# 3D Printed hair

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# Problem and motivation

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- Features such as lion fur or human hair are difficult to model and fabricate with current 3D printing technology

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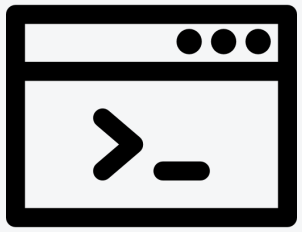
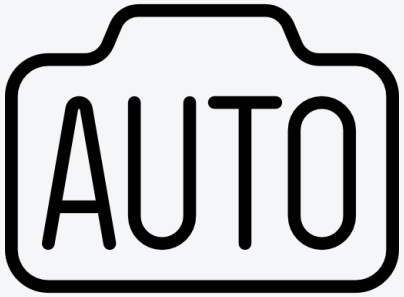
- Difficult and impractical to manually create thousands of small hairs using CAD software



# Problem and motivation

- Our aim is to quicken the hair generation process for 3D printing by automating processes such as the generation of the hair fibres



# Background

# Background - SLA Printer

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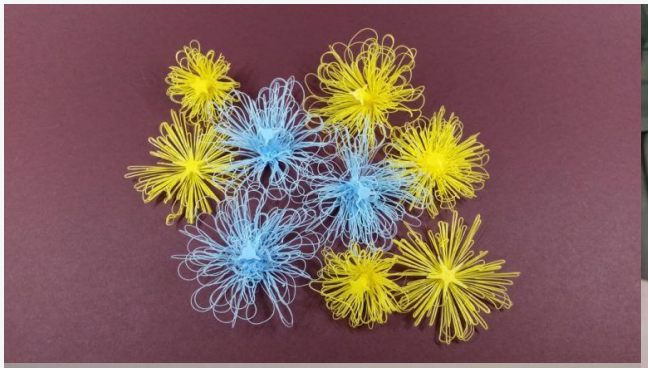
- SLA 3D Printing
- Voxel-based model generation method to instruct the printer to print various hair geometry and structure

# Background - FDM Printer

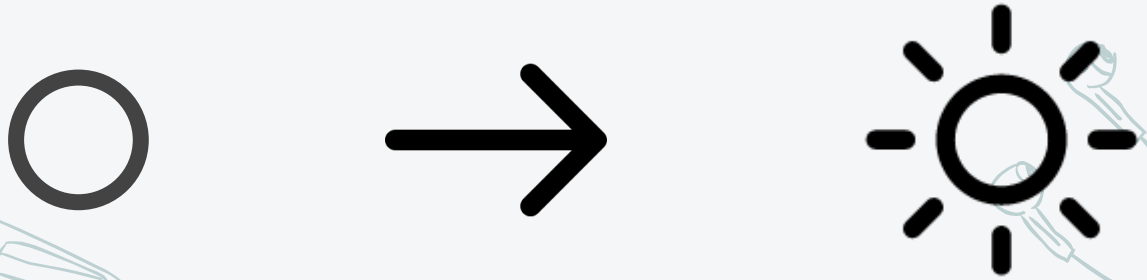


# Objectives

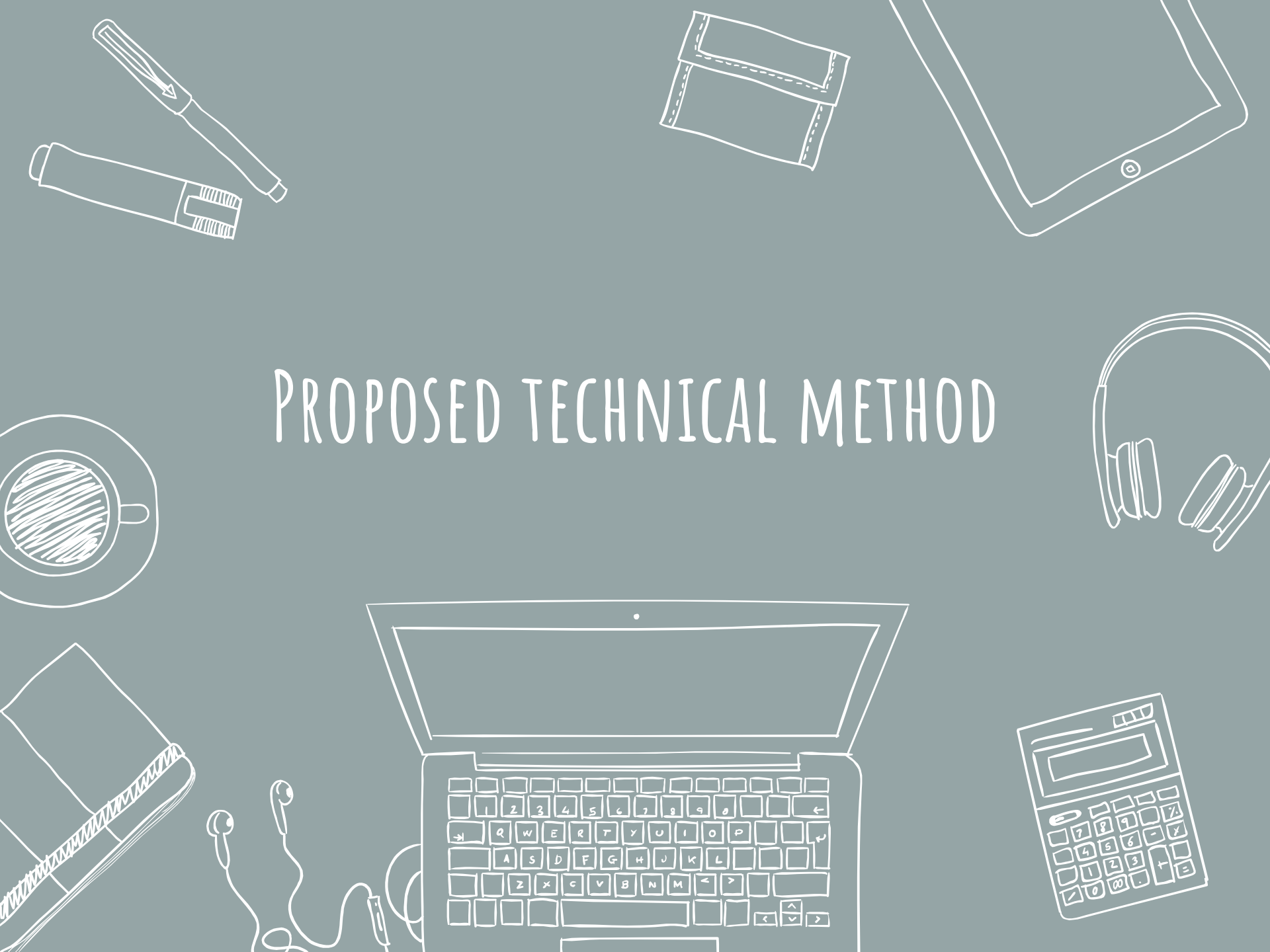
# Project Aim

A CAD program/plugin that:

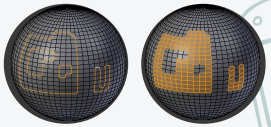
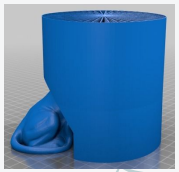
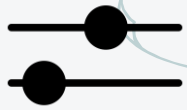
- takes in a .stl or .obj file and load the 3D mesh
- generates new **FDM-printable** model with add hairy features and relevant supports on areas marked by user
- works for objects of varying surfaces and sizes



# Proposed technical method

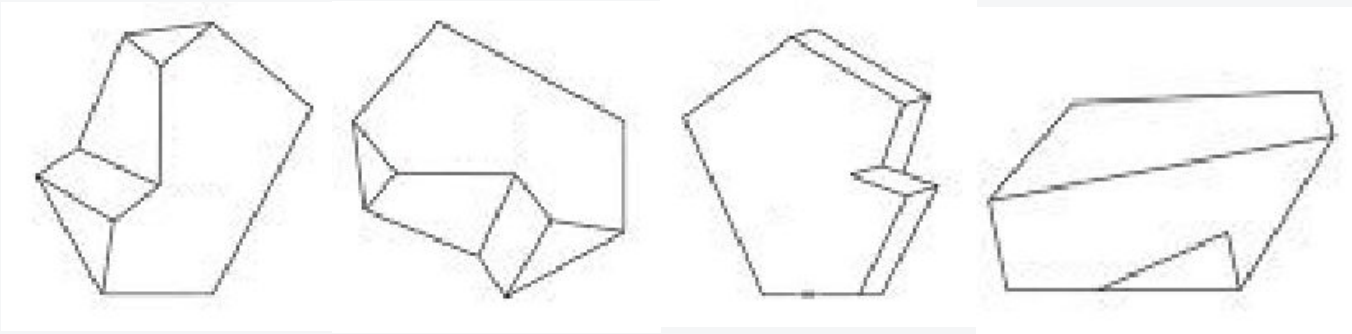


# Proposed technical method - Programming

| | |
|---|---|
| Platform:<br>CAD software plugin | e.g. Blender addon  |
| Function 1:<br>Mark out areas as hairy | e.g. loop inner region selection  |
| Function 2:<br>Generate hair and support | e.g. cylinder generation; cylinder-free “hairification”  |
| Function 3:<br>Customize hair thickness | e.g. global variable with validity range  |
| Output:<br>3D-printable mesh file | e.g. export in .stl or .obj format |

# Proposed technical method - Fabrication

Test hair generation for different geometries & orientations, eg:



Test 3D print & molding:

# Thanks!

## Any questions?

# REFERENCES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