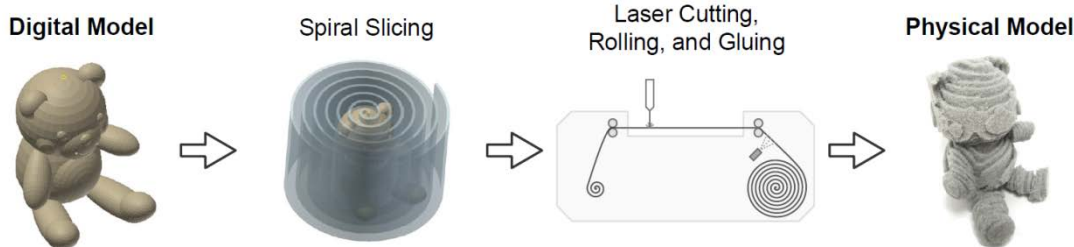


3DRolling: 3D Printed Objects Using a Scalable Roll-to-Roll Process

Invention Summary

This new approach for quickly printing 3D objects uses roll-to-roll processing. Initial tests shows a 10X enhancement in speed compared to traditional layer by layer approaches.

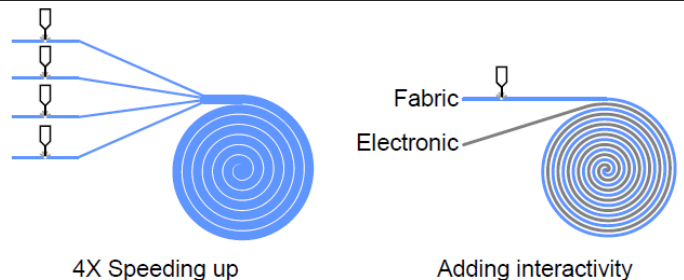
Technology Overview



Our approach allows for quick printing of soft, fabric-based 3D-objects by rolling a pattern around a spindle. CAD software allows calculation of a 2D-cutting pattern based on a 3D-model. The pattern is cut and glued in one step **using a modified commercial large-bed laser cutter**. Finally the extra material is removed to obtain the final object. The resolution of the final object is predominantly determined by the thinness of the rolled material; thinner material will permit higher resolution.

Preliminary results show an **enhancement in speed of more than 10X** compared to current methods where the object is built by cutting and then piling layers of material on top of each other. **Our roll-to-roll based technique can easily be extended to a wide variety of rollable materials including fabric, felt, paper, leather, plastics and wood veneer.**

One of the advantages of a roll-based system is the possibility of feeding a roll with several layers of material at once. This could be used to speed up printing by combining layers of the same material, creating composite materials, or integrating sensing and computing elements directly into the printout.



Potential Applications

- Rapid prototyping
- High speed manufacturing of soft objects

Advantages

- Dramatic enhanced speed compared to comparable 2D layering or 3D printing methods
- Suitable for a variety of materials
- Uses industry accepted roll-to-roll methods
- Electronics/sensors can easily be integrated using multi-roll setups

Publications

Francois Guimbretiere. "3d printing of rolled materials" International Patent Application No: [PCT/US2016/028111](https://patent.google.com/patent/PCT/US2016/028111)

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