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Operations Research and Engineering Management
Seminar Series

Research Seminar

An Extended Unit Commitment Formulation and Convex Hull Pricing for Electricity Markets

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11:00 a.m. – 12:15 p.m.
https://smu.zoom.us/j/97906267193

Abstract
Uplift payment minimization through convex hull pricing has been studied to increase market transparency. It has been shown that the convex hull price could provide an optimal uniform price for the system. However, it was considered a challenging problem to solve due to non-convexity in power system operations. In this talk, we briefly describe how an electricity market works and introduce an extended unit commitment formulation. Based on the derived extended formulation, an exact convex hull price can be obtained in a tractable way. We further explore

solution approaches to solve large-scale problems and incorporate practical electric market settings, including self-commitment offers, transmission constraint violations, and online generation compensation-only payment scheme options. The computational experiments on large-scale electricity systems show the effectiveness of the proposed approaches.

Biography

Yongpei Guan serves as the George and Rolande Willis Endowed Professor in the Department of Industrial and Systems Engineering at the University of Florida. He is the Director of the UF Center for Applied Optimization and co-Director of the Supply Chain and Logistics Engineering Center. His research interests include stochastic and discrete optimization, supply chain management, and electricity market analysis. He is a Fellow of IEEE and a Fellow of IISE.