Youth Connect

Youth Community Resilience to Climate Change in the Mekong Delta (Y-CoRe)

Plastic recycling machine (Re-filament)

Project background

Currently, society is concerned about plastic waste, particularly single-use plastics, which have become a serious environmental issue. The type of plastic used for bottled drinking water accounts for a significant proportion of plastic waste.

Moreover, from a technological perspective, there is currently no personal-level technical solution (i.e., one that individuals can directly use without the need for third-party intermediaries) that allows plastic bottles to be converted directly into other usable materials.

Project objectives

The function of a plastic filament extruder is to process raw plastic into soft and flexible plastic filaments that can be used in manufacturing processes.

Through stretching and elongation, the filament extruder helps create uniform plastic strands with the desired thickness and flexibility for various applications. The machine plays an essential role in producing plastic-based products such as 3D printing filaments, synthetic fibres, nets, films, and other components.

Project overview

Phase 1: Market research and orientation for plastic recycling, with a focus on single-use water bottles due to their compatibility with 3D printing plastic materials.

Phase 2: Study the plastic filament production process to ensure accessibility via open-source formats. Build the initial prototype and test different filament extrusion mechanisms and suitable temperature levels to produce 3D-printing-compatible plastic filaments (diameter: 1.75mm).

Phase 3: Based on the initial prototype, integrate a system for temperature control before, during, and after filament extrusion to enhance product quality and ensure material durability.

Outstanding outcomes

Through our research, we developed a technical solution to streamline the plastic processing workflow.

Our model was guided by plastic experts and employs cold thermal techniques to transform raw plastic into cylindrical filaments suitable for 3D printing.

Furthermore, we discovered that 3D printing technology can extend the lifecycle of plastic without the use of industrial chemical treatment methods, while still maintaining high material quality.

Team member's information

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