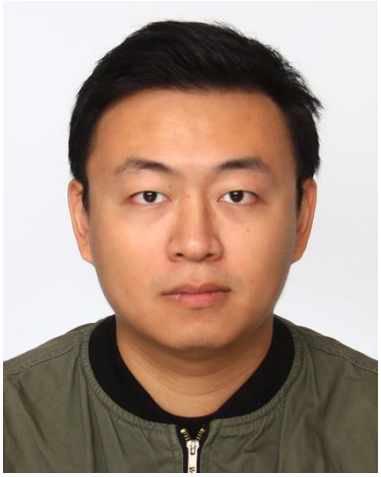
IOWA STATE UNIVERSITY
Department of Industrial and Manufacturing Systems Engineering

Fall 2019 Graduate Seminar Series



Time varying optimization with application in power system

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Abstract
Future power system is expected to have over 50% penetration of renewable energy sources (RES), which are controllable by customers. Comparing to traditional power grids, more controllable devices are made grid-friendly and integrated into the grid, which makes the control complexity increased significantly. Existing techniques do not offer decision-making capabilities that are consistent with the form and function of future large-scale systems, which will be governed by faster dynamics, and therefore cannot guarantee a reliable, resilient, and efficient system operation. In this talk, I will first formulate the optimal power flow problem as a time varying nonlinear program with equality constraints and then give a dynamic distributed algorithm that can continuously track optimal solutions. In addition, I will discuss how to analyze the algorithm and necessary assumptions associated with it. The efficacy of proposed algorithm is shown in a IEEE-37 node test feeder example, where real grid data from California is used.

About the Speaker
Yijian Zhang is a Ph.D. student in the Department of Industrial and Manufacturing Systems Engineering in Iowa State University. His current research focuses on designing dynamic algorithms for time varying optimization problems and analyzing convergence performance. He is also interested in general nonlinear optimization and its application in machine learning problems.