A New Developed Technique for Handwriting Robot

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Abstract*—The Handwriting Robot is a very adaptable machine, intended to serve a wide assortment of requirements for daily and particular graphics and writings. It can be used for practically any errand that may regularly be done with a handheld pen. The Handwriting Robot is performed based on the fundamental of Computer Numerical Control (CNC). This research concerns with controlling of motor driver shield for pen movement in x & y directions to the rotation of stepper motor by using an ARDUINO IDE microcontroller. The servo-motor is utilized for up and down movement of the pen in z-axis. Both of Inkscape and G-Code was utilized for generation signals from the drawing to be used by the Microntroller.

Keyword -- Two dimensional plotter, Handwriting Robot, Arduino

I. INTRODUCTION

Robotics is an improved technology and using for enhanced productivity, safety issue, minimising cost by saving time and money. In the field of robot technology, the handwriting robot is offering the works depending on the fundamentals of CNC machines that have important applications in various cutting processes and fabrication of electronic elements. To generate 2D printing, a complex circuit has to be designed and implemented that make the task costly process [1-5]. It involves the machining process that overlay a broad range of issues. To carry out this technique, an appropriate understanding and choosing of a particular machining technology is required. The nature of machining process that has to be selected to perform a given function is determined by the tooling accessories and machine tool [6-8].

The Handwriting Robot is an amazingly adaptable machine, intended to support a wide assortment of ordinary and particular graphics and writing requirement. Further, it be can utilized for practically any errand that may ordinarily be done with a handheld pen. It is useful for writing with fountain pens, indelible marker, and other writing tools to executes and deal with interminable assortment of utilizations. This writing machine is to quicken crafted by composing and time. What's more, it likewise creates exact writing and essays and deliver with high quality line [9-11].

Handwriting Robot is a very adaptable machine, intended to render a wide varieties of regular and specific required drawing and composing. It very well may be utilized for practically any assignment that may regularly be completed with the handheld pen. It enables you to utilize your PC to create writing that has all the earmarks of being high quality, finishing with the obvious appearance of utilizing a genuine pen (rather than laser printer) for addressing an envelope or signing with one's name. What's more, it does as such with accuracy moving toward that of a gifted craftsman, and — similarly as essentially — utilizing an arm that never gets tiredness [12-14].

To produce low cost Robotic arm for printing, an Arduino microcontroller with X-Y motion must be carried out. it is simple to utilize as it is tantamount to incredible PC with single board and the plan ventures for two dimentional printing is depended on the selected plotter being used. The software that is developed to execute efficient function of the CNC machines, involves C# programming language and .Net platform for user interface (UI) [15-17].

This investigation was done under the scope of delivering an Arduino based 2D plotter where mechanical parts were gathered, amassed and required mechanism was produced. After the coordination of the stabilizers into the mechanism that was made and the undertaking system is uncovered steadily, the equipment structure is finished by including the important electronic elements (motor drivers, stepper motor, servo motor, and so forth.). From that point onward, Arduino programming software was developed to empower the hardware to work. At the final stage, the created program was utilized to convert the 2D graphic into vectors on the paper. Designed and developed machine is comprised of several mechanical and electronic components. They have to utilize the Inkscape software to edit text and signature for example and furthermore CAMotics software to preview Eleksmaker software in order to control the hardware [16- 17].

II. MATERIALS AND METHODS

Essentially, Handwriting Robots are created in such way that they decline the reliance on incompetent pros and also skilled workers that are dealing with sophisticated machines and apparatuses. The present investigation incorporates with development of cheap handwriting robot. Inkscape software is utilized to generate the graphics as demonstrated in figure 1. The 2D image just as writing is created and uploaded by the Inkscape software and a G-Code is generated directly. The G-code has compaaibility with the utilized microcontroller to control the motors movements and make the required drawing as indicated Figure 2.

The program is congruent with Atmega168p by interfacing with Arduino IDE and the image that has to be drwan is supplied by the inkscape software which consequently generates the G code.

The real design is carried out by the Eleksmaker software as appeared in Figure 3. To perform this model, stepper motors are used and masterminded perpendicular to one another to adjust the motions of the Handwriting Robot. A servo motor is embedded with x-hub while the pen is joined to the shaft of the servo motor. External power supply of 220V is supplied for the driver shield that is settled to the Arduino panel. Figure 4 demonstrates the created Handwriting Robot. The required connections of servo & stepper motors are performed and the Micocontroller is inserted to the PC port.

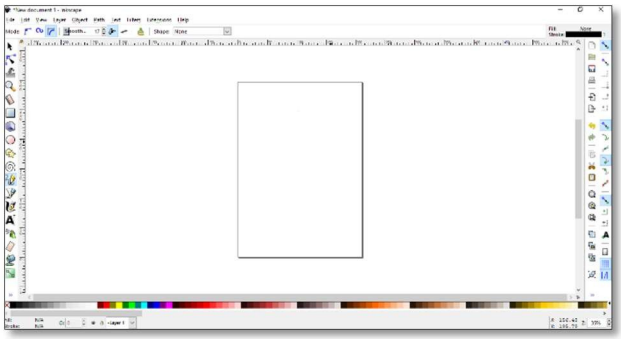

Figure 1: Inkscape software

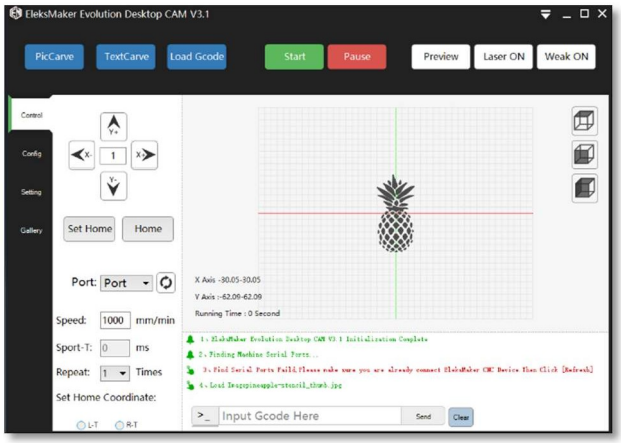

Figure 2: EleksMaker software

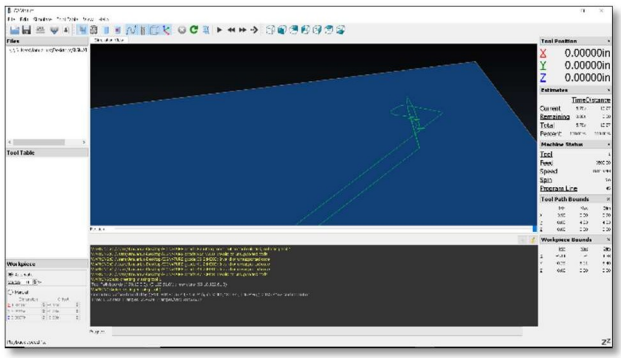

Figure 3: CAMotics software

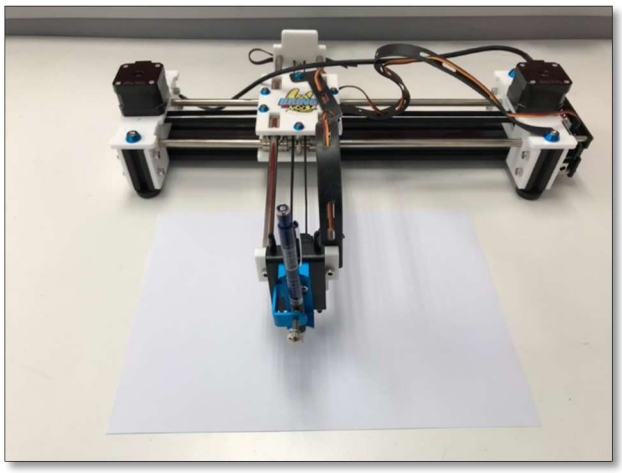

Figure 4: final design of Handwriting Robot

III. RESULT AND DISCUSSION

So as to check the feasibility of the presented design, simulations should be done on the robot [18-19]. This would likewise empower us to check the unwavering quality of the control mechanisms that was talked about above. A streamlined model of the robot was set up in Proteus programming [20]. The circuit simulation of movement of the car motor driver was effectively done as appeared in Figure 5. For trial validation, the framework was controlled from base station over Arduino utilizing the control software. A genuine model was created to test the possibility of this robot. The usage of Handwriting Robot is available mostly in all industrial sectors, ranging from low to high scales and there is an incredible flood in the interest of CNC software engineers.

The CNC framework is currently viably used mainly in modern manufacturing operation that could be depicted as a progression of developments and activities. The file creation of G-code is the core of a CNC platform and Inkscape program that has numerous highlights of graphic just as file generation of G Code, as it is free open source, it very well may be used successfully for cheap venture module.

The Arduino microcontroller IDE runs the G-Code and the motor for performing the particular graphic in X-Y directions. In this Handwriting Robot, the small robot plots the image with high adequacy and can likewise be utilized widely in carpentry businesses to execute different activities like routing. The Lettering and engraving frameworks are utilized by the CNC technology. Electrical sector, for example, CNC terminal zone, coiling winders, and soldering machines are immense utilizing the CNC innovation. It is additionally utilized adequately in enterprises for material removal and processing.

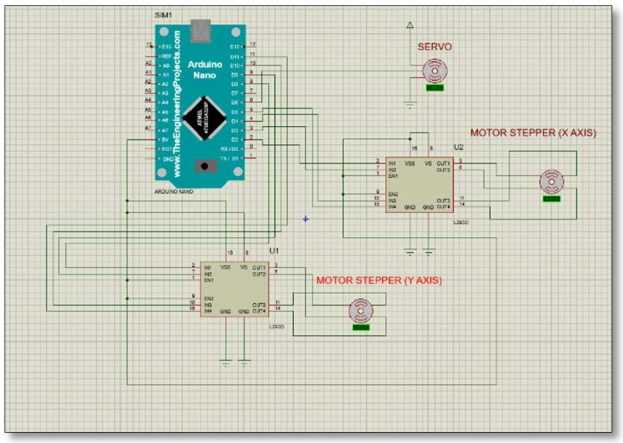

Figure 5: Proteus Circuit Simulation

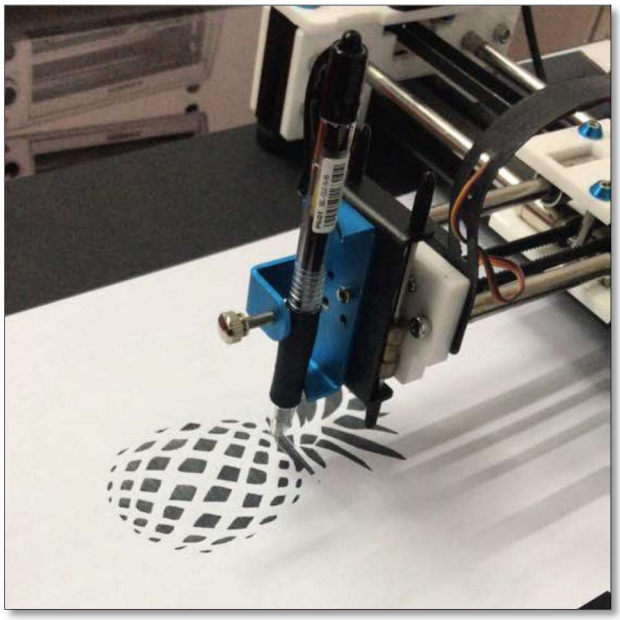

Figure 6: sample obtained by Handwriting Robot.

IV. CONCLUSION

New generation of robotics technology has been briefly presented. Handwriting Robot was effectively designed, constructed and checked in this study. This robot can render a wide assortment of ordinary and particular plotting & writing requirements. It tends to be utilized for practically any undertaking that may typically be done with a handheld pen. It enables to utilize our PC to deliver writing that gives off an impression of being handmaking, finsih with the clear and without mistakes appearance of utilizing a genuine pen (rather than a laser printer) for addressing an envelope or signing with one's name. What's more, it does as such with accurate approaching toward that of a gifted craftsman, and — similarly as essentially — utilizing an arm that never gets tiredness.

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