DESIGN OF SMART WRITING ROBOT FO MEDICAL PRESCRIPTION USING WIRELESS COMMUNICATION

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Abstract: Nowadays when a patient is consulting a doctor they are writing the prescriptions manually in a prescription pad which is not readable by normal people and the patient is supposed to carry this document to consult another doctor or to bring medicines from pharmacy they have to consult the doctor again if they have lost the prescription project. In this era of digitalization doctors are still following this manual method of prescription writing. We are proposing a system which can transform this process into a digital, efficient and transparent way. In the proposed system when doctors are writing the prescriptions the written text will be converted into digital readable from by comparing medicine database with the help of a Personal Digital Assistant(PDA), and this prescription will be saved in to patient's medical account in cloud. When patient is going to brought medicine they don't have to carry a physical prescription with them all they have to do is to give unique identity by which pharmacists can get the prescriptions. Also when a patient is visiting a new doctor by referring patients medical account the doctor can know all the medical procedures patient has gone through. Patients don't have to worry about losing the prescription.

Index Terms – **Aurdino Microcontroller, MPLAB IDE,C18 Compiler**

1.INTRODUCTION

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 project we have came out with an robot prescription writing. Robot is a machine that designed to work automatically and it performs one or more tasks with speed. In our project we have an 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 in order to rotate the pen.

It is commonly known that doctors have illegible handwriting. The writer usually knows what is written, but when other parties are involved they often have problems with reading and interpreting the text. The following quote stresses the problem with illegible handwriting: 'Doctors' sloppy handwriting kills more than 7 000 people annually. In this project we are trying to resolve this problem by recognizing doctor's handwriting using handwriting recognition and converting it into legible format by using a hardware device, that hardware device called PDA. Also we are trying to store all their prescriptions in a central storage to make

sure that no medical details are missed , it also help patient that prescription is not necessarily carried also it cannot be forged. Doctor can get the history of medical details directly from the system. Pharmacist can get prescription directly from the system. The Patients can also see their medical reports and laboratory details as well. By this system doctors are using a digitization device like PDA to write the prescription,

The objective is to yield the best textual (Unicode) interpretation of a given sequence of handwritten strokes, as the domain (set of all medicines) is known and comparatively small, system will try to look for a match in the medicine database. Once found it can be uploaded to cloud after verified by the doctor. This will be available in every pharmacies worldwide and authorized pharmacies can get the list as per customer's request. In current scenario hospitals are trying to change into e-prescription but major challenges in this area is the handwriting recognition of doctors. In this project we are discussing about the possibilities of implementing this system.

2. EXISTING SYSTEM

Mr.Moises Diaz, Mr.jose j. Quintana, Mr.kanstansin Miatliuk, Mr.adam Wolniakowski and Mr.Miguel A.Ferrer [2] proposed to design rapid and fluid movements of an universal robot to perform robot writing and mimicking both the humans kinematics and when signing the trajectory.

Mimicking human handwriting is a challenge for robots. To perform the task, on-line human signing standards after that and robot signatures area analyzed and compared, and the degree of signatures correlation is defined. Finally, recommendations of robot motion improvement are given.

Mr.Rayan Haidar, Mr. Roger Achkar, Mr. khodor Ghayad, Mr.Rana Al Hajj and Mr.Sawsan Saleh [1] demonstrated how artificial neural networks ANN is used to develop a system that a can recognise handwritten english medical prescriptions using the deep convolution recurrent neural network to train this supervised system, input images are segmented and processed.

Mr.Paul Voigtlaender, Mr.Patrick Doetsch, Mr.Hermann Ney [5] released an efficient implementation that greatly reduces the training time by processing the input in a diagonal wise fashion. They have used this implementation to explore deeper and wider architectures than previously used for handwriting recognition and have showed especially the depth plays an important role .There output state of the art results on two databases with a deep multidimensional network.

Mrs.Monika A. Shejwal, Mrs.Sangita D. Bharkad [13] they have presented the model based on the image processing algorithms that are used for the segmentation and extraction of characters from curved text lines from the document images. Then the algorithm performs the curved text segmentation using the x and the base line. The words in the document image are then identified and the bounding boxes are plotted with the words around. The properties of connected components are used for segmentation words. Thus, this algorithm has achieved a good accuracy for extraction of the characters from curved text lines.

Mr.Moises Diaz, Mr.Miguel A. Ferrerand Mr.Jose J.Quintana [8] have proposed a set of function based features for dynamic signature verification. They were inspired on the human stance and the variations in the angles of the arm joints. When signing. They propose to convert the trajectory altitude from an online signature into the required sequence of an robot poses to reproduce such signature. Then, the new robotic sequence are corrected in an online automatic signature verifier.

3. PROPOSED SYSTEM

ARDUINO MICROCONTROLLER

Arduino Uno board is a good choice for students and educators. With the Arduino board, one can microcontroller, write programs and create interface circuits to read switches and other sensors, and to control lights and motors with very little effort. It is a microcontroller board based on the ATmega328P. It consists of 14 digital pins, 6 analog input pins, 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything that is needed to support the microcontroller. Here the Arduino uno is used to interface the program.

ADAPTER

An adapter will enable connection of a power plug, it is used in one region to a AC power socket and it is used in another by offering connections for the contact arrangements, while not changing the voltage. An AC adapter is also known as recharger, is a small power supply that changes household electric current to low voltage DC suitable for consumer electronics. Some modify power signal attributes, while others adapt the physical form of one electrical connector to another. For computers and other

items, serial port adapter enables connections between 25and 9 contact connectors, but does not affect electrical power and signalling related things. Here the adapter is used to supply the power to the kit. It is used to convert 220V into 50V.

5*1 KEYPAD

A keypad is a set of buttons that are in a block or pad form to perform a specific task. It contains five keys that are arranged in matrix form. The pulses from the microcontroller are used to switching keys in a keypad. To make the keypad work properly, pull-down resistors have to be placed on the microcontroller's input pins, in order to define logic state when no button is pressed. By joining zeros and ones at the output pins, it will be known which button is pressed. It requires only one power supply for switching. The keypad can be used for a multi input switching. In our project the keypads has overall 5 keys in which two keys are used for the movement of the pen and the remaining two keys are used to move the writing pad in the X and Y direction.

STEPPER MOTOR

This usage of the stepper motor is to drive a 28BYJ stepper. The stepper can be stopped when the stop button is being pushed. It can also be changed to control the stepper in order to rotate it in counterclockwise or clockwise .Here the stepper motor is used to move the writing pad from left to right.

SERVO MOTOR

The servo motor is a Tiny and lightweight motor with high output power. Servo motor can rotate approximately 180 degrees, and works just like the standard kind but smaller. One can use any servo code, library to control these servos. Here the servo motor is used to move the pen up and down direction.

HC-05-BLUETOOTH TO SERIAL PORT MODULE

Bluetooth module is used for the serial port, it is designed only for the transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth. Modulation with complete 2.4GHz radio transceiver and baseband. Here the bluetooth is used to transfer the data given by the receiver to the transmitter.

TRANSMITTER SECTION

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 1.2.In transmitter section it contains a Bluetooth device named HC-05 that helps to connect to the receiver Bluetooth For transmitting the data, First the user have to store the required data in Bluetooth voice app.Then the receiver receives the data from the transmitter section. Thus it recognizes the data and sends it to the receiver section. Then the receiver starts doing its work.

RECEIVER SECTION

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.

4.BLOCK DIAGRAM
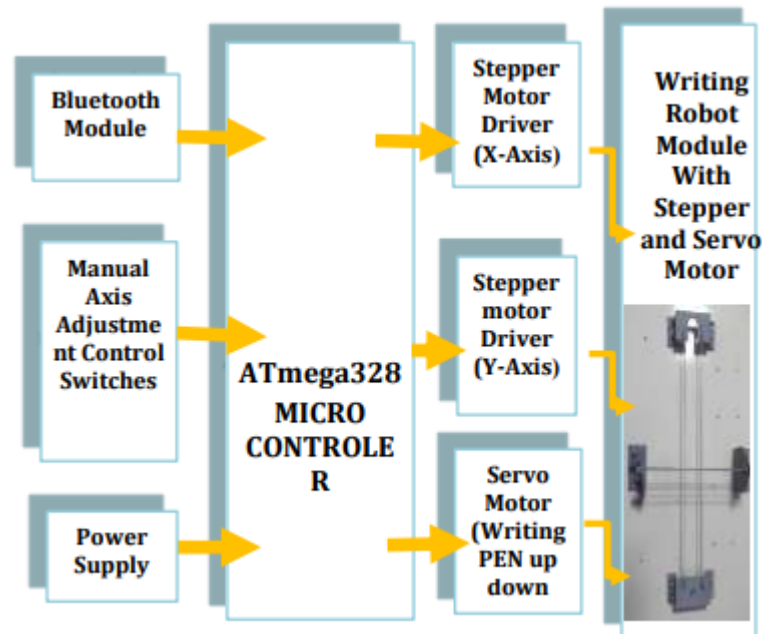
5.SOFTWARE DESCRIPTION

The software tools which are used for the implementation are listed below, they are

MPLAB IDE

C18 COMPILER

MPLAB integrated development environment is a comprehensive editor, project manager and design desktop for application of development of embedded design using Microchip PIC MCU and PIC DSC.

MPLAB is a window operating system software program that runs on a PC to develop application for microchip microcontroller and digital signal controller. It is called an integrated development environment or IDE, it provides a single integrated environment to develop code for embedded microcontroller.

Embedded C language is used in MPLAB IDE. Embedded C is a set of language extensions for the C programming language by the C standard committee to address commonality issues that exist between C extensions for different embedded system. Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations.

- Code speed is governed by the processing power, timing constraints

- Code size is governed by available program memory and use of programming language.

The Embedded software is associated with each processor which acts as a brain in each embedded systems. If hardware forms the body of an embedded system, embedded processor acts as the brain, and embedded software forms its soul. It is the embedded software which primarily governs the functioning of embedded systems. Goal of embedded software programming is to get maximum features in minimum space and minimum time. Embedded software needs to include all needed device drivers at manufacturing time and the device drivers are written for the specific hardware.

The MPLAB C18 compiler is a free-standing, optimizing ANSI C compiler for the PIC microcontroller unit. The compiler deviates from the ANSI standard X3.159-1989 only where the standard conflicts with efficient PIC micro MCU support. The compiler is a 32-bit Windows console application and is fully compatible with Microchip's MPLAB IDE, allowing secure level debugging with the MPLAB ICE in circuit emulator, the MPLAB ICD 2 in circuit debugger or the MPLAB SIM simulator.

6. CONCLUSION

In this project, our approach is to discover a robot that can write a medical prescription what doctor says in mobile app, so that the patients and the pharmacists can understand what is written in the prescription. now the patients can take the correct medicine and the pharmacist can give the right medicine.

In our project the writing speed is slow since we use the servo motor. So, In order to increase the speed we can use the DSP(Digital Signal Processing) in future if needed. Even it can be used for handicapped people during their examination. The people who can't write can use this instead of depending on some other people.

7. RESULTS

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.
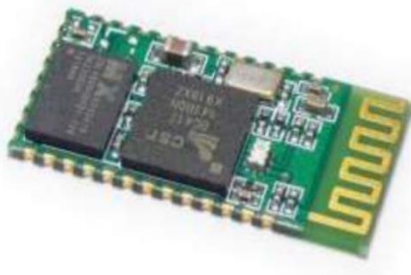
Bluetooth module
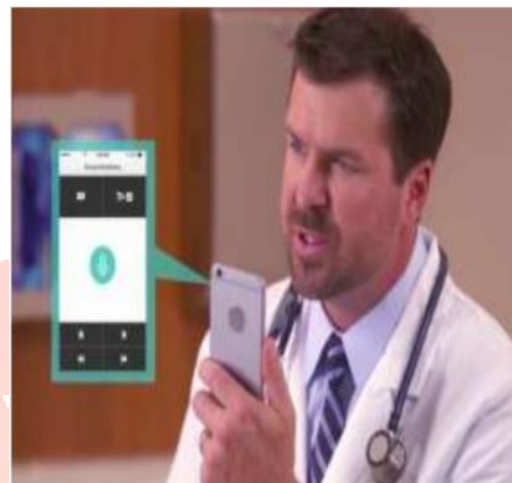
commanding through voice

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