

Material properties of 3D printed parts

Context:

The association EPFL Xplore wants to develop a 3D printed parts recycling machine. After one year of development, a first version of the machine is ready and some filaments were extruded. Nevertheless, to improve the capacity, the reliability and the understanding of the machine and its parameters, a lot of work remains to be done. This is why we offer semester projects to EPFL students. The recycling process of 3D printing filament can be decomposed in the following steps: grinding, drying, extrusion, cooling and spooling.

Project description:

The aim of this project is to continue the work on filament by assessing the properties of 3D printed parts actually made with the filament produced by the recycling machine. This will require the production of filament (virgin, recycled and a mixture of the two) and the printing of dogbone, which would allow some of the mechanical properties of the final PETG to be assessed. Through these tests, it should be possible to optimise the recycled filament (e.g. ratio of virgin material to be added).

Furthermore, the student will be an integral part of the Wall-E Team, actively participating in its weekly meetings and working sessions. This collaboration will facilitate close interaction with other team members, and the student is expected to share their findings and progress with the team regularly.

Tasks:

- **Literature Review and Familiarization**
- **Filament extrusion of virgin and recycled material**
- **3D printing**
- **Material properties testing**
- **Optimization of recycled filament**

Requirements:

- Polymer properties
- Autonomous work

Contact:

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