Difusión Seminario

Lugar: **Ingar** (Sala de Conferencias)

Domicilio: Avellaneda 3657

Día: **Lunes 14 de Agosto** de 2017

Hora: **11:30 hs**

Disertante

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Temas*

MILP Formulation and Nested Benders Decomposition for Optimal Planning of Electric Power Infrastructures

Abstract

In this talk, we address the long-term planning of electric power infrastructures considering high renewable penetration. To capture the intermittency of those sources, we propose a deterministic MILP planning model that includes operating decisions on an hourly basis. The major challenges lie in the multi-scale integration of geographically distributed power plants and detailed operating decisions at the hourly level with investment planning decisions over a few decades. To address this

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problem we propose aggregation and time sampling techniques. Furthermore, we propose a decomposition algorithm based on Nested Benders Decomposition mixed-integer multi-period problems, for which we introduce valid cuts and acceleration techniques. The proposed formulation and algorithm are applied to a case study in the region managed by the Electric Reliability Council of Texas (ERCOT) for a 30 year planning horizon. We demonstrate that large computational savings with our decomposition.

New Optimization Paradigms for Formulation, Solution, Data and Uncertainty Integration, and Results Interpretation

Abstract

This talk was given at the 2040 Visions of Process Systems Engineering, Symposium on Occasion of the George Stephanopoulos's 70thBirthday and Retirement from MIT. The talk attempts to provide a number of outstanding challenges on mathematical programming and its application to the optimization for process systems. We first point out the pitfalls with long term prediction, and therefore we start by reviewing the history and evolution of mathematical programming. We next discuss challenges associated with facilitating model formulation, increasing efficiency of combinatorial optimization and robustness of solution of nonlinear optimization problems, integration of data analytics with optimization models to address uncertainty, and providing qualitative explanation of solution of optimization models. Hopefully, this talk will motivate young researchers to address and solve some of the outstanding research challenges.

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