

## **3D Printing of Nanocomposites for Soft Robotics**

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**Abstract:** Despite extensive progress to engineer hydrogels for a broad range of technologies, practical applications have remained elusive. Stereolithography, SLA, has demonstrated extreme promise because of its ability to selectively create a desired structure layer-by-layer out of a liquid pre-gel solution under exposure to patterned light. As such SLA is an attractive manufacturing technique for rapid prototyping and the fabrication of customizable items like biomedical implants or scaffolds. In this presentation, I will review our efforts to develop nanocomposite systems for 3D printing of soft robotics. These new nanocomposites combine within a single platform tunable stiffness, toughness, extensibility, and resiliency. In addition to their excellent mechanical performance, they exhibit fast printing, conductivity, and actuation. The tunable properties combined with the ability for 3D-printing into complex architectures, provide opportunities for a variety of practical applications such as soft actuators, compliant conductors, and sensors for soft robotics.