

Bachelor's Thesis, Term Project

Control, Design and Fabrication for Foam Cutting Machine

Supervisor (s): (Assist. Prof. Dr. Eng. Amir Roushdy)

Instead of bits or lasers, the main tool of this machine is a hot wire, or a special type of resistance wire which gets really hot when current flows through it. The hot wire melts or vaporizes the foam when passing through it and so we can precisely and easily get any shape we want. **There is a Lab Engineer from the ARATRONICS Laboratory, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy.**

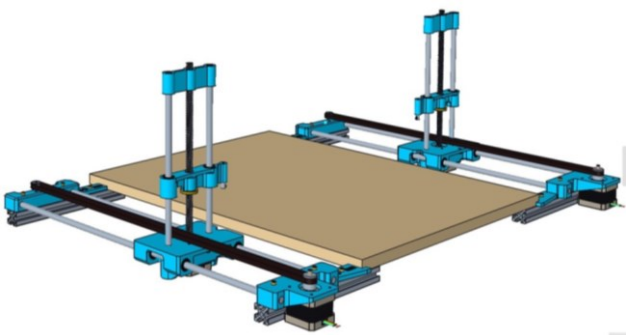


Fig.: Foam Cutting Machine using hot wire

Project description and objective:

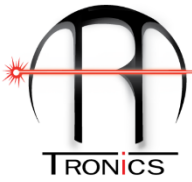
The project is similar to build a simple CNC machine starting from designing the machine, connecting the electronic components, programming the Arduino and also prepare your shapes, make G-codes and control the machine using free, open source programs.

Research focus of this project:

- Literature review on the project should be studied properly.

For more details please contact:

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- Not only, creating a software control system for the project but also the hardware.
- Experiments using the gadget and control system should be built properly.
- The outcomes must be documented.

Requirements:

- Passionate to learn more about CNC, automation and control.
- Prior mechatronic design expertise is desired like “SolidWork”.
- Enthusiasm for completing actual practical work with 3D printing staff (design fabrication and construction) and G-codes.
- A method of working that is both structured and self-contained.

General tasks of the project:

- The complete design for the machine is already exist and the ARATRONICS Lab Engineer will hand it to you from the first day.
- ARATRONICS will support you with the CAD Machine design on Solidwork. You, will adjust some parts on the design to fit with the motors and actuators in the local market.
- Fabricate the machine using 3D printer.
- Assembly all parts of the machine.
- Motion control study for the machine.

Other notes:

- A weekly meeting with the advisors will be required for this project, as well as weekly progress updates (*The meeting could be more than once during the week based on your progress and based on your achievements*).
- You should to be in the Lab two days per week (*It could be more than two days based on your progress and based on your achievements*).
- All reports must be prepared in the style of a research paper.
- The outcome of this research will be published in one of the coming international Conferences and , or Journal