

ROBO LEG FOR PHYSICALLY CHALLENGED USING ARDUINO

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Abstract: *in this paper, aims in designing a leg for physically challenged people who can be fixed to amputated leg and the movement of the leg can be controlled by the user himself by TV remote depending on his requirement. The system makes use of a one DC motor which is used for controlling the knee movement, Another DC motor connected to wheels will be in the shoe of ROBO leg, TV remote and an IR receiver to control the knee movement and the wheel movement of leg. The controlling device of the whole system is a microcontroller. IR receiver, two DC motors are interfaced to the microcontroller through motor drive the microcontroller gets input from IR receiver which receives the data related to key pressed in the TV remote. This input is processed by the microcontroller and acts accordingly DC motors.*

(Keywords: *Motor Drive, Two dc motors, LCD display, Microcontroller, IR proximity, Battery)*

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INTRODUCTION

In this paper aims in designing a leg for physically challenged people who can be fixed to amputated leg and the movement of the leg can be controlled by the user himself by TV remote depending on his requirement. The system makes use of a one DC motor which is used for controlling the knee movement, DC motor connected to wheels will be in the shoe of ROBO leg, TV remote and an IR receiver to control the knee movement and the wheel DC motor, another are interfaced to the microcontroller. The microcontroller gets input from IR receiver which receives the data related to key pressed in the TV remote.

RELATED WORK

The concept of a wearable robotic device that would help people walk or lift heavy objects has been around for decades. To give power at joints of leg to perform naturally. To give supplementary torque at joints of handicapped and aged Person. To provide independency while exercising the effected leg for recovery after any mishaps. There are two motors used to provide external torque for joints the leg. Power supply is given by using two batteries such as 6V and 12V. When switch is ON, Power supply from battery passes to electronic control device. The electronic control device is used to control the motion of motor. There are three switches are used. Out of these three switches one switch gives backward, another one is forward. The automatic switch is provided for automatic movement of leg.

The cost structure is less as compared to other supporting structures, so it is affordable to ordinary persons. The capacity of robots to deliver training with high intensity and repeatability. Using optimum motor speed and torque cost can be saved. Running or movement of model takes place due to the actuation of servo motor.

PROPOSED PLAN OF WORK

There are many people who are handicapped by their legs also some aged person can't move their legs normally because of lack of required power to move leg normally. Such kinds of people are unable to make movements of their legs by their own effort. To help these people ROBOTIC SUPPORTING LEG can be used.

The idea behind this paper is as per the Program, Manually TV remote is used to move the leg. The electronic control device is used to control the motion of motor such as backward and forward. Then finally TV remote control the whole operation by that person only, earns who are using robotic leg. Fig:1 show the basic flow for to run the DC motor. Here the whole operation was controlled by microcontroller here first IR proximity is connected to the microcontroller as input one and second input as we connected as power supply. Later we connected output to the microcontroller as motor drive these motor drive connected with two DC motors.

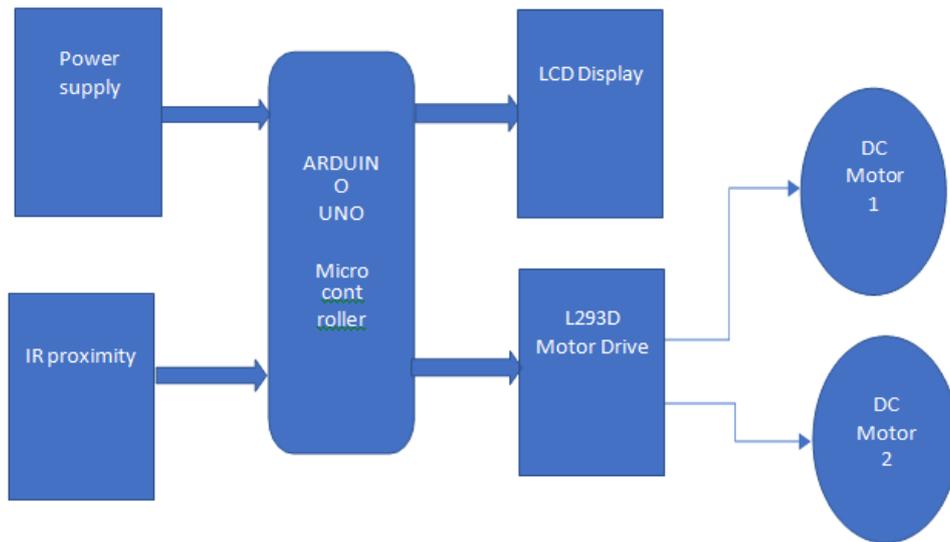


Fig.1. Basic Flow

The main block is microcontroller 89S52. It contains 256*8-bit internal RAM. Battery gives the essential power supply required to the microcontroller. Output voltage of the battery is Motor relay driver circuit consisting of ULN2003 IC which is used to drive the relay. Relays are used because only low power signals are used to control the circuit. In this paper four relays are used to drive two motors that are two relays for each motor. Each relay gives output voltage of 6V and each motor requires input voltage of 12V respectively. Here two motors are used, one is at the hip joint and another is at the knee joint. These two motors are DC motors. In a DC motor the coil of wire which carries the current generates an electromagnetic field and by switching on or off the current in the coil we can switch the direction of the magnetic field. So, we are able to do movement of our robot legs. LCD display is used 16*2 types. The function of an LCD display is to display the status of events performed.

METHODOLOGY

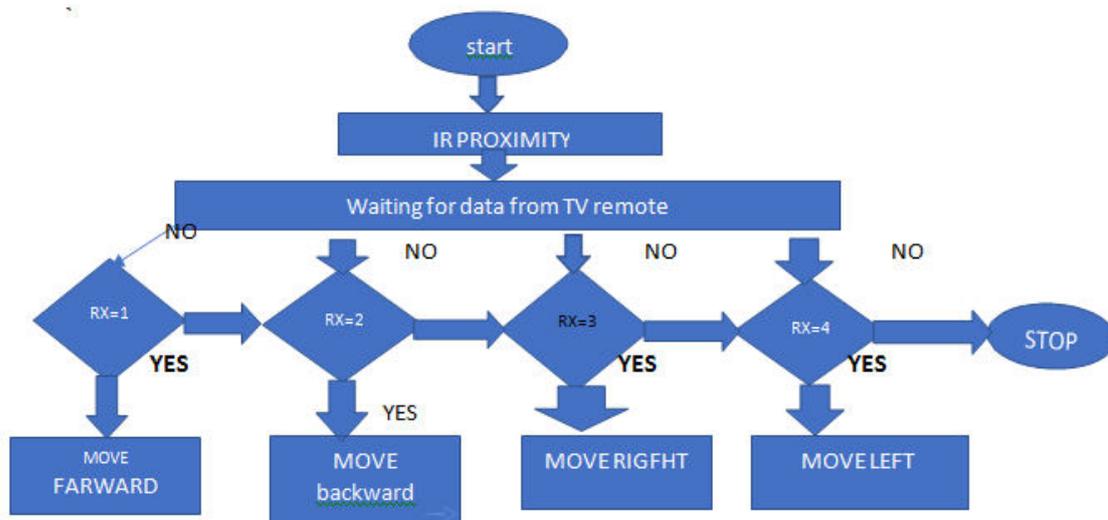


Fig.2. Flow chart

A robot leg is a mechanical leg and able to perform the same functions as that of a human leg. It is typically programmed to execute similar functions as that of the human leg in their daily life. It is also called a prosthetic leg; however, the robotic leg can be controlled electrically or mechanically. To have a robotic leg exhibit behavior of the human leg. People have rigidity, relaxation, involuntary contraction of the muscles and post-polio syndrome. Even if people do not suffer from these physical problems, aging brings various troubles on his/her mortality. Most of the people who have the problem in their lower limb due to these symptoms or aging are unable to walk and bed ridden all day long with the worst. Moreover, these depress the patient's feelings and lose his/her life of living. To relieve these problems and support the patient's life, it is also important and provides a safe and convenient transportation device.

RESULT

The result of this paper is designing a leg for physically challenged people who can be fixed to an amputated leg and movement of the leg can be controlled by the user himself by a TV remote depending on his requirement.

CONCLUSION

In this research paper, A new robotic supporting leg was developed for the elderly and handicapped people and the following conclusions were drawn Running The structures supports the handicapped leg of person. Motor takes the load of leg only to move it. Along with structure leg is in balanced position

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