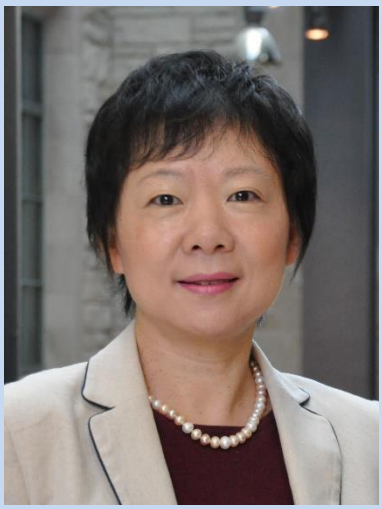
KTH SOLID MECHANICS KEYNOTE SEMINAR; Thursday, May 20th, 16.15; https://kth-se.zoom.us/j/62509294747

Wei Chen's KEYNOTE seminar "Data-Driven Design of Engineered Materials Systems"

Design of advanced material systems imposes 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 to enable the accelerated design and deployment of advanced materials systems. In this talk, we will introduce the state-of-the-art data-driven methods for designing heterogeneous nano- and microstructural materials such as polymer nanocomposites, functional microelectronics, and solar cells, as well as complex multiscale metamaterial systems. Research developments in design representation, design evaluation, and design synthesis will be introduced with techniques of microstructure characterization and reconstruction, machine learning, mixed-variable Gaussian process modeling, and Bayesian optimization. Challenges and opportunities in designing engineered material systems will be discussed.



Wei Chen is the Wilson-Cook Professor in Engineering Design and Chair of Department of Mechanical Engineering at Northwestern University. Directing the Integrated DEsign Automation Laboratory (IDEAL-http://ideal.mech.northwestern.edu/), her current research involves issues such as simulation-based design under uncertainty; model validation and uncertainty quantification; data science in design and advanced manufacturing; stochastic multiscale analysis and materials design; design of metamaterials; multidisciplinary design optimization; consumer choice modeling and decision-based design. Dr. Chen is an elected member of the National Academy of Engineering (NAE) and currently serving as the Editor-in-chief of the ASME Journal of Mechanical Design and the President of the International Society of Structural and Multidisciplinary Design (ISSMO). Dr. Chen was the recipient of the ASME Design Automation Award (2015), Intelligent Optimal Design Prize (2005), ASME Pi Tau Sigma Gold Medal achievement award (1998), and the NSF Faculty Career Award (1996). She received her Ph.D. from the Georgia Institute of Technology in 1995.