SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: 4D printing, Smart Materials & Structures Mechanics

Host: Associate Professor Qiu Chengwei

TOPIC	:	**Programmable Shape Memory Composites and 4D Printing**
SPEAKER	:	**Professor Leng Jinsong** **Harbin Institute of Technology, China**
DATE	:	**Monday, 3 April 2023**
TIME	:	**3:00PM to 4:30PM**
VENUE	:	**Block E5, E5-02-32** **College of Design and Engineering, National University of Singapore**

ABSTRACT

Stimuli-responsive polymers refers to a kind of smart materials that are capable of changing shapes or sizes when subjected to external stimulus. As typical stimuli-responsive materials, shape memory polymers (SMPs) and their composites (SMPCs) have advantages like a fast response, long lifetime, high resilience, light weights, stretchability, low cost, and easy processing. Furthermore, their stiffness can be tailored over an extremely large range by adjusting composition and curing/crosslinking conditions. These special features make them promising materials for sensors and actuators, with broad application potential in biomedical devices, deployable structures, tactile displays, self-healing systems, smart textiles, etc. 4D printing allows the development of “living” adaptable structures from SMPs/SMPCs. We have developed a series of shape-morphing structures through 4D printing, including a vascular stent, vascular stent, and space deployable structures. Moreover, the challenge and potential of 4D printing of shape memory polymers/composites are thoroughly discussed. It would not be an exaggeration to say that the 4D printing of active deformable structures, like shape memory composite structures, could lead to revolutionary developments in several areas.

BIOGRAPHY

Jinsong Leng is a Member of Chinese Academy of Sciences, Dean of School of Future Technology, Director of the Center for Smart Materials and Structures (CSMS), and Director of International Center for Applied Mechanics at Harbin Institute of Technology (HIT), China. His research fields include smart materials and structures, sensors and actuators, stimulus-responsive polymers (shape memory and electro-active polymers) and their composites, multifunctional nanocomposites, 4D printing, space deployable structures, etc. He currently serves as Vice President of the International Committee on Composite Materials (ICCM), Vice President of the Chinese Society for Composite Materials (CSCM), Vice President of Chinese Society of Aeronautics and Astronautics (CSAA), and Editor-in-Chief of the International Journal of Smart and Nano Materials (IJSNM). He was elected as the Foreign Member of Academia Europaea, Member of the European Academy of Sciences and Arts, Fellow of American Association for the Advancement of Science (AAAS), Fellow of the Society of Photo-Optical Instrumentation Engineers (SPIE), Fellow of Institute of Physics (IOP), Fellow of Royal Aeronautical Society (RAeS), Fellow of Institute of Materials, Minerals, and Mining (IMMM) and Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA). He has published over 390 peer-reviewed papers and holds over 140 issued patents.