Voice Controlled AutomaticWriter

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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 writing when signing and the trajectory. 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 useof Latin abbreviations and medical terminology that most peopledon't understand. To perform the task, on-line human signing standards are created first. Robot writing task is performed usingthese standards after that and robot signatures are acquired as aresult. Finally, recommendations of robot motion improvement are given.

I. INTRODUCTION

Mimicking human functions of handwriting is a challenging task for robots. The task is also actual for biometrics which deals with the measurement and statistical analysis of people's physical and behavioral characteristics/traits. Even for a man, it takes a long time to learn how to manipulate a pen to perform rapid and fluid writing movements to produce appropriate smooth sequences of letter signs such as in a human signature. Nowadays, there are many approaches employed in robotics to mimic human writing. The approaches relied on precise position-controlled robots are among them . Such robots employment guarantees that the robot pen will be in contact with the writing surface but requires fine calibration of the drawing pad. In this work, we use universal robot aimed to transfer natural human kinematics and trajectories when writing while exploiting contact with a writing tablet, Wacom Intuos Pro tablet in our case.

Many of us are wondering how a robot functions, what types of technologies are used in a robot and why we need a robot in our life. The aim is to provide the reader with a clear, simple explanation of robotics. The information is directed towards engineering students, and engineers who are interested in a robotics. In the beginning, you will find a general idea and the development of robot technologies, some applications of an industrial robot and a non-industrial robot. How robotics has developed in the last few decades and how it begins to play a vital role in our industrial life. The topic of the thesis is to summarize and cover the most important areas of a robotstructure and design. My target was to provide the reader withan easy, simple way by using a lot of different pictures, drawings and mathematic examples to make the subject of robotics simple to understand and easy to follow step by step from the basics until the most complicated forms. Robotics study becomes an extremely large field because it contains a huge amount of different technologies, but I have covered the most important areas. This kind of automation cannot handle product design variations, mass production for example; conventional machinery, packaging, sewing and manufacturing small parts. Adjustability is possible but it can only handle specific tasks with no possibility of changing its own task. These machines can be seen in our homes (washing machines, dish washers, etc). Programmable Automation: This form of automation began with the arrival of the computer. People began programming machines to do a variety of tasks. It is flexible because of a computer control, can handle variations, batch product, and product design. Autonomous (Independent): Endowed with a decision making capability through the use of sensors. A robot belongs to this kind of automation and it is a combination of microprocessor and conventional automation systems which can provide a very powerful system. Its high level machinery capabilities combined with fault recognition and correction abilities provided by highly evolved computer systems. This means it can carry out work traditionally carriedout by humans. Examples of existing autonomous systems areanimals and human beings. Animals when they see food they move toward it using sense of smell or they escape when they react against danger due to senses of fear (sensors). 3 Human beings are the highest level of autonomous systems because they think and they can change plan at any moment due to their high intelligence. Robots cannot reach the same high level as humans because they are programmed to do certain tasks according to certain factors which are completely programmed by human beings, but they have no possibilities to change planlike humans or plan new things unless the programmer programs them to change the plan. Because of high development of machines, sensors, actuator, digital electronics and microprocessor technology it became possible to create a robot which is autonomous

II. EXISTING SYSTEM

The existing system for medical prescription writing primarily relies on manual handwriting by healthcare professionals, which can be prone to errors due to illegible handwriting, inconsistent prescription formats, and variability in prescription writing practices. This can lead to medication errors, adverse drug reactions, and patient harm. In some cases, electronic prescription systems are used, where prescriptions are generated electronically and printed. However, these systems may still require manual input from healthcare professionals, and the legibility and accuracy of prescriptions can still be compromised. Furthermore, the existing systems may not provide real-time feedback on prescription accuracy or have the capability to mimic the fine motor skills and handwriting capabilities of a human hand, which can impact the quality and reliability of prescriptions. In existing system a Microphone is fitted to the robotic arm which acts as the input to for the speech signal from the user. The microphone receives the audio signals (speech signal).i.e. the word pronounced by the patient and converts it into an electrical form. A PC sound cord transfers this signal to a MATLAB TOOL BOX where the signal acquisition process takes place. Then this information is matched with the preprogrammed DSP algorithm, where signal text conversion takes place. The microcontroller unit converts the text signalfrom the MATLAB toolbox into mechanical action.

III. PROPOSED SYSTEM

The writing robot makes the written prescription chit about the patients with the help of wireless communication. The movement -Code file created by the help of Inkscape 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 sending the data to controller block is interfaced with motor driver unit along the 25 DAC provides the pulsewidth signal to motor unit where it is been processed and final output is written and displayed on the paper from the output unit.

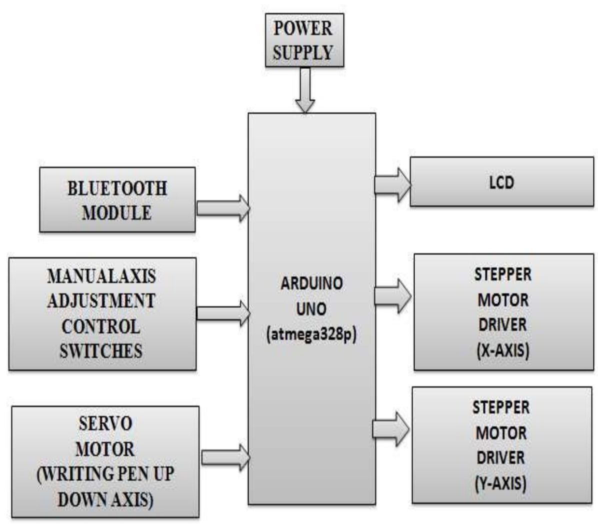

Fig.1. Block diagram

IV. RESULT AND DISCUSSION

Now run the proteus, and if everything goes fine, to press run button and the proteus software running .We have to run the aurdino by using Digital (PWM) and next we haveto click the virtual terminal.

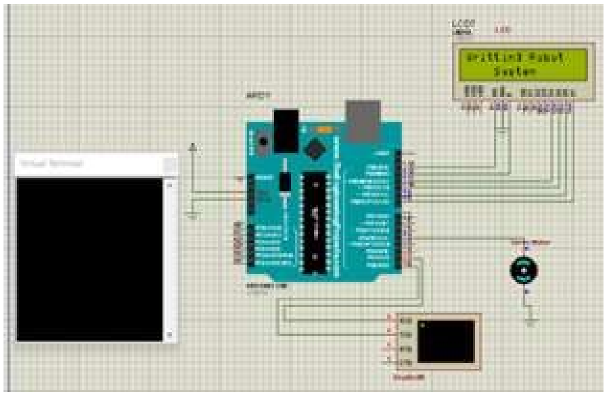

Fig.2. Simulation Results

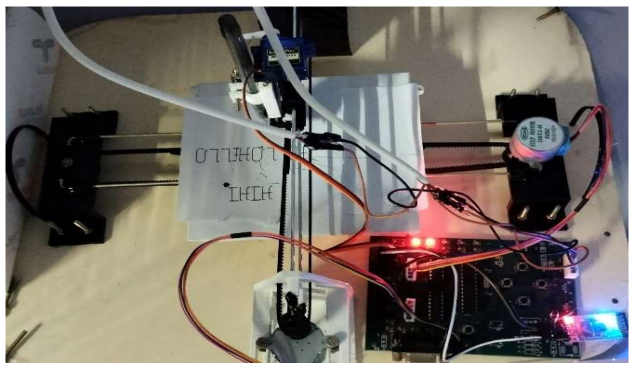

Fig.3.Hardware Implementation

Atmel 8-bit AVR RISC-based microcontroller combines 32 KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2 KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byteoriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watch dog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. The device achieves throughputs approaching 1 MIPS. Today the ATmega328 is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro controller is needed.

The hardware implementation of Stepper Motor(X-axis) works Adjusting Perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno and Arduino Nano models. The name says it all on this one. An ATmega328 in DIP package, pre- loaded with the Arduino Optiboot (Uno 16MHz) Bootloader. This will allow you to use Arduino code in your custom embedded project without having to use a 5V supply, and a serial connection. If you are not comfortable doing this, we recommend purchasing the Arduino Uno board that has all of these built into the board. Atmel's 48 ATMega328 8-Bit Processor in 28 pin DIP package. It's like the ATmega168, with double the flash space. 32K of program space. 23 I/O lines, 6 of which are channels for the 10-bit ADC. Runs up to 20MHz with external crystal. Package can be programmed in circuit. 1.8V to 5V operating voltage. This is the new Arduino Uno R3. In addition to all the features of the previous board, the Uno now uses an ATmega16U2 instead of the 8U2 found on the Uno (or the FTDI found on previous generations). This allows for faster transfer rates and more memory. No drivers needed for Linux or Mac (inf file for Windows is needed and included in the Arduino IDE), and the ability to have the Uno show up as akeyboard, mouse, joystick, etc.

V. CONCLUSION

In conclusion, the design and development of a dual-axis controlled robot for medical prescription writing offers a promising solution to improve the prescription writing process in the medical field. The system's robotic arm with two axes ofmotion, specialized end-effector, vision system, control system, and user interface work together to automate the prescription writing process, reducing the risk of errors, improving patient safety, and increasing efficiency. The system's benefits include improved prescription accuracy, increased efficiency, enhanced patient safety, and accessibility for medical professionals with physical disabilities. By automating the prescription writing process, the system has thepotential to reduce prescription errors caused by illegible handwriting or incorrect dosages, save time for medical professionals, and provide an additional tool for those with physical limitations. We present a method to design rapid and fluid movements of a universal robot to perform robot writingmimicking the kinematics and trajectory of human handwrittensignatures.

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