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Physio Arm Control for Patient using IOT Technology

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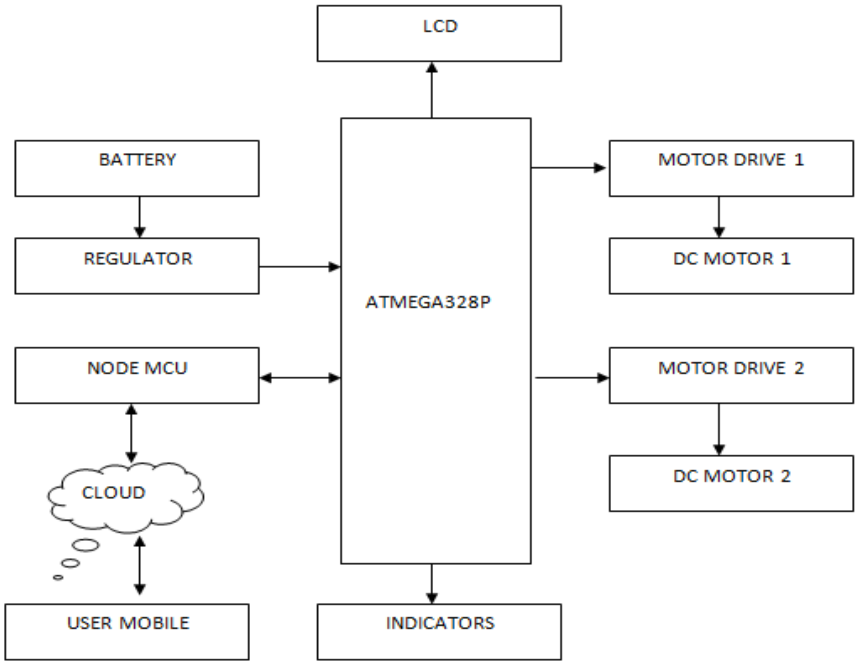
***Abstract:** This project focuses on Paralysis and stroke affected peoples are disabled to move their upper limbs. They need to give regular exercise daily. The shortage of physiotherapists and caretakers for physically disabled paralysis affected patients are increasing day by day and become serious problem in their future. The rate of patient population need physical exercise for their upper limb is also constantly increasing. Physio arm can be activated through the physiotherapist. The physiotherapist can give command to the patient arm through our device. This arm helps to straight and fold the patient arm as per our device. Servo motors are used to control the angle of rotation of the patient's arm by providing the potentiometer values from the devices. Mapping concept in the arduino programming is used for the angle control.*

I. INTRODUCTION

Most of the survey shows that, it is very expensive and the mechanical interface between physio arm and patient is not well. The proposed system of physio arm enable the person to use wisely, with cost efficient and improves the interface between device and patient. Physiotherapist are need to give an exercise to the paralysis affected patients in order to improve the performance of the limb joints. The Shortage of Physiotherapist for paralysis affected patients are increasing nowadays.By solving this, to design and develop the physio arms ranging from simple harness actuated with various control options. However, due to the cost constraints, the automated physio arms are still out of the reach of needy people. Hence we try to do it in low cost physio arms which can control high limbs and also to avoid travel for physiotherapy treatment. Here we used iot based mobile communication device which helps to control the movement of the physio arm.

A. Block Diagram



Block Diagram Description

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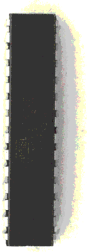
II. HARDWARE SPECIFICATION

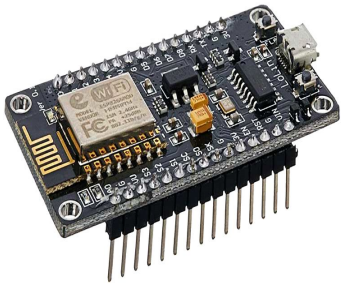
A. ATMEGA328P

It is high performance, low power controller from Microchip. ATMEGA328P is an 8-bit microcontroller based on AVR RISC architecture. It is the most popular of all AVR controllers as it is used in ARDUINO boards.



B. NodeMCU

It is an open-source Lua based firmware and development board targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.



C. Servo Motors

A servo motor is a rotary actuator or a motor that allows for a precise control in terms of the angular position, acceleration, and velocity. Basically it has certain capabilities that a regular motor does not have. Consequently it makes use of a regular motor and pairs it with a sensor for position feedback .

D. LCD

LCD is known as liquid crystal display. It is a method of displaying readings continuously, as on digital watches, portable computers, and calculators, using a liquid crystal film, sealed between glass plates, that changes its optical properties when a voltage is applied.

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III. SOFTWARE SPECIFICATION

A. Android IDE

In Android IDE software, NodeMCU package has been installed. After that, NodeMCU port has been selected and then the code is uploaded to control physio arm. The whole process is controlled by iot through mobile to access the physio arm.

B. Proposed Method

Although We have reached greater heights in technological advancements, we still fail to propose the advanced version of robotic arm. Here we control the whole joints of hand using servo motor. It is connected by IoT based android device for communication, which is used to control the movement of prosthetic arms. To keep the distance from the people, who are affected by virus and spreading, (covid 19) this project is implemented for the patients, to give the effective treatment. This innovation is designed by using Atmega 328P, Node MCU, Servo Motors, Regulator and LCD Display.

IV. RESULT

V. DISCUSSION

Physio arm control for patient using IOT technology can help the physically disabled people by giving exercise to the arm. Using IOT technology, we can control the patient arm through internet. These are mainly used to reduce the travel time for patients. In future, by using Artificial intelligent Technique and with help of EMG Sensors which is used to identify the pain of patients and can give effective treatment.

VI. ACKNOWLEDGMENT

We are highly indebted to our project guide Dr.K.Sharmilee Associate Professor, Department of Electronics and Communication Engineering for her guidance and motivation in completing this project.

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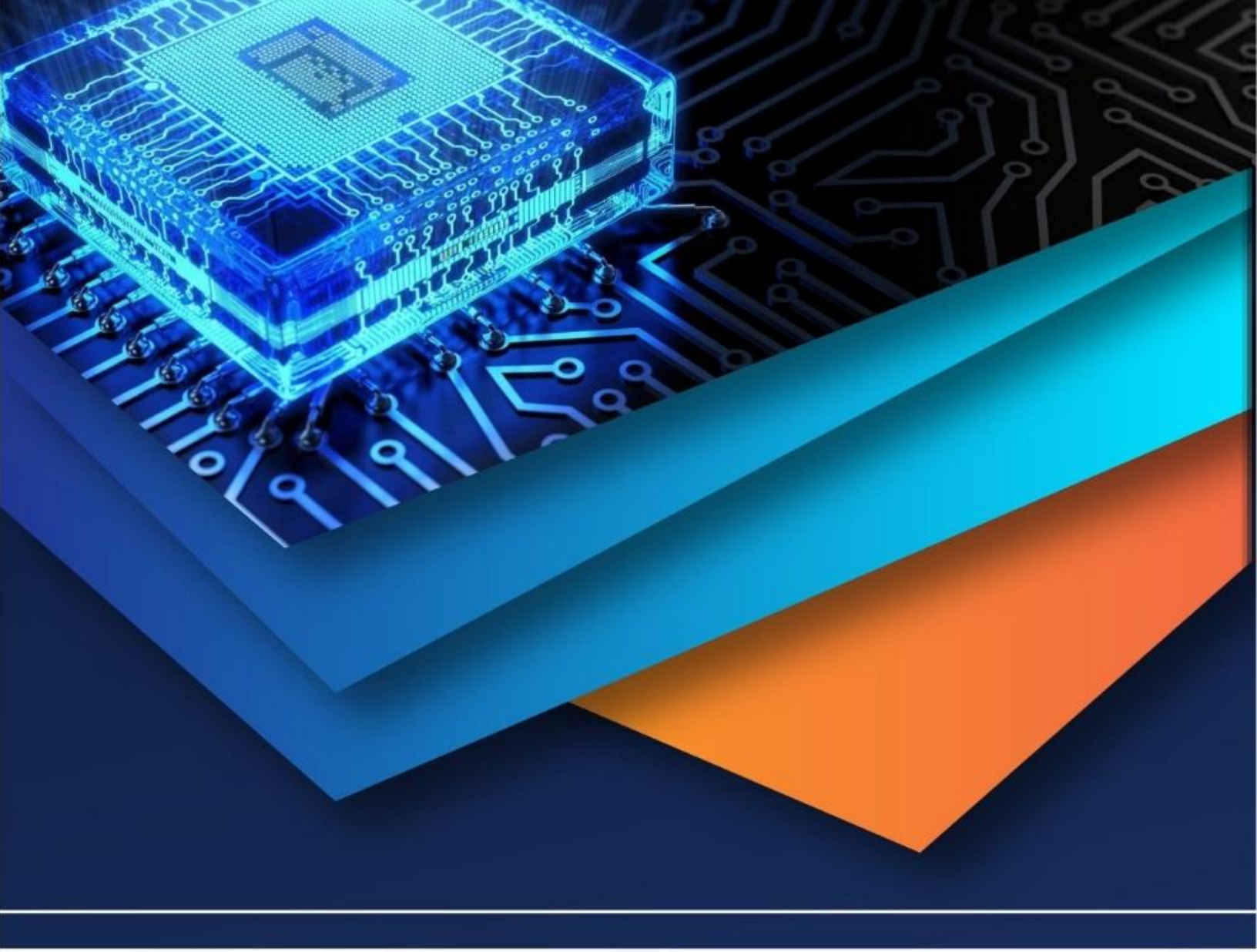

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