Automated Control Machining Implementation using Artificial Intelligence

Mechanical engineering department / College of engineering / Mustansiriyah university

By

ENG. Mohammed Farked Farhan

Asst. Prof. Dr. Suhad Dawood Salman

2022

The Aims of the Project

1- Design and construct of a machine that cuts surface using diode laser.

2- Reduction Noise through developing of an animated machine design.

3- Reduction noise on the stepper motor drive by controlling the programmability of the drive.

4- Add a new axis to the new design machine, which determines the value of depth of the cutting surface.

5- Using polymer materials in design of a machine, as well as the rubber material to reduce the vibration generated during the cutting process.

6- The machine aims to reduce the cost and time, in addition to obtaining high accuracy to the surface the product.

Abstract

- This project design and assesses of two of a modular machine, A prototype is built based on the chosen design, and tested for relevant properties of how well it performs. The results are then evaluated and possible upgrades are suggested
- Basically in laser engraving the laser beam burns the top layer of the surface to be engraved. The burnt area is left uncolored which makes it appear different from the surrounding surface, duration being decided on the strength of material to be engraved, This machine can engrave patterns of wood and thermoplastic sheets to produce desired shape and patterns.
- Vibration was measured and readings were taken for both the old and new machines. When changing the diameter of the aluminum bars used in the exterior of the new machine, the noise is greatly reduced.

Basic Component of the animated Machine

1- Acrylic materials (10mm & 4mm)

2- T-slotted Aluminum bars

3- Stepper motors

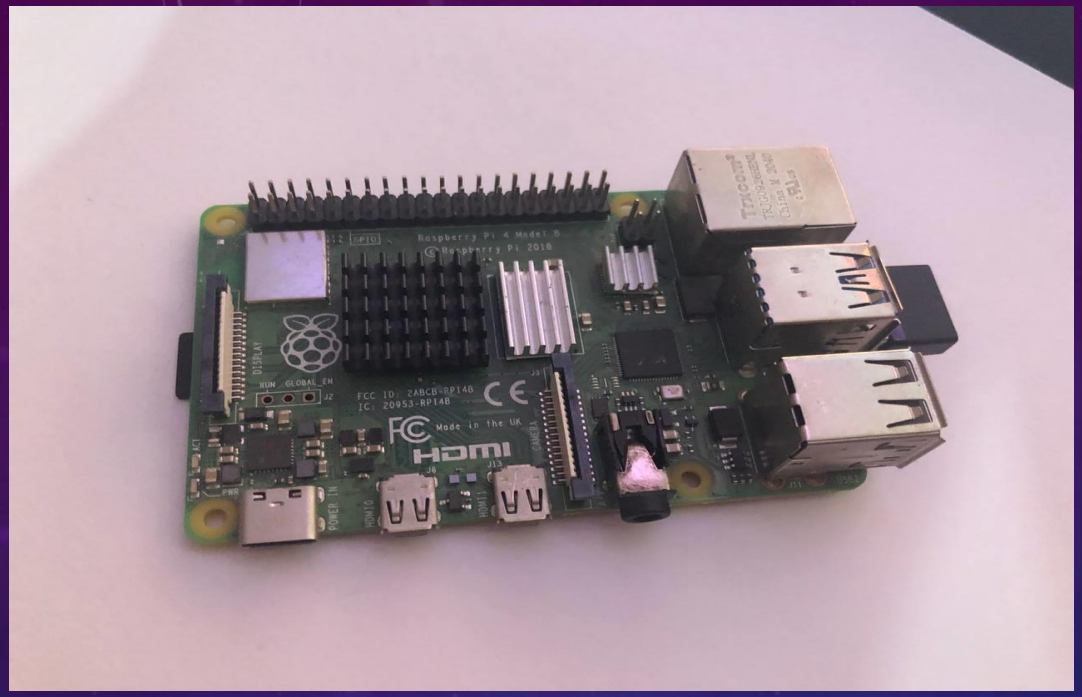
4- Diode Laser 5.5W

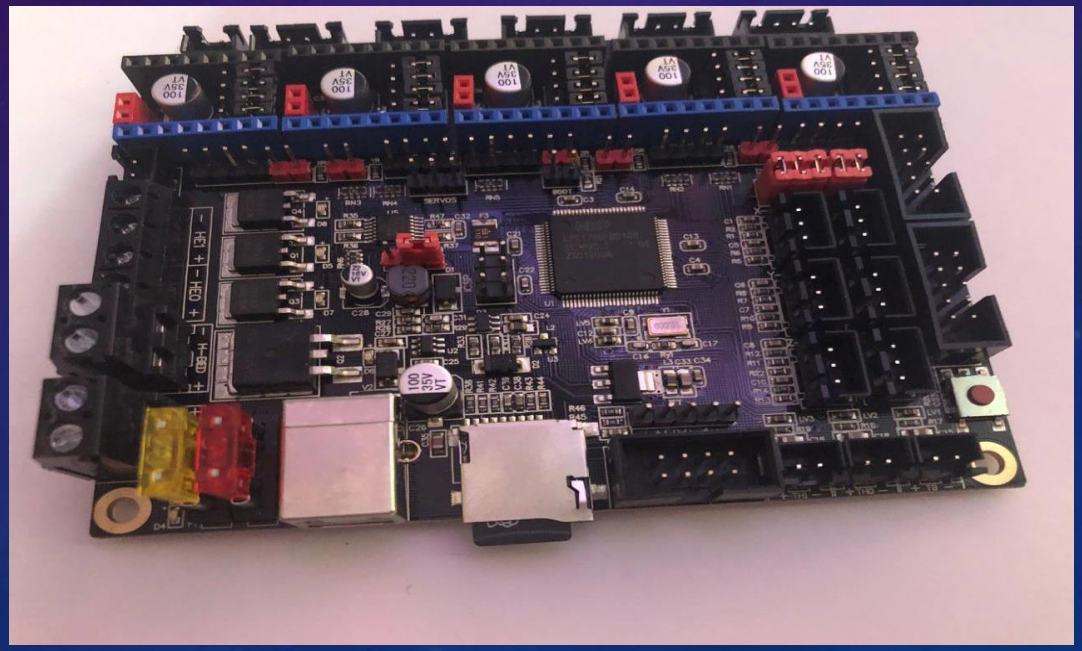
5- Card drivers , (Arduino Mega board & skr board)

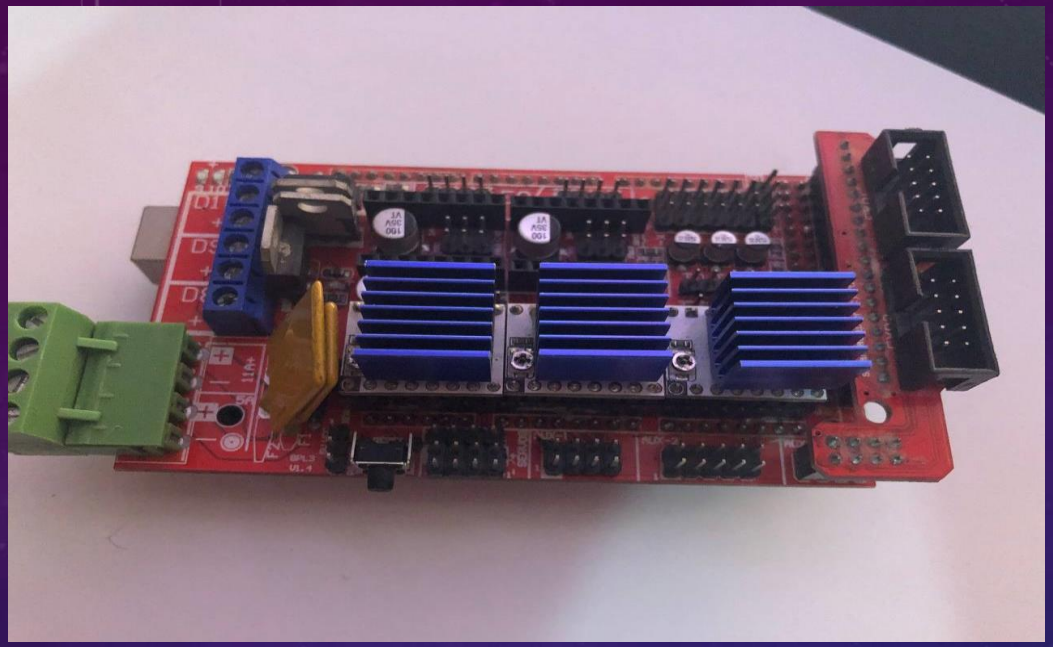
6- Power supply

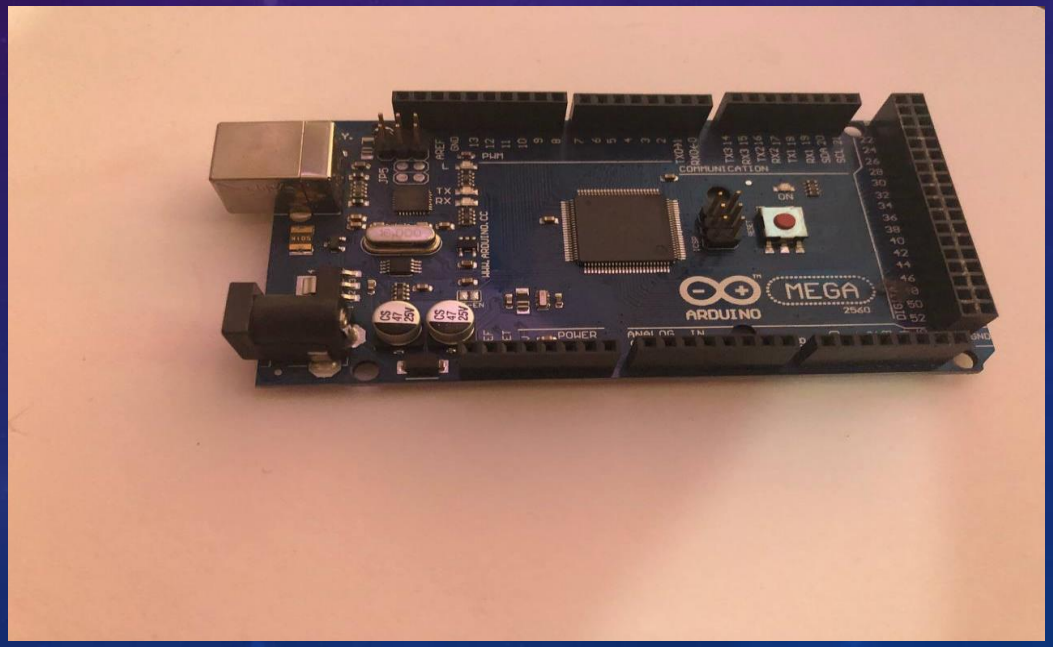
7- Software (Repetier - Host)

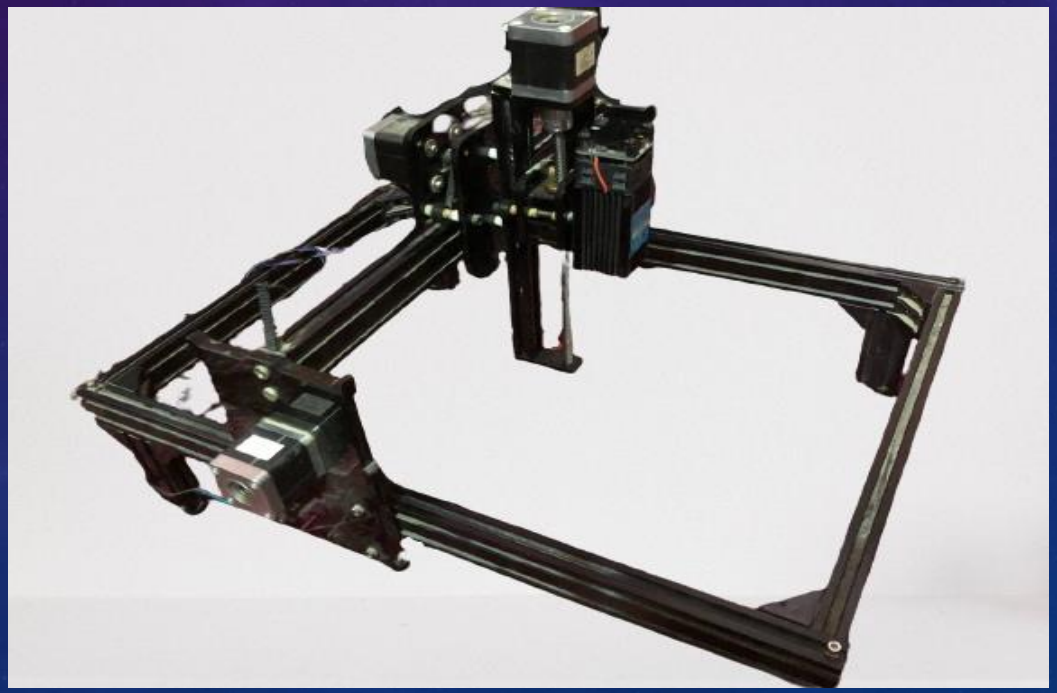
Main Parts of the animated Machine

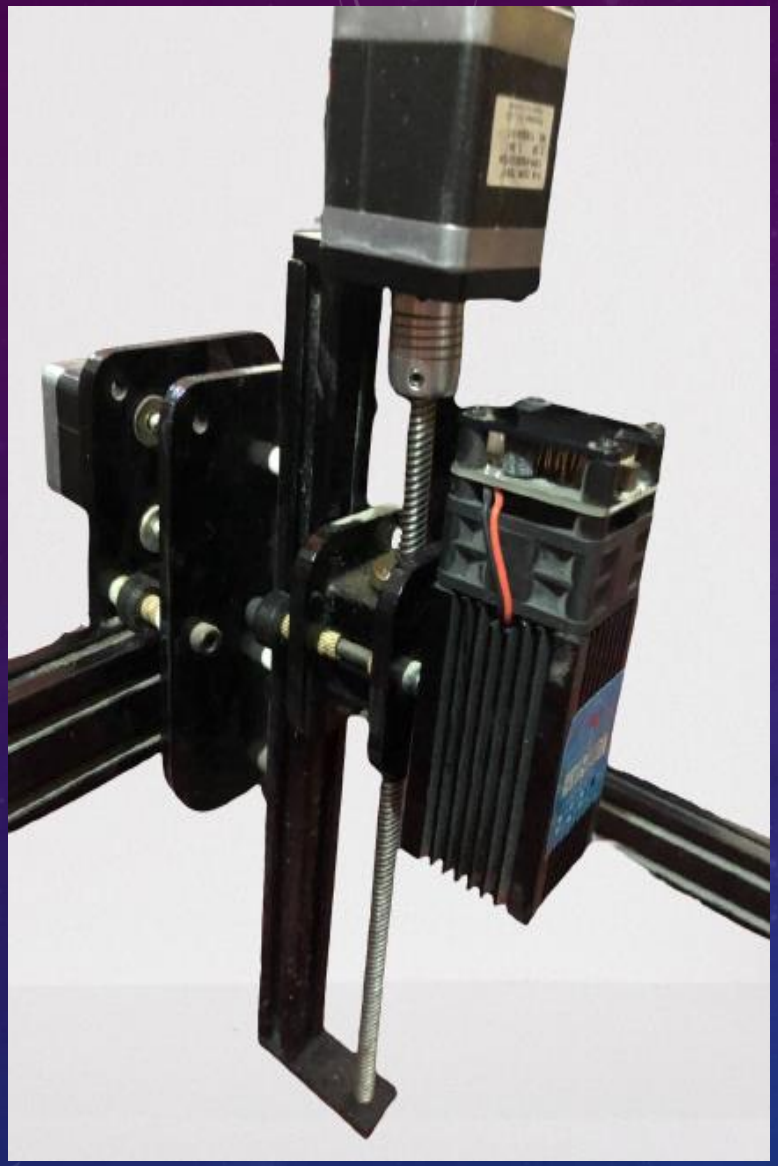

Raspberry Pi 4 Model B
Raspberry Pi 2018
FCC ID: 2ABCB-RPI4B
IC: 20953-RPI4B
Made in the UK
HDMI
POWER IN

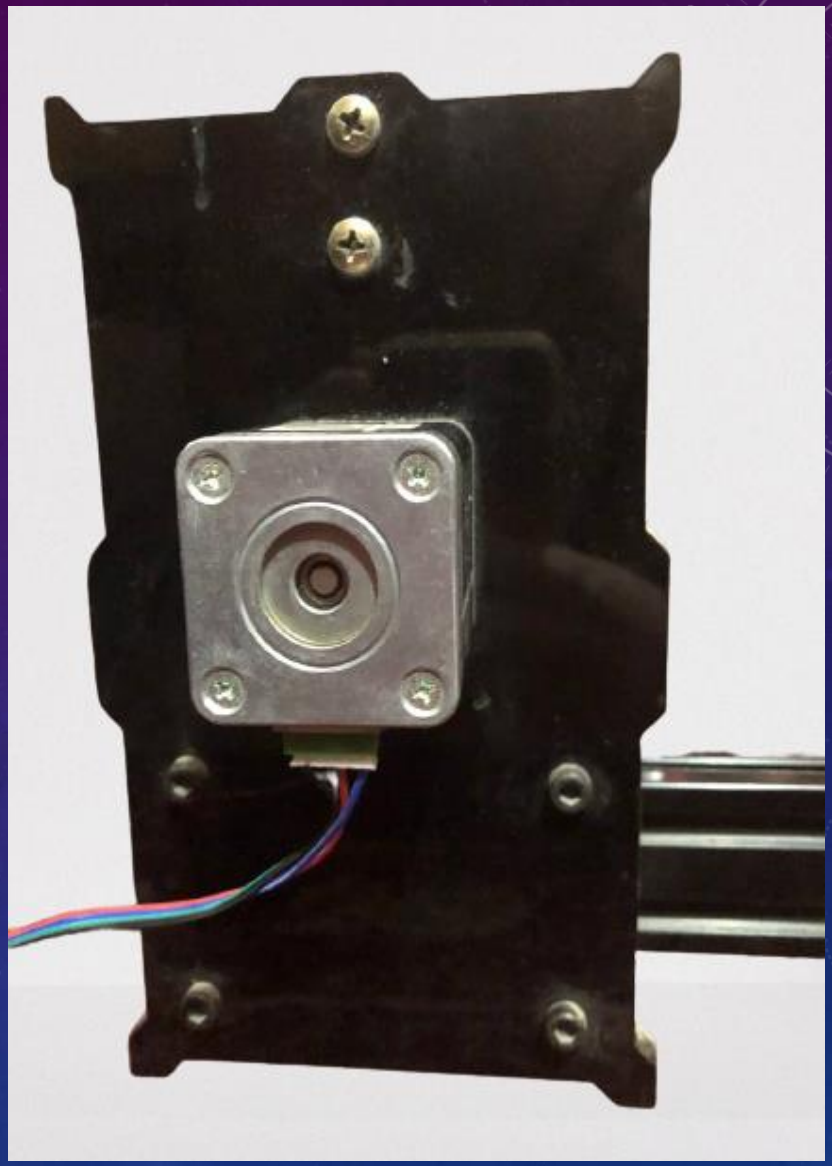





MEGA
ARDUINO
2560







SUCCESS STORY

- And the reason why this machine succeeded because of the low price, easy to build and the parts are available in the market and the unique thing about this machine is its frame we used 40*20CM aluminum bars And 10mm acrylic this will make the machine more stable with the prints and the engraving and we’re Gonna get a high quality prints.

Conclusion

The advantage of the animated machine is:

- Low weight.
- Easily transportable.
- Low cost
- Easy setup

The disadvantages of the animated machine is:

- Depth of penetration is low.
- Available for only soft material like wood or polystyrene.