

Innovation and Commercialization



Digital Light 4D printing: 3D Structures manufacturing with Programmed Morphologies & Motion

Tech ID: UTA 18-15

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TECHNOLOGY NEED

One of the challenges current 3D printing technologies face is the dependency of structures' size and number on the fabrication time. Although, recent advantages could increase the manufacturing speed and shape complexity, large part fabrication speed is still substantially lower than that of traditional methods like sheet forming.

INVENTION DESCRIPTION/SOLUTION

We provide a novel approach to produce self-shaping sheets that can be programmed to adopt various 3D structures. Due to its non-additive nature, this method simultaneously prints multiple 3D structures with custom designs and sizes from a single precursor solution all in a one-step process within 60 seconds and is thus highly scalable. The phototunable swelling and shrinking behaviors of our systems uniquely allow us to define target 3D shapes at any environment (e.g. water or air). The swelling and shrinking rates of material systems are programmable which allows creation of structures with desired dynamic motion.

APPLICATIONS

- Industrial manufacturing: rapid prototypes, large scale 3D manufacturing
- Healthcare: bio-medical devices, drug delivery, prosthetics
- Automotive: soft robots
- Consumer electronics

KEY BENEFITS

- Printing complex structures
- Independency of fabrication time to sample size and number
- Large scale production of 3D printing

STAGE OF DEVELOPMENT

Prototyped

INTELLECTUAL PROPERTY STATUS

PCT Patent Application



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