

Bachelor's Thesis, Term Project

Automation, Production and Control for Filaments Produced with Recycled Bottle for 3D Printers

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

This project is about to develop an inexpensive process for recycling plastic bottle into printable filament for 3D printed. Also, it is about the important points for producing filament from recycled bottles as well as the settings required for it. **There is a Lab Engineer from the ARATRONICS Laboratory, guiding and directing the student with Assist. Prof. Dr. Eng. Amir Roushdy.**

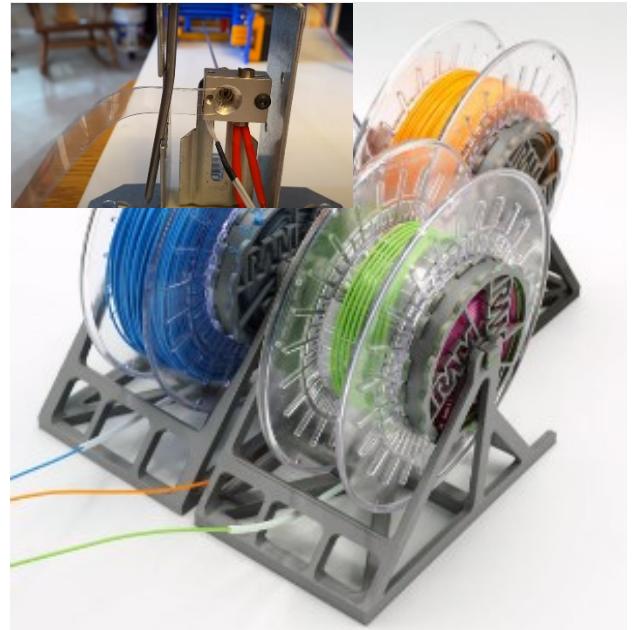
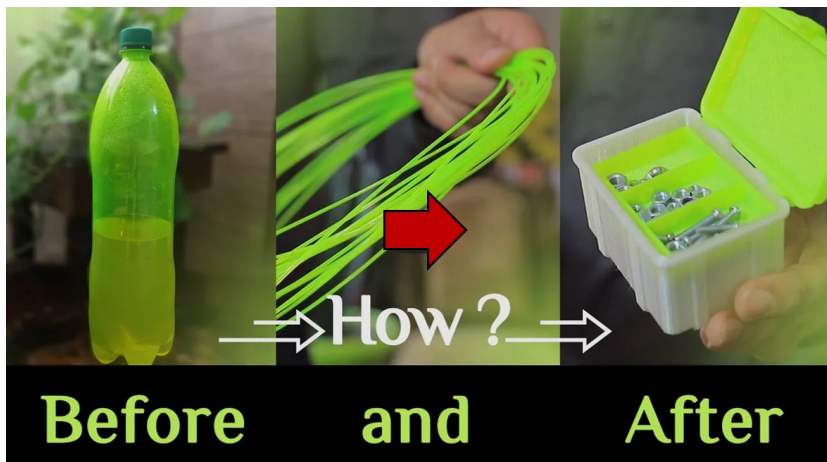


Fig.: Plastic Bottles to Filaments

Project description and objective:

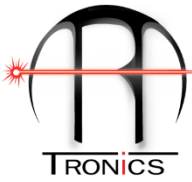
Most of the 3D printers are based on the fused deposition, which uses mostly Acrylonitrile Butadiene Styrene (ABS) and Poly lactic Acid (PLA) as the printer material. This current Project intends to design, construct and test a 3D printer filament making machine for small manufacturing units and colleges at low cost. The machine would be made from readily available materials sourced out from the local market, and the extruded filaments will be made from waste PET plastic. The filaments produced will be air-cooled and will be collected through a collection unit.

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 3D Printing design, 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).
- A method of working that is both structured and self-contained.

General tasks of the project:

- The complete methodology is already available in the ARATRONICS Lab, so we will discuss it from the first day to start the automation process for it
- Fabricate the machine/system using 3D printer.
- Assembly all parts of the machine.
- Changing the working variables and see the effect on the filament compared to the typical commercialized one.

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