Wind Turbine Reliability and Performance Assessment, and the Data Science Relevance

Presented by:

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Wind energy is the front-runner of renewable energy sources. Its installed capacity in the U.S. has increased more than 20 folds in the past 16 years, from 4.2 GW in 2001 to 82 GW in 2017. Department of Energy contemplates the scenarios that wind generates 20% of the nation’s electricity by 2030 and 35% by 2050. The ever-changing wind exerts a nonstationary and non-steady load on wind turbine drive train, causing wind turbines to deteriorate faster than other turbine machineries. Harsh environmental conditions such as icing and lighting add to the low reliability of wind turbines, which in turn drives up the cost of operations and maintenance (O&M). High O&M cost becomes one major obstacle towards wind energy’s market competitiveness and viability without government subsidy. We will discuss in this talk the reliability issue in wind energy, approaches to assess the system-level performance for a wind turbine generator and strategies to countermeasure the decline in a turbine’s power production capability as well as the data science relevance to addressing research challenges in wind energy applications.

About the Speaker:

Dr. Yu Ding is the Mike and Sugar Barnes Professor of Industrial and Systems Engineering, Professor of Electrical and Computer Engineering, and a faculty affiliate with Texas A&M Energy Institute and Institute of Applied Mathematics and Computational Sciences, all at Texas A&M University. Dr. Ding received a bachelor’s degree from the University of Science and Technology of China in 1993, a master’s degree from Tsinghua University in 1996, a master’s degree from Penn State University in 1998, and his PhD from the University of Michigan in 2001. His research interests are in the area of system informatics, and data and quality science. Dr. Ding is a Fellow of IIE, a Fellow of ASME, a member of INFORMS, and a senior member of IEEE.