# Z STITCH-INTERPLANAR STITCHING ALGORITHM FOR 3D PRINTING CROSS PLANAR INTERWEAVED OBJECTS

ID# 2023039

## HIGHLIGHTS

- An additive manufacturing toolpath algorithm provides a novel, non-planar printing technique that improves the mechanical properties of printed parts by providing an interweave between different layers.

## OPPORTUNITY

The University of Alberta inventors have developed an additive manufacturing toolpath algorithm that provides an original way of stitching the printed material across different layers, significantly improving the part's mechanical properties. Not only but also provide the ability to manipulate the final mechanical properties by tuning the stitch parameters.

This proposed technique involves designing a new tool path that provides perfect interlocking between multiple subsequent layers. The current technique overcomes traditional limitations to the orientation of the printed object to have good mechanical properties along the xy direction which in some cases are hard to be printed due to geometrical limitations.

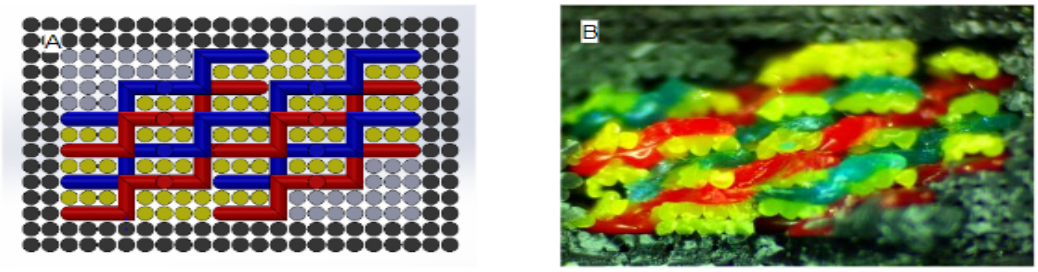


Figure 1 different views of the z-stitching algorithm (A) as-designed side section view (B) as-printed side section view.

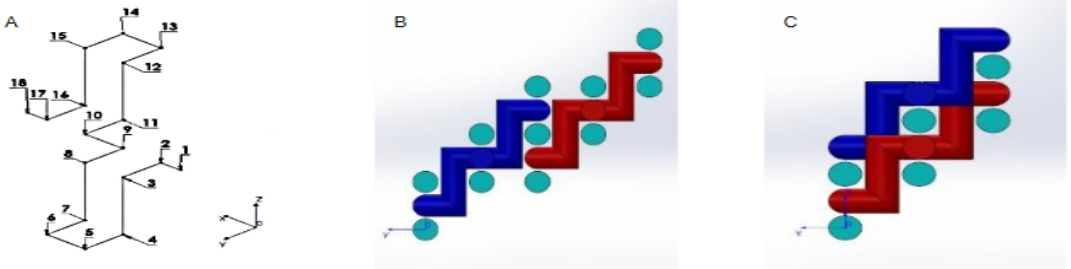


*Figure 2 (A) toolpath steps for stitch pattern (B) represents interlocking in z direction, (C) represents interlocking in y direction.*

## COMPETITIVE ADVANTAGE

- Facilitates printing structures with reduced anisotropy to achieve high mechanical properties in any orientation.
- Printed object exhibits stronger mechanical properties along all the axis.

## STATUS

- Patent Pending

## INVENTOR

- Ahmed Qureshi, Ahmed Elsherbiny, David Nobes, and Pierre Mertiny

## MORE INFORMATION

Robert Carruthers
Associate Director, Licensing
Technology Transfer Services, University of Alberta
825.601.5559
rwcarruthers@ualberta.ca