Development of Speech to Text Machine

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Abstract: A demand for plotter machine has arrived because of the need, as it saves lot of time of typing and makes its operation more users friendly. By the mid of 1980 IBM's Fred Jelinek's team invented a voice activated type writer called Tangora. In this project, the innovative idea is to convert human speech into textual matter. The use of technology in education has become too indispensable. With the advancement of technology and requirement for plotter machines in educational institutions like blind student educational institute, handicapped and temporary fractured people. With the help of Android application human speech is converted into G-code and through motor drivers the textual matter is plotted in a sheet of paper without any difficulties.

Keywords: CNC (computer numeric control), Stepper motor, Drivers (A4988), Servo motor (sg-09), Arduino Uno, Bluetooth module (HC-05).

1. Introduction

X-Y plotter, the scheming of two dimensional data on a rectangular co-ordinate system, the materials selected for this plotter by considering the cost and wide range of applications like servo motor and stepper motor, which can be differential through peak torque capability, cost, speed range to compromise the standard and application of the system. There are two drivers of stepper motor for sliding the gantries in the X-Y direction and servo motor for the movement of pen holder. The coding for CNC system is G-code programming. G-code is the generic name for a control language for CNC machines. It is function to tell the machine to move to various points at desired speed. The instructions for 2D machine are given by the controller through Bluetooth which are already converted in the G-code form to move to various points at various points at desired speed, turn-on and turn-off, and also to control the spindle speed which are given by the G-code. There is an Android application (Bluetooth to g-code App) which converts spoken content into the G-code and via Bluetooth communication feed to CNC machine. G-code is supported by the part programmer to specify the co-ordinates of the point which are to be moved and providing the normal vector to the surface at desired point. The voice is input to this machine. At first user needs to convert speech into the G-code, these G-code conversions are done through bluetooth to G-code app then feed it to Arduino Uno controller through Bluetooth module. Arduino Uno with ATmega328P controls the overall motion of the motors. According to the instructions from the controller are sent to the motor drivers to perform particular task which was given by the user.

2. Objective of the project

- To develop a voice based plotter that could write on behalf of human with,
  - Much more precision,
  - Error free and
  - Much faster speed than normal human speed.
- To build a system that would help the Handicapped, paralyzed and blind peoples to write based on their voice commands without errors.
- To ease the lives of handicap, blind and paralyzed people.
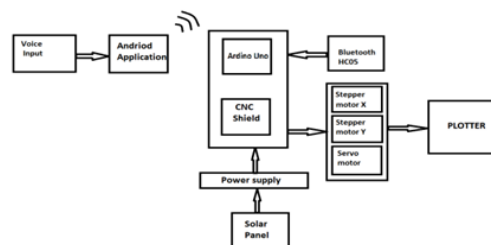- To develop human speech into textual matter.

Fig. 1. Block diagram

3. Methodology

The basic principle of CNC machine is that the motors can be controlled by computer through some software. In this project, machine has three motors those are two stepper motors which divides full rotation into a number of equal steps for X-Y plane and one servo motor which is angle precision for pen adjustment. Motor drivers(A4988) are used for the control of stepper and servo motors. The base for this plotter should be hard so that paper on which recognized words to be written, can be attached to it very easily.

The X-axis is attached to two plastic parts and made it to cut and constructed in vertical position. The Y-axis is placed in horizontal position with respect to plotter base and pen is gripped by servo motor to move up and down in the Z-axis which is free to move along 2D plane(X-Y). For stepper motors wiring, it will find a testing code for X and Y axis. If the stepper motors doesn't work properly, the corrections can be obtained by working combination by changing the cables between them.

G-code is a language in which people tell computerized machine tools how to make something. The "HOW" is defined by instructions on where to move, how to move and at what path to move. This code conversion can easily be obtained through the 'Bluetooth to G-code App'.
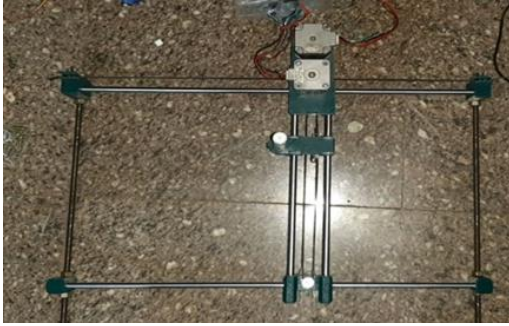
Fig. 2. Hardware model

4. Proposed output

Human voice is an input to the text machine, that input voice signals are converted into G-code through 'Bluetooth to G-code' Android application and is directly given to the controller via Bluetooth HC-05, according to the instructions from the controller to motor drivers the text is plotted on a sheet of paper by making use of stepper and servo motors.

5. Applications

Following are the applications of this project.
- This system can be used in any environments like school, office, home, court etc.
- Instead of stenographers we can use this machine.
- The handicap, paralyzed and blind people can use this machine to write their examinations.
- This machine can also be used as wall writer (Dynamic Notice board)

6. Conclusion

The project, Development of speech to text machine is a portable machine, that operates in two axis of motion i.e. X-Y axis. It uses pen to plot on a flat surface. This kind of portable machine we used for the purpose of Notice board writer. Its output is obtained with the help of stepper and servo motors, G-code plays a major role in the successful operation of the CNC machine. The only code which understands the CNC machine. With the help of 'Bluetooth to G-code App' this conversion became easy, through the Bluetooth module this code conversion is sent to the Arduino Uno controller which sends the commands or instructions to the motor drivers to perform the movement. And according to the task the data is plotted with the help of pen or chalk.

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