DEPARTMENT of INDUSTRIAL ENGINEERING
UNIVERSITY of HOUSTON

FRIDAY SEMINAR SERIES
BROADEN HORIZONS | EXTEND MINDS

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Ann Arbor, MI

Date: Friday, March 1, 2024
Time: 1:00 -- 1:50 pm
Location: D2 Lect 2

Digital Twin Calibration with Big data

Abstract: The advancements in numerical algorithms and computational power have elevated the role of digital twins in design and analysis of many systems. The development of digital twins often hinges on the application of physics-based first principles and necessitates the accurate designation of numerous parameters. However, certain scenarios prevent the accurate determination of these parameters via physical laws, prompting domain specialists to resort to educated guesses. These assumptions, though well-intended, can lead to significant discrepancies between a digital twin's outputs and the actual system's performance. To ensure the digital twins closely mimic their real-world counterparts, this research capitalizes on the power of Big Data. Concurrently, it caters to the research challenges inferred from the sheer volume and complexity of the datasets. This research lays a strong foundation for an efficient and resilient parameter calibration process by establishing a quantitative scheme by harmoniously integrating data science theories and cutting-edge tools within the data-driven optimization framework, thereby offering both practical and theoretical implications.

Biography: Dr. Eunshin Byon is an Associate Professor and Richard Wilson Scholar in the Department of Industrial and Operations Engineering at the University of Michigan, Ann Arbor, USA. She received her Ph.D. degree in the Industrial and Systems Engineering from the Texas A&M University, College Station, USA in 2010. Dr. Byon's research interests include data science, quality and reliability engineering, system informatics and uncertainty quantification. Dr. Byon's research team has received several Best Paper recognitions from the Quality, Reliability and Statistics (QSR) and Data Mining sections of INFORMS, IISE Transactions, Data Analytics & Information Systems (DAIS) and Energy Systems (ES) subdivisions of IISE Annual Conference & Expo (ISERC). Currently, Dr. Byon serves as department editor of IISE Transactions and associate editor of INFORMS Journal on Data Science. She was also an associate editor for IEEE Transactions on Automation Science and Engineering.