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Gesture of Robotic Arm using IOT Network

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Abstract: ***This paper present the research activities and the results obtained to controlling the robotic hand using man wearied robotic gloves. The practical setup is obtained with the help of robotic arm. This is paper updates the existing system, in which short distance controlling can be done. The model developed will be of minimum cost and can be used in variety of places and also in various applications. The interest in robotics has been steadily increasing in recent times and research on robots for new and diverse fields is ongoing. This project discusses the current research and development on robot actuator, which is used to control the joints of robots, and focuses on developing more efficient technology for joint control, as compared with the current technologies. It also aims to find means to apply the abovementioned technology to diverse industrial fields. We found that easy and effective control of actuators could be achieved by using IOT network, which were widely being used on wireless communications. It is proved that the developed wireless actuator could be used for easy control of various robot joints.***

Keywords: IOT Network, The Practical Setup Is Obtained With The Help Of Robotic Arm.

I. INTRODUCTION

Over the past decades, significant work has been done in the field of Robotics. The most common manufacturing Robot is the Robotic arm. Industrial Robots are designed to do exactly the same thing, in a controlled environment. A Robotic arm is a type of mechanical arm, usually programmable, with similar functions to a human arm. This study discusses the current research and development on Robot actuator, which is used to control the joints of Robots and focuses on developing more efficient technology for joint control as compared with the current technologies. Thus arm can assist a lot in search and rescue operation. In this tough world like ours where it is not possible for humans to react everywhere, especially in the case of natural disaster, technology like this can come to a great aid. The human life are more valuable and we take necessary steps to protect from any kind of danger, but when we thing about of people who are serving the life of the others there life is also a valuable and they should also be protected but it is not obvious, they have to protect us. In that case many lives has been passed away due to taking these kind of risk. Whereas as in case of medical emergency mobilising the patient from one place to the other is impossible and we may not able to get adequate time for mobilising.

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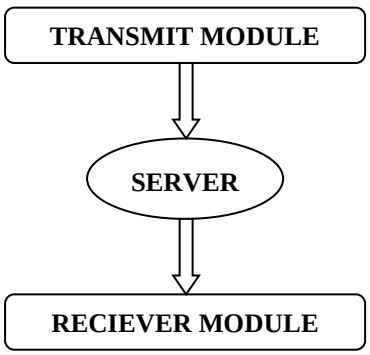
Where time place a major role in protecting the life of the others. These situations have to be taken into account because human life is very precious. The last few minutes will be more important to that patient Is more important.
Life is more precious once last it cannot be regained. In that situation our project aims in reducing their risk in both scenario where human life is important.

In this project we developed gloves kit where it will be useful in case of emergency. Where the risk can be reduced and precious life can be saved.

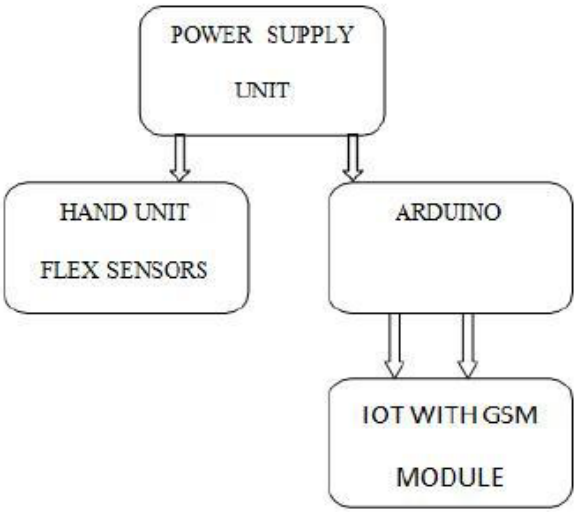
II. SYSTEM OVERVIEW

The system has three module a transmitter module, receiver module and web server module. In transmitter module is interfaced with the gloves where necessary information about bending of joints is obtained. And reaches the server module where it is used to store the commands that has been transmitted and with help of the AT commands the commands saved in the transmitter are transmitted to the receiver. Where the commands are collected and decoded with the help of the microcontroller. And those commands are given to the mechanical arm based upon the movements developed in the transmitter part, the mechanical arm setup does the same processes. In the transmitter part we make use of the help of the sensor called as the flex sensor. We used a one sensor for each joints and the change in resistance value is collected and corresponding voltage drop is generated and the suitable flex value is obtained. Based upon the flex value received the Arduino transmits the Command to the server part. In server part the commands are stored and can be viewed with help of our ip address. And by using AT commands the commands the transmission begins. Now days the connectivity is very common and we remain connected throughout. And the receiver part can be anywhere where it has to be connected. Based upon the received commands from the transmitter section the receiver decodes it and suitable information is given to the Arduino where it is used to drive the motor driver circuit. The DC motors will be fixed in the mechanical setup of the arm where suitable actions will be performed. There will not be any delays, if the connectivity fails it can continue.



III. SYSTEM ARCHITECTURE

The main function of the transmit module is to transmit the Flex value received from the flex sensor to the receiver section through the web server.



Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others. Power supplies for electronic devices can be broadly divided into linear and switching power supplies. The linear supply is a relatively simple design that becomes increasingly bulky and heavy for high current devices; voltage regulation in a linear supply can result in low efficiency. A switched-mode supply of the same rating as a linear supply will be smaller, is usually more efficient, but will be more complex.

Transformers waste very little power so the power out is (almost) equal to the power in. Note that as voltage is stepped down current is stepped up. The ratio of the number of turns on each coil, called the turn's ratio, determines the ratio of the voltages. A step-down transformer has a large number of turns on its primary (input) coil which is connected to the high voltage mains supply, and a small number of turns on its secondary (output) coil to give a low output voltage.

Turns ratio=Vp/Vs=Nn/Ns and Power out=Power in Vs*Is=Vp * Ip

IV. FLEX SENSOR

One side of the sensor is printed with a polymer ink that has conductive particles embedded in it. When the sensor is straight, the particles give the ink a resistance of about 30k Ohms. When the sensor is bent away from the ink, the conductive particles move further apart, increasing this resistance (to about 50k Ohms when the sensor is bent to 90º).

When the sensor straightens out again, the resistance returns to the original value. By measuring the resistance, you can determine how much the sensor is being bent. The simplest way to incorporate this sensor into your project is by using it in a voltage divider. This circuit requires one resistor. Many values from 10K to 100K will work, but we'll use a 10K resistor here. Connect the flex sensor to your arduino.

The preferred spelling of the word "acknowledgment" in America is without an "e" after the "g." Avoid the stilted expression "one of us (R. B. G.) thanks ...". Instead, try "R. B. G. thanks...". Put sponsor acknowledgments in the unnumbered footnote on the first page.

V. ARDUINO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 Digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator. Based upon the flex value suitable commands are transmitted through help of the GSM module with help of the IOT board. In the receiving section of the board based upon the commands suitable movements is initiated.

VI. IOT BOARD

Normally used in all type of cell phones for communication purpose. The suitable commands are used for particular application purpose.

AT+CMGF=1->Used for text message

To perform and use data connection we have to activate the data available in the that. Suitable commands for this operation are.

AT+CREG Used to initiate the data.
ATA Answering in Voice Mode
ATD Dial command in Voice Mode
ATH Hang up in Voice Mode
ATZ Reset from Voice Mode
AT+FCLASS= 8 Enter Voice Mode.
AT#BDR Select baud rate (turn off autobaud)
AT#CID Enable Caller ID detection and select reporting.
AT#CLS Select data, fax, or voice
AT#MDL? Identify model
AT#MFR? Identify manufacturer
AT#TL Transmit level control
AT#REV? Identify revision level
AT#RG Record gain control
AT#SPK C hang the setting of Speakerphone
AT#VBS Bits per sample (ADPCM)
AT#VBT Beep tone timer
AT#VLS Voice line select (ADPCM)
AT#VRA Rin gback goes away timer (originate)
AT#VRX Voice Receive Mode (ADPCM)
AT#VSD Silence deletion tuner (voice receive, ADPCM)

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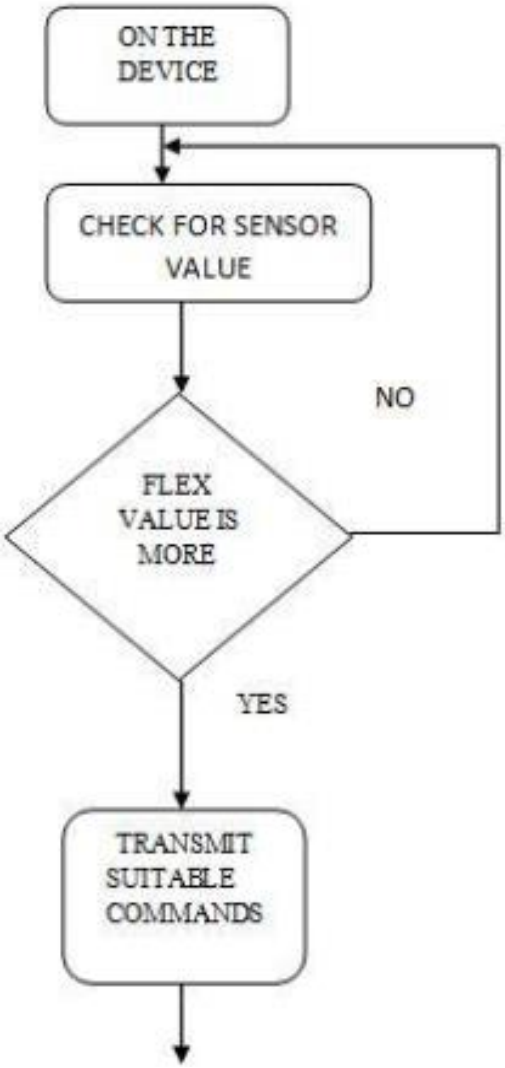
VII. FLOW CHART

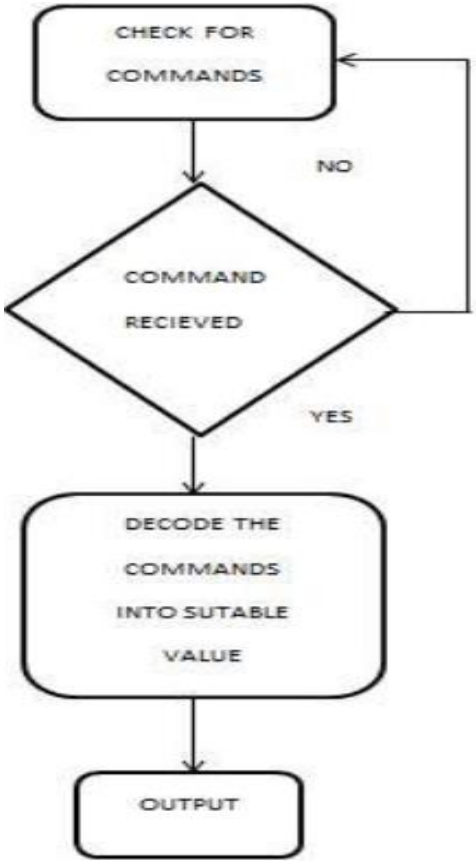
1. TRASNMITTER



The information will be transmitted from the IOT board and stored in the server. The commands can be viewed with the help of the ip address. The transmission progress will be the help of the AT commands used to transmit data in the phones system. The connectivity speed vary from place to place

2. RECIEVER

The output will be seen through the help of the mechanical setup. Which resembles the human arm, the movements will be controlled with the help of the DC motor. The information will be transmitted from the IOT board and stored in the server. The commands can be viewed with the help of the ip address. The transmission progress will be the help of the AT commands used to transmit data in the phones system. The final output is received at the receiver module. . Thus the range can be increased with the help of this, and accuracy is also maintained to the core extend. Thus the receiver is the one which helping to get the information from the transmitter without any delay or loss of data from the sender thus maintining the accuracy of the system.



VIII. LITERATURE SURVEY

Robots can be used to perform surgeries in a more accurate and precise manner where the surgeon can make decisions and operate the robot as and when needed at the spur of the moment. This ensures that no human error is involved, there is a reduced amount of blood loss, and the area of surgery is comparatively smaller. In minimally invasive robotic surgery (MIRS), the surgery is performed by the surgeon using tele-operated robotic tools instead of using manual instruments. In this scheme, robots do not replace the surgeon, but instead provide the surgeon with improved abilities to perform the intricate, precise surgical manipulations. The following are the examples of existing MIRS systems: Da-Vinci Robot This system has been approved by the FDA for laparoscopic, non-cardiac thoracoscopic, prostatectomy, craniotomy, cardiac revascularization, urologic surgical, gynaecologic surgical, paediatrics surgical and trans-oral otolaryngology surgical procedures. Zeus System the Zeus system has the similar capabilities as the Da Vinci system. It has been approved by the FDA as well. It is composed of a master console and 3 table-mounted robotic arms. Two robotic arms mimic the surgeon's arms and hold the surgical tool and the third arm is a voice-controlled robotic endoscopic system [6]. The endoscopic instrument mounted on the slave manipulator provides five degrees of freedom to extend the dexterity inside the patient for the surgeon. Robotic systems thus have proven to play a very important role in the medicinal and surgical sector,

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Be it in manufacturing medicines and drugs or carrying out simple tasks in specific surgeries. However, robots do not take over the whole procedure in a surgery, but certainly assist the surgeons to perform the task accurately and avoid large incisions, infections and blood loss.

IX. CONCLUSION

A prototype model of robotic hand for telesurgery using haptic technology was implemented. The arduino boards were configured to communicate which facilitated the data transfer wirelessly. Thus the range can be increased with the help of this, and accuracy is also maintained to the core extend. Thus the life of many people who are encouraged to take risk can be saved. The arm can be implemented to entire human structure in future to facilitate the exact replica of the human.

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