



ICIRA 2023 Special Session Proposal

Title of the Proposal: 3D printing soft robots

Technical Outline of the Session and Topics:

Outline of the Session:

Soft robotic systems are made of soft materials that can generally sustain large deformation while inducing little pressure or damage when maneuvering through confined spaces. Owing to the inherent compliance of the soft materials, soft robotic systems are human-friendly and can mimic the complex motion of animals, which introduces promising potential in various applications, ranging from novel actuation and wearable electronics to bioinspired robots and biohybrid robots operating in unstructured environments. Due to the use of soft materials, the traditional fabrication and manufacturing methods for rigid materials are unavailable for soft robots, creating challenges for the fabrication of soft robots. 3D printing or additive manufacturing (AM) has emerged as a novel manufacturing process offering greater design freedom in complex geometries, sophisticated multi-material, and microstructural arrangements than traditional, subtractive, and assembly-based fabrication methods. The advantages of 3D printing make it a promising fabrication method for the multifunctional and multimaterial demands of soft robots. However, unresolved problems exist in experimental studies, analytical modeling, numerical simulations and optimization of 3D printing soft robots. This session aims to highlight recent progress in 3D printing soft robotics and inspire relevant research interests.

Topics of the Session:

- *Topic 1: Soft robotics*
- *Topic 2 3D Printing*
- *Topic 3: Modeling and Design*
- *Topic 4: Experiments*

Contact details of the Session Organizers

- *Organizer 1: Assoc. Prof. Dong Wang, Shanghai Jiao Tong University;*
- *Organizer 2: Assoc. Prof. Biao Zhang, Northwestern Polytechnical University;*
- *Organizer 3: Assoc. Prof. Yuanfang Zhang, South China University of Technology;*

- *Organizer 4: Asst. Prof. Yi Xiong, Southern University of Science and Technology*