Industrial, Systems, and Manufacturing Engineering
IME Colloquium Presentation

Dr. Saideep Nannapaneni
Assistant Professor in the Department of Industrial, Systems, and Manufacturing Engineering

Title: Model-based Analytics under Uncertainty
Date: Friday – October 19, 2018
Time: 1 pm – 2 pm
Location: Clinton Hall 214

Abstract

Modeling and simulation methods are increasingly being used for the design and analysis of complex engineering systems to avoid high experimental costs and to lower design time. Robust modeling requires the consideration of several uncertainty sources that may impact the model predictions such as the uncertainty in the inputs, uncertainty in the models and uncertainty in the measurements. Consideration of various uncertainty sources provides not only a prediction but also a confidence measure in the prediction. Such confidence measures can be beneficial for designing robust systems. In this presentation, different types of uncertainty sources will be discussed, techniques for their quantification and aggregation, and their inclusion in the system design will be discussed. In addition, analytics and design methods for cyber-physical systems will also be discussed. Cyber-Physical systems are feedback control systems where a computing system controls a physical process (such as a manufacturing process) through sensor measurements and implementing appropriate actuation. This presentation primarily covers Bayesian probability methods such as Bayesian network and Dynamic Bayesian network models for uncertainty aggregation and robust model predictions.

Speaker Biography

Dr. Saideep Nannapaneni is an Assistant Professor in the Department of Industrial, Systems, and Manufacturing Engineering at Wichita State University since Janary 2018. His research interests include surrogate modeling, uncertainty quantification, Bayesian informatics and design optimization under uncertainty with applications to mechanial, manufacturing, aerospace and cyber-physical systems. He received his PhD and MS from Vanderbilt University in 2017 and 2015 respectively, and received his Bachelors degree from the Indian Institute of Technology Madras in 2012. He worked on projects funded by NASA (Langley, Ames), National Institute of Standards and Technology (NIST), Air Force Office of Scientific Research (AFOSR) and Siemens Corporate Technology. He has authored about 25 technical publications through AIAA, ASME, IEEE and ACM journals and conference proceedings. One of his publications was identified as a paper of distinction, and nominated for the best paper award at the 2016 ASME International Design Engineering Technical Conference (IDETC).