



## CNC BASED 4xi DRAWING PLOTTER USING ARDIUNO CONTROLLER

*Bharat Navnath Jadhav, Yash Santosh Renuke ,Uday Chandrakant Awalkar, Mukund Kishor*

*Diwani , Mr. A.J. Chinchawade*

Department of Electronics & Telecommunication, Sharad Institute of Technology Polytechnic, Yadav.(Ichalkaranji) Maharashtra, India.

### ABSTRACT

We are build this project in low-cost Arduino Mini CNC Plotter For X and Y axis we will use stepper motors and rails from two DVD / CD ROMs! Printing area will be max 4x4cm. Because it works with serial communication you can also use a Bluetooth module (like HC-06) to print your stuff wirelessly through your computer Bluetooth connection! With the advancement of technology, demand for Computer Numerical Control (CNC) plotter machines in Educational Institutions and Laboratories is rapidly rising. Low cost manufacture of Printed Circuit Board (PCB) has become a basic need in electronics laboratories, for mechanical engineering students and for electronics hobbyists. This paper will present an affordable model of a CNC plotter machine which is able to draw a circuit layout on PCB or any other solid surface using simple algorithm and available components. At first the user needs to convert any image file or text file into G code using Inkspace software and then feed it to the machine using Processing software. Arduino Uno with an ATmega328P microcontroller is used as the control device for this project. The microcontroller converts G-code into a set of machine language instruction to be sent to the motor driver of the CNC plotter

### 1. Introduction

Cost of the project and increase Reliability and Flexibility. In we have replace pen with mechanical tools drilling, grinding, machining etc. This will be used for soft material cutting or machining, laser cutting machine tool is also worked on this setup. We have reduced the cost, in the setup of mini CNC plotter machine. Mini CNC plotter machine is described as it is based on Arduino controller and CNC shield. CNC is computer numerical control machine. G codes are preparatory Function. G codes are pre-defining Function Associated with the movement on machine axes. In CNC Plotter Machine only G codes are used. G codes are giving the Direction to move the pen in X, Y, Z directions. Pen can be changed by tools of drilling, laser cutting tool, milling it can be worked, if it is made in large size.

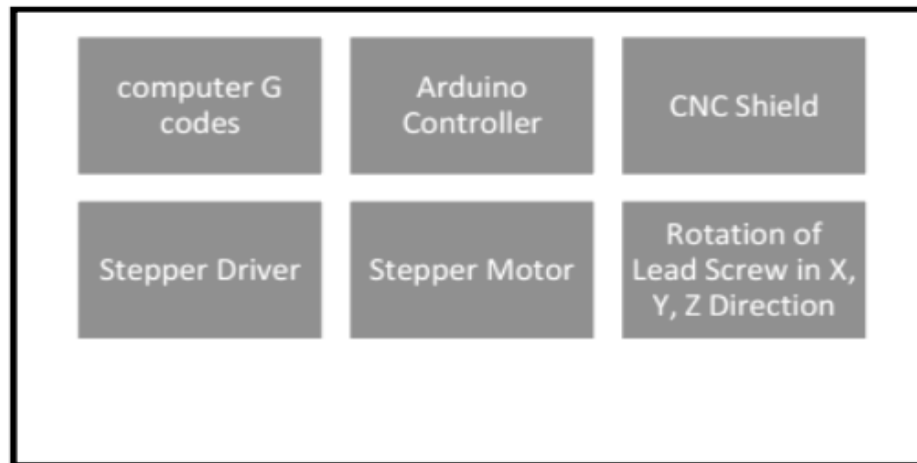
The aim of over is to make a mini CNC plotter machine which is capable to draw difficult design in paper or surface of metal, To cut it with a great accuracy. We have used 3 stepper motors with lead screw in Cartesian coordinate X, Y, Z directions. Stepper motor is convert digital pulse into lead screw rotations. Stepper drivers are used to give command to the system. The main aim is to fabricate a MINI CNC plotter Machine to draw an object with using G codes. We also work on to reduced. assembly of project MINI CNC PLOTTER

### 2. Methodologies

We have supply the current in Arduino with USB DATA cable to transfer Data from Computer to Arduino Board, Here we have used 3 Stepper Drivers to supply the G codes in Sequence to the stepper motors. Arduino will be mounted on CNC shield. CNC shield will be distributing the Current in the command of Arduino. CNC shield will be converting the command of G codes in digital pulse by Stepper motor. In X direction Stepper motor will be move left and Right ,Y direction stepper motor will be move in front and back direction, Z direction Stepper motor will be move in Up and down. We have made much difficult design via using this machine. The accuracy of this machines result is very high. So we have used in industry to reduce the cost of design printing and maintain accuracy level. Drafting and Scaling of CNC Plotter machine is very precious.

### 3. Implementation

Mini CNC Plotter Machine is worked on input as G codes of Design and Converting it via use of Arduino, Stepper Drivers, CNC Shield, Stepper Motor in to a Rotation of Lead screw. We have work on to maintain lowest cost of our project. We have design a simple construction of our project. This is easier way to use stepper motor with lead screw, CNC shield, Stepper drivers, Arduino Board, etc. The Setup of machine is flexible that's why it will be easily transported and Maintenance time is short. The basic diagram of CNC Plotter machine is shown in figure.

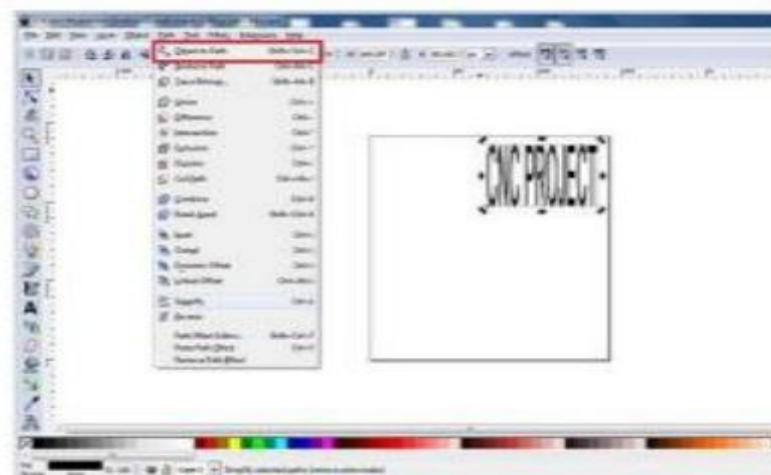


#### 4. Result

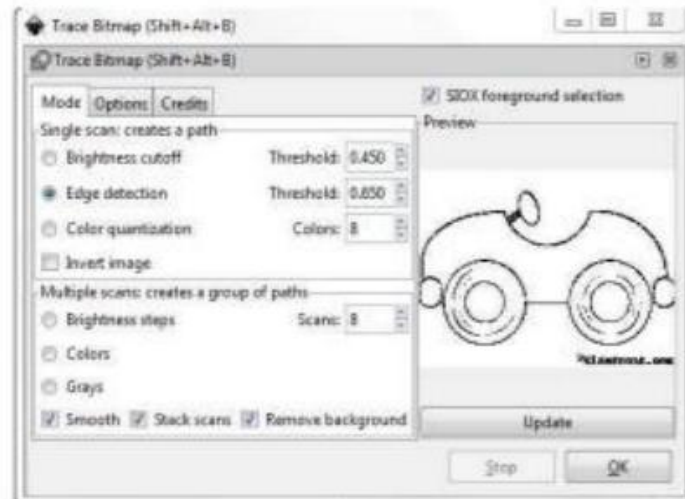
We had draw some diagram successfully using this machine

#### 5. Conclusions

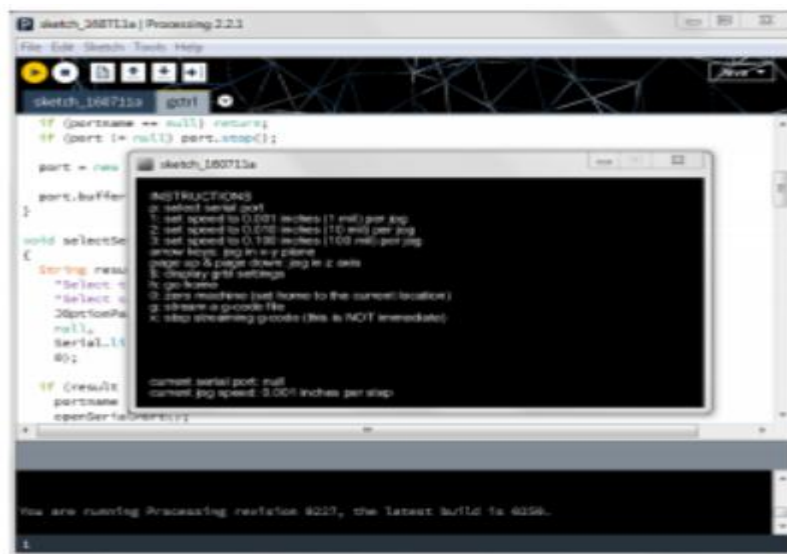
This wheelchair system is combination of mechanical, electrical and communications system. The main objectives were to design an android application that can direct the movement of a wheelchair, to develop the voice recognition mode and touch mode to help the elder lies and physically disabled people to move their wheelchairs independently and to provide the elder lies and physically disabled people with the ability to control the movement of the wheelchairs by using android smart phones. The system designed has undergone a few tests and successfully completed the basic performance. The objectives were achieved as the software and hardware implementation work well as expected. This system will helps the elder lies and physically disabled people to control wheelchairs with either a touch mode or voice recognition mode, therefore this success is to serve many people with disabilities.



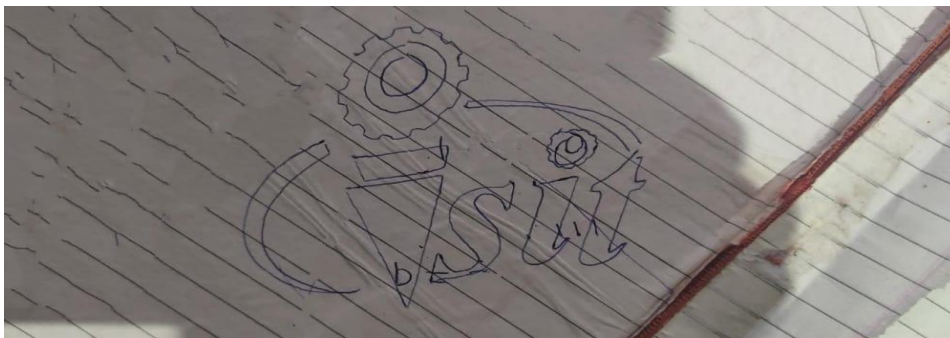
Create drawing on inkscape



Create G code of diagram



Send G-code to Arduino or control Plotter using processing software



Project Output

## REFERENCES

- [1] <https://create.arduino.cc/>
- [2] <https://inkscape.org/>
- [3] <https://processing.org/>