



## Fall 2021 Mechanical Engineering Distinguished Speaker Series

**Dr. Yong Chen**

**Department of Industrial and Systems Engineering  
Department of Aerospace and Mechanical Engineering  
University of Southern California**

Date and time: October 4<sup>th</sup> @ 3:30 PM Venue: In Person 310 Kelly Hall

<https://virginiatech.zoom.us/j/89205188058?pwd=YTNURWc5NEdDVkxY0QxZ0JkTVljUT09>

Meeting ID: 892 0518 8058

Passcode: 259400

### **Additive Manufacturing of Bio-inspired Structures via Multi-scale, Multi-material, and Multi-functional 3D Printing**

Many natural structures out-perform conventional synthetic counterparts due to the specially evolved multi-scale, multi-material, and multi-functional architectures. However, most current 3D printing systems are designed to fabricate parts using a single material on a single scale, mainly for structural purposes. Such complex yet beautiful designs existing in natural structures are far beyond the fabrication capability of current 3D printing systems. This talk will report some of our recent work on developing new multi-scale, multi-material, and multi-functional additive manufacturing processes to fabricate bio-inspired structures, including the lobster structure, the nacre shell structure, the *Salvinia Molesta* leave structure, the limpet tooth structure, etc. After a brief overview of current 3D printing technology, several additive manufacturing (AM) processes to fabricate complex reinforcement architectures and functional surfaces will be presented. Some novel designs and promising applications enabled by the 3D-printed structures will also be discussed. The talk will conclude with remarks and thoughts on future 3D printing developments and potential opportunities for mechanical engineers.

#### **Speaker Biography**



Dr. Yong Chen is a professor of Industrial and Systems Engineering and Aerospace and Mechanical Engineering at the *University of Southern California* (USC). His research focuses on additive manufacturing (3D printing) in micro- and meso- scales. He has published more than 150 publications in refereed journals and conferences and 12 issued and pending U.S. patents. He received over ten *Best/Outstanding Paper Awards* in major design and manufacturing conferences. Other major awards he received include the NSF *CAREER Award* and USC's *Innovation Commercialization Awards*. Dr. Chen is a Fellow of the American Society of Mechanical Engineers (ASME). He has served as conference/program chairs and keynote speakers in several international design and manufacturing conferences.

**Host: Lei Zuo (leizuo@vt.edu)**