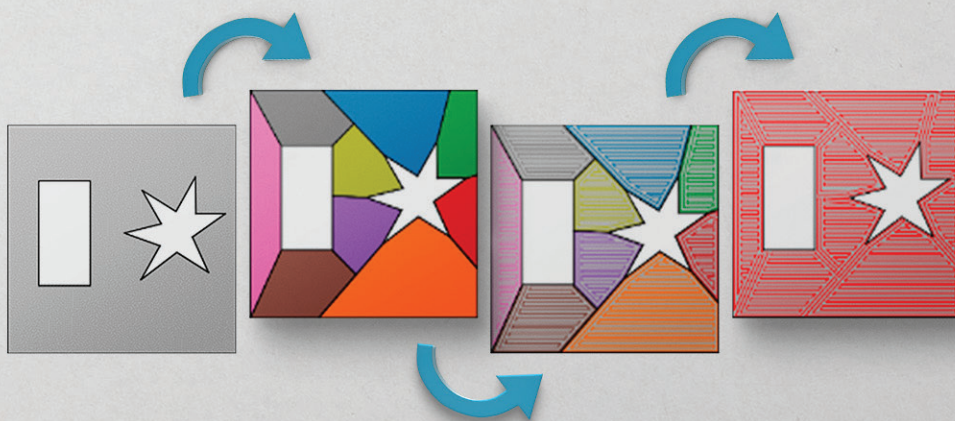


BIOPRINT is a multiplatform SDK focused on **geometrical processing and extrusion-based 3D printing trajectory generation for bioinspired models**. The objective of BIOPRINT is to provide **easy to use software tools** that would **optimize the 3D printing** results when using materials with low retraction properties (e.g., hydrogels) in printing surfaces used in the bio field.

Features

- Enable multi-material model generation
- Ease the generation of model geometry and material distribution
- Optimize the printing trajectory and path planning to minimize:
 - Extrusion interruptions
 - Material overlapping



Workflow for the generation of the continuous hybrid zig-zag pattern

Algorithms for

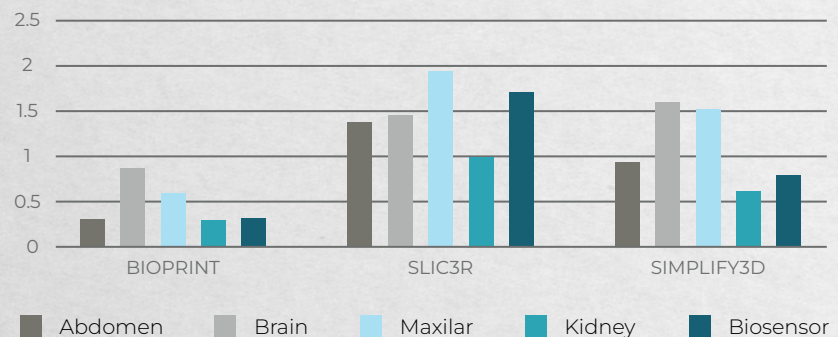
- Enable multi-material model generation
- Generation of the geometric specification of the trajectory to print contours and infill based on the printed thread thickness
- Trajectory optimization to reduce defects created by connection travel paths:
 - Strictly continuous hybrid zig-zag pattern generation
 - Path planning to minimize trajectory overlapping
- Multi-material model generation



■ Travel path ■ Printing path

Path planning result for the abdomen model

Normalized length of overlapping travel paths



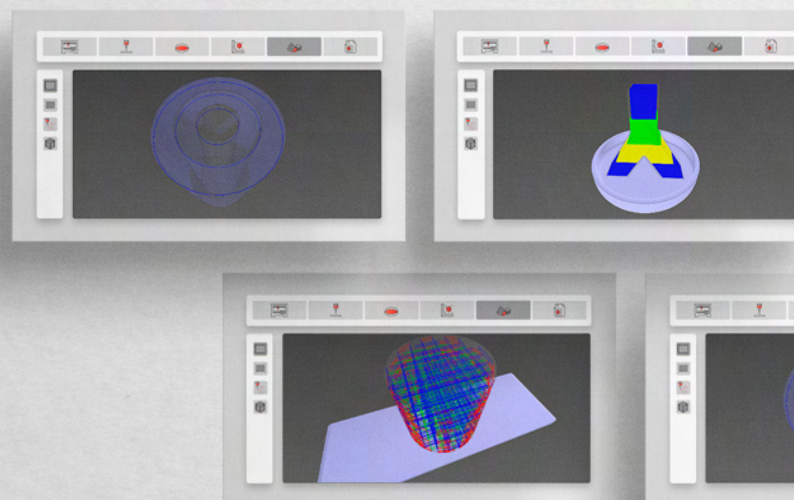
Overlapping travel paths result comparison with state of the art softwares

BIOPRINT is cross-platform and has been compiled and tested for Windows

Use cases

Application includes:

- Scaffold-based models
- Stacks of layers of different materials
- Nested structures of different materials
- Perimeter and infill with different materials



Programmatic generation of the multi-material models

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