



[Distinguished Lecture]

1. Title : **Data-Driven Design of Engineered Material Systems**
2. Speaker : **Wei Chen, Professor and Chair, Northwestern University**
3. Time : **2024-08-30 (FRI) 16:00-17:00**
4. Location : **Room 204 , Building 301**

link : <https://snu-ac-kr.zoom.us/j/89719629277>



5. **Abstract** : Designing advanced material systems poses challenges in integrating knowledge and representation from multiple disciplines and domains such as materials, manufacturing, structural mechanics, and design optimization. Data-driven machine learning and computational design methods provide a seamless integration of predictive materials modeling, manufacturing, and design optimization, enabling the accelerated design and deployment of advanced material systems. In this talk, we will introduce state-of-the-art data-driven methods for designing heterogeneous nano- and microstructural materials and complex multiscale programmable metamaterial systems. We will discuss research developments in design representation, design evaluation, and design synthesis, along with novel design methods that integrate machine learning, mixed-variable Gaussian process modeling, Bayesian optimization, topology optimization, and the concept of digital twins. Furthermore, we will address the challenges and opportunities involved in designing engineered material systems with physical intelligence.
6. **Bio** : Dr. Wei Chen is the Wilson-Cook Professor in Engineering Design and Chair of the Department of Mechanical Engineering at Northwestern University. She directs the Integrated DEsign Automation Laboratory (IDEAL) and focuses on statistical inference, machine learning, and uncertainty quantification for designing emerging materials systems. Dr. Chen leads the Design Thrust for the NSF Engineering Research Center on Hybrid Autonomous Manufacturing (HAMMER), working on digital twin systems. She is a member of the National Academy of Engineering (NAE) and the American Academy of Arts and Sciences (AAA&S). She has served as Editor-in-chief of the ASME Journal of Mechanical Design and held leadership roles in ASME and ISSMO.
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