Department of Mechanical Engineering
THE UNIVERSITY OF HONG KONG

Tam Wing Fan Inno Wing Two
FACULTY OF ENGINEERING

TITLE: Architected Soft Matter and the 4th dimension

(onsite and online)

Seminar organized by the Department of Mechanical Engineering

Date: December 9, 2025 (Tuesday)
Time: 2:00 PM – 3:30 PM (Hong Kong Time)
Venue: The Tam Wing Fan Innovation Wing Two
HKU

Speaker: Professor Howon Lee
Associate Professor
Department of Mechanical Engineering
Seoul National University
Korea

Zoom Online Lecture: https://tinyurl.com/4y8szuzp

Meeting ID: 956 6747 3144

Passcode: 643159

Abstract:

Stimuli-responsive soft matter promises great potential for autonomous and intelligent engineering systems when precisely manufactured in specific architectures with programmed responses. Emerging pathway to create such dynamic systems involves additive manufacturing (AM) of stimuli-responsive and programmable soft matter. This approach has been termed "*4D printing*", with the 4th dimension being time. In this talk, additive manufacturing of various soft matter, including hydrogels, shape memory polymers (SMP), and liquid crystal elastomers (LCE), is presented. Combining rapid, versatile, and scalable AM technique with various functional soft matter, design principles and mechanics inspired by exquisite motions and morphologies in nature are physically realized. Also presented is a new paradigm for designing architected materials driven by artificial intelligence. A point cloud-based generative algorithm enables the inverse design of 3D metamaterial without parametric constraints, allowing for both property-guided inverse design and generation of topologically gradient transition between distinct unit cell types.

Biography:

Professor Howon Lee is an Associate Professor in the Department of Mechanical Engineering at Seoul National University (SNU). He received his BS (2004) and MS (2006) from SNU, and PhD (2011) from the University of Illinois at Urbana-Champaign (UIUC), all in mechanical engineering. He then held a Battelle/MIT Postdoc Fellow position at MIT from 2012 to 2013. He was advised by Professor Nicholas Fang for his PhD and postdoctoral training at UIUC and at MIT, respectively. Before joining SNU in 2021, Professor Lee was an Assistant Professor at Rutgers University – New Brunswick. He was awarded the Battelle/MIT Postdoctoral Associate Fellowship (2012), the ASME Haythornthwaite Young Investigator Award (2016), the World Congress Micro and Nano Manufacturing Best Paper Award (2018), and Materials Horizons Outstanding Paper Award (2019). He also received SNU Excellent Teaching Award and was selected by students as Professor of the Year for outstanding teaching at Rutgers (2020) and at SNU (2024), respectively.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. Nicholas Fang at 3917 2639.