

Projektseminar Wintersemester 2021/2022

# Design and development of a frugal recycling apparatus for polymer 3D printing feedstock.

## Background

3D printing (3DP), also called ‘additive manufacturing’, is revolutionising how products are designed and manufactured. On-demand production, product customisation and personalisation, and complex geometry creation are some of the few benefits that 3DP offers over conventional manufacturing. It has emerged as an enabler of local manufacturing, which can be used to precision-produce parts in smaller batch sizes, customised for the demands of the local needs. Many researchers and users of 3DP have developed recycling platforms that can be used to recycle scrap plastic bottles and convert them into 3DP feedstock in a cylindrical wire form - the filament - for extrusion-based polymer 3DP process. These plastic recycling systems are not an option in austere environments due to their energy-intensive requirements and high cost of set-up.

## Problem statement

In this Projektseminar students will explore potential option/s to address the challenges faced in prevalent recycling platforms for polymer 3D printing feedstock. Key focus in this work would be to replace some, if not all, steps in a commercially available 3D printing recycling hardware which follows a typical workflow, i.e. waste plastic collection-segregation- cleaning and drying-shredding-extrusion.

## Methodology

Students will be first introduced to the basics of polymer 3D printing, and a typical workflow of the Fused Filament Fabrication(FFF) process will be explained. After a few brainstorming sessions, and in consultation with the project supervisor, students must be able to develop their own solution to address the above mentioned challenge. The results must be documented and summarised in a final report. Towards the end of the Projektseminar students present their results in a 15-minute group presentation.



## Contact person

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