

MEDIROBO – A MEDICAL PRESCRIPTION WRITING ROBOT

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ABSTRACT

The paper presents an approach to design rapid and fluid movements of a universal robot to perform robot writing mimicking the doctor prescription. Reading a doctor's handwritten prescription is a challenge that most patients and some pharmacists face; an issue that, in some cases, lead to negative consequences due to wrong deciphering of the prescription. Part of the reason why doctor's prescriptions are so difficult to decipher is that doctors make use of abbreviations and medical terminology that most people don't understand. To perform the task, on-line human signing standards are created first. Robot writing task is performed using these standards and robot signatures are acquired as a result. The writing mechanism is made by speech recognition technique. This speech recognition can be provided through either by using microphone or by using android applications. Thereby the robot can make the writing mechanism according to the user's input.

Keywords: - Human-Machine interaction, Prescription Writing, Dual axis controlled Robot.

I. INTRODUCTION

In recent years, the definition of robot is generally used to mean an unmanned system or automation, as often seen in industrial applications. Generally, a robot is used to be shaped like humans, and referred to as machines and electric systems were capable of performing similar actions as humans. With the technological advancements in robotics field, efforts are being taken in researching, designing and development of robots for different practical purposes. Robots designed to assist human in their work and reduced human efforts. Nowadays, robots are designed to mimic human behaviour and perform tasks similar to human. Many research companies are developing robotic arm for performing basic functions like human arm. Among different functions, writing skills are one of function. The proposed robotic arm can be used by physically challenged person for writing operation.

Medical prescription are the instructions which is given to the pharmacist for indicating what are the medicines that the patient should have to take but due to the handwriting of the doctors, some patients and pharmacists face many problems, they can't understand the name of the written medicine. Due to this several life's that could have been saved have been lost. In order to overcome this in our proposed work, we have come out with a robot prescription writing. Robot is a machine that designed to work automatically and it performs one or more tasks with speed. In our paper we have a Bluetooth sensor which takes the data that is being given by the doctor. With the help of the Bluetooth receiver it receives the data and the robot

starts writing. With the help of the stepper motors the x and y axis can be controlled so that the text can be in order, and a server motor is being used in order to rotate the pen.

II. EXISTING SYSTEM

Reading a doctor's handwritten prescription is a challenge that most patients and some pharmacists face; an issue that, in some cases, lead to negative consequences due to wrong deciphering of the prescription. Part of the reason why doctor's prescriptions are so difficult to decipher is that doctors make use of Latin abbreviations and medical terminology that most people don't understand. In existing there is a robot is used for medical surgery in the hospital but there is no current invention is used for writing a prescription in the hospital. In current situation a doctor will write the prescription manually. There is a chance of human error, when writing an, prescriptions in the hospitals. This is a very crucial issue when attending the patients in the hospitals. Also time consumption is high.

III. PROPOSED SYSTEM

To overcome all these systems, we propose a new system called Medirobo, for prescription writing without any error. To perform the task, on-line human signing standards are created first. Robot writing task is performed using these standards after that and robot signatures are acquired as a result.

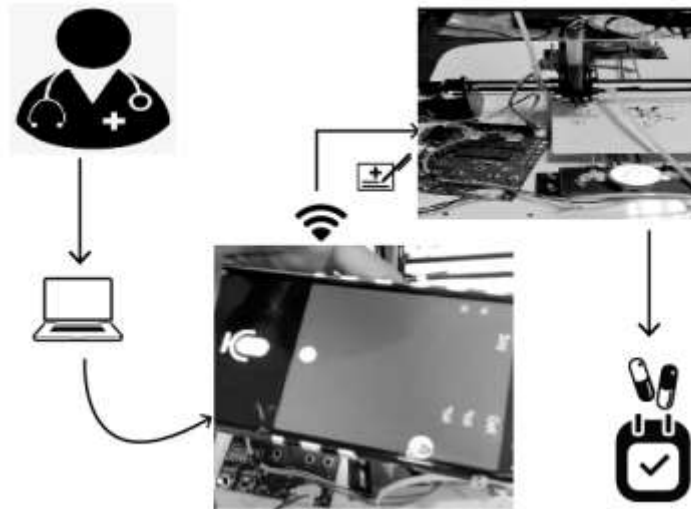


Fig 1 – Proposed System

The robot makes the written prescription chit about the patients with the help of wireless Communication. The movement-Code file created by the help of Inks Cape software then the processing software is used to send the G-Code file to the microcontroller. Then the CNC shield drive sends the controlling signals to the stepper motors and servo motor. Now the XY axis which operates as follows by the instructions given to the controller unit. The corresponding code is send the data to controller block is interfaced with motor driver unit along the DAC provides the pulse width signal to motor unit where it is been processed and final output is written and display on the paper from the output unit.

IV. SYSTEM ARCHITECTURE

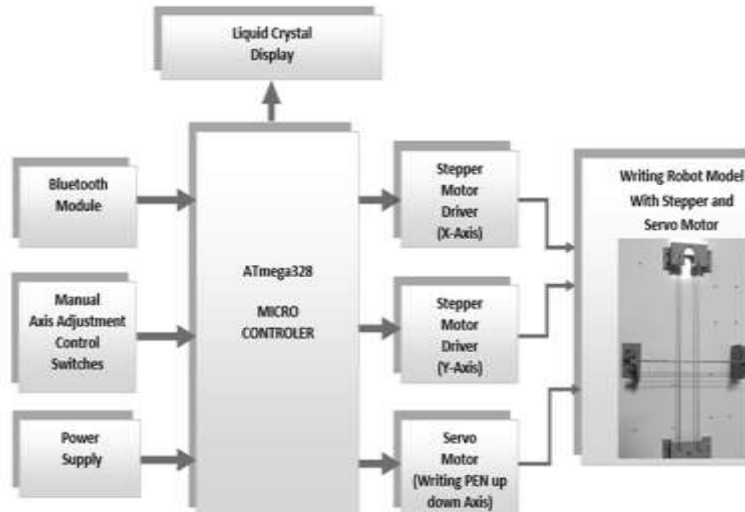


Fig 2 - System Architecture

The system uses a robot that is used for prescription writing. It designs a rapid fluid movement of a universal robot to perform dual axis control robot for writing medical prescription. The robot is connecting to 5V power supply. Then it connects with the Bluetooth device. Thus, the user gives the data and then the Bluetooth transmitter gives the data to the Arduino (ATmega328P), then it starts interfacing with the program in kit. The ULN2003 then drive the stepper motors that are connected with the dual axis that is the X and Y axis. The stepper and servo motor are moving with help of gear and belt setups. And the stepper motor starts working to rotate the writing pad. Once the data is received the server motor helps the pen to write the text. Hence the text is written.

In the Transmitter section, user gives the data to the receiver with the help of the bluetooth that is present in the mobile app (bluetooth voice) as we see in Figure .In transmitter section it contains a Bluetooth device named HC-05 that helps to connect to the receiver Bluetooth For transmitting the data, First voice app. Then the receiver receives the data from the

transmitter section. Thus, it recognizes the data and send it to the receiver section. Then the receiver starts doing its work.

In the receiver section it receives the data from the transmitter and then with the help of ATmega328P the audio is converted into text. The manual axis adjustment is used to adjust the direction. The power supply helps to transmit power to the kit. The Stepper motor is used to drive through the x & y direction and the Servo motor is used for writing the pen in up-down axis. Then the writing robot starts writing data which has been received from the transmitter.

V. SYSTEM IMPLEMENTATION

The proposed system uses the Raspberry Pi, web camera and two DC motor with Robot chassis to build this Robotic setup. It has a web camera mounted over it, through which we will get live video feed and the interesting part here is that we can control and move this robot from a web browser over the internet. As it be controlled using webpage, means it can also be controlled by using the other smart devices where we can control through the webpage.

The is implemented using ATmega328 micro controller, Stepper Motors,Servo Motor ,Embedded C and AVR IDE.

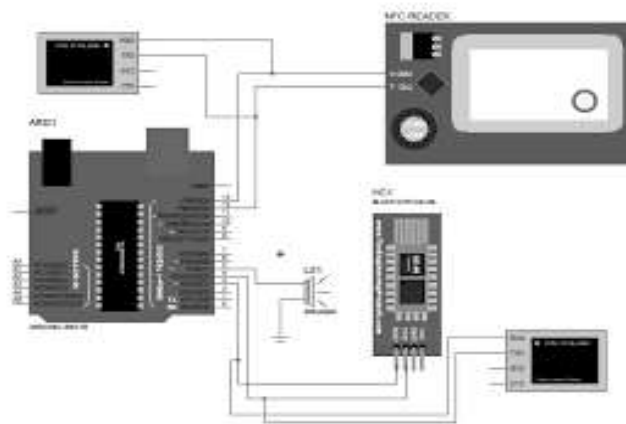


Fig 3 – Block Diagram

We build a webpage in HTML which has Left, Right Forward Backward links, clicking on which we can move the robot in any direction. Here we use the term “Motion” for getting live Video information from USB camera and used “Flask” for sending commands from webpage to The user will be observing this data on the monitor at the user end. According to the desired movement, the user will control the robot through the webpage at the user end.

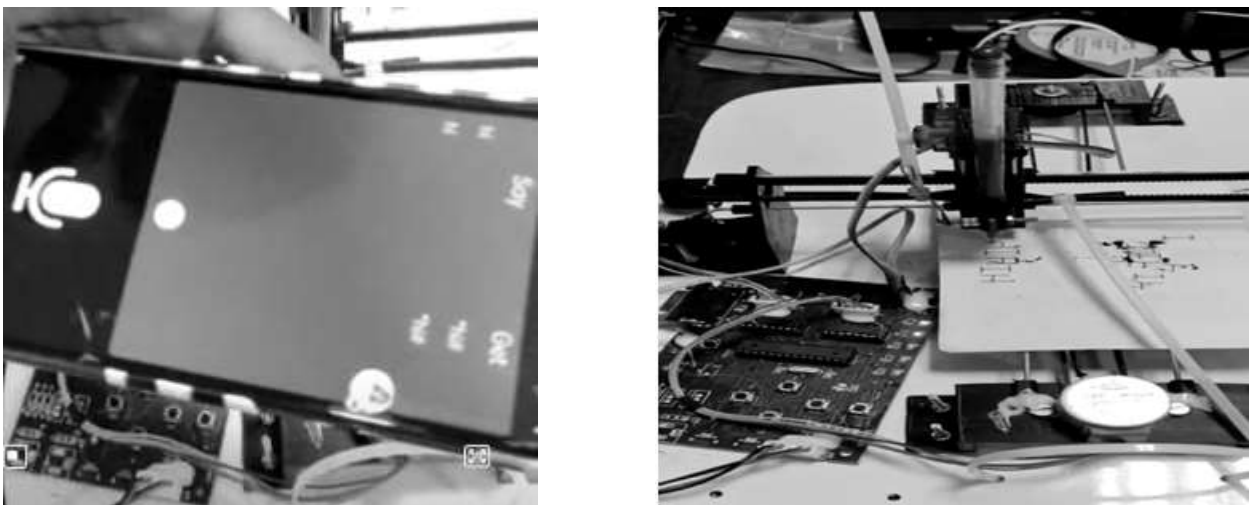


Fig 4 – Screenshots of the Implementation

VI. CONCLUSION

In this paper, our approach is to implement a robot that can write a medical prescription what doctor says, so that the patients and the pharmacists can understand what is written in the prescription. We present a method to design rapid and fluid movements of a universal robot to perform robot writing mimicking the kinematics and trajectory of human handwritten signatures. In this proposed work, we have used raspberry pi working on Raspbian OS. As the communication is done with the help of internet so limitation of range of operation does not arise and one can easily monitor as well as control the activity of the robotic unit.

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