customary routes, e.g., by utilizing a mouse or a console, are intrinsically restricted by speed and space, and absence of a submerged sense inside the recreated conditions. Lately, signal acknowledgment for HMI has turned out to be well known on the grounds that it defeats the restrictions of customary waysand advances individual experience amid the connection amongst human and machine for amusement. Signal acknowledgment is likewise imperative in robotized

reconnaissance and human observing applications, where they can yield important hints into human exercises and aims.

Motions are characterized as human movement groupings with directions performed in a short interim of time. Human signals are a characteristic methods for collaboration and correspondence among individuals. Signals utilize hand, appendage, and body movement to express thoughts or trade data non-verbally.

Motions can be separated into two gatherings: static and dynamic signals. As indicated by input gadget, the motion acknowledgment procedure can be partitioned into three classifications: glove based, vision based, and accelerometer based. Glove information based signal acknowledgment frameworks expect clients to wear gloves and awkward gadgets to record the development status. The execution of vision construct frameworks is depended vigorously with respect to the activity condition, e.g, the foundation and the lighting condition. Furthermore, these frameworks confront the impediment issue, not to mention the low examining issue.

With the fast advancement of small scale electro-mechanical framework innovation (MEMS), the accelerometer based motion acknowledgment turns out to be progressively mainstream, [3] and right now indicates potential in useful applications.

Some current surveys clarified signal acknowledgment framework applications and its developing significance in our life, particularly for Human PC Interaction HCI, Robot control, amusements, and observation, utilizing diverse apparatuses and calculations.

4.0 CONCLUSION

Its straight forwardness and proficiency permit execution on an extensive variety of gadgets, including basic 16-bit microcontrollers, as long as an accelerometer is accessible. Our test show that this robot accomplishes 98.6% exactness beginning with just a single preparing test. This is practically identical to the revealed exactness by HMM based techniques with 12 preparing tests (98.9%). We demonstrate that the quantization enhances acknowledgment exactness and diminishes the calculation stack. Our assessment likewise features the test of varieties over the opportunity to client subordinate signal acknowledgment and the test of

varieties crosswise over clients to client free motion acknowledgment... In the present digitized world, preparing speeds have expanded significantly, with PCs being progressed to the levels where they can help people in complex errands.. Mechanical control is reliant on exact hand motion location and hand motion recognition specifically relies upon lighting quality. Other than power of the framework, proposed strategy for controlling robot utilizing hand motion is quick. This procedure can be reached out for more mind boggling robots in the fields of PC vision and mechanical autonomy.

FUTURE WORKS

) An on-board camera can be installed for monitoring the robot from faraway places. All we need is a wireless camera which will broadcast and a receiver module which will provide live streaming.

) Gesture recognition, along with voice recognition, facial recognition, lip movement recognition and eye tracking combined can be used to create something called a perceptual user interface (PUI), a completely different way to interact with computer systems which will improve usability and creativity by leaps and bounds.

) In homes, offices, transport vehicles and more, gesture recognition can be incorporated to greatly increase usability and reduce the resources necessary to create primary or secondary input systems like remote controls, car entertainment systems with buttons or similar.

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