



भारतीय प्रबंध संस्थान बेंगलूर
INDIAN INSTITUTE OF MANAGEMENT
BANGALORE

The Decision Sciences Area at IIM Bangalore welcomes you to a webinar, titled:

Taming the Duck for a Sustainable Power Grid with High Renewable Integration

by

Dr. Harsha Gangammanavar



Date: 22nd December, 2021

Time: 6:30 p.m. to 7:30 p.m.

Abstract:

Driven by ambitious renewable portfolio standards, we expect large-scale inclusion of variable energy resources (such as wind and solar) to introduce unprecedented levels of uncertainty into power system operations. The current practice of operations planning with deterministic optimization models may be ill-suited for a future with abundant uncertainty. To overcome the potential reliability and economic challenges, we combine approaches in Operations Research and Data Science through Stochastic Programming (SP) to build stochastic hierarchical planning (SHP) framework. This framework captures operations at multiple (day-ahead, short-term, and hour-ahead) timescales. The SHP framework results in stochastic optimization models stitched together in a hierarchy to capture interactions between decision and stochastic processes at different timescales. These models were solved using state-of-the-art stochastic programming algorithms presented in the first part of this two-part lecture on stochastic programming. Our computational experiments on a realistic power system show that we achieve significant improvements in several metrics, including system reliability, environmental sustainability, and system economics, solely by adopting the new SHP paradigm.

This is a joint work with Dr. Semih Atakan (Amazon Inc.) and Prof. Suvrajeet Sen (USC).