Engineering Management, Information, and Systems
Seminar Series

Research Seminar

New Algorithms and Complexity Analysis of Multistage Stochastic and Distributionally Robust Optimization

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11:00 a.m. – 12:15 p.m.
Zoom link: https://smu.zoom.us/j/95095343594

Abstract: In this talk, we will discuss some new advances in algorithm design and analysis for multistage stochastic optimization. In particular, we will present a general framework of stochastic dual dynamic programming algorithms (SDDP) for

solving multistage stochastic mixed integer nonlinear programs (MS-MINLP). This new framework significantly generalizes the traditional SDDP algorithm for multistage stochastic linear program and the recent stochastic dual dynamic integer programming (SDDiP) for multistage stochastic mixed-integer linear programs to MS-MINLP and multistage distributionally robust optimization with non-Lipschitzian value functions. We will also present a complete result that settles an important open question regarding the iteration complexity of SDDP-type algorithms in this general framework. This is joint work with my doctoral student Shixuan Zhang.

Biography: Dr. Andy Sun is an associate professor and Anderson-Interface Early Career Professor in the School of Industrial and Systems Engineering at the Georgia Tech. Sun has a broad research agenda on nonconvex optimization in both continuous and discrete domains, multistage stochastic and robust optimization, distributed optimization of nonconvex network constrained programs, and stability and control of second-order oscillators. Dr. Sun's research has won several awards, including the Dantzig Dissertation Award, the NSF CAREER Award, the INFORMS ENRE Best Publication in Energy, the Best paper Published in IEEE Trans. Power System in 2017-2019, among others. Dr. Sun's work has been implemented in the electricity markets in the US. Dr. Sun obtained his PhD degree in Operations Research from MIT, and was a postdoctoral researcher at the IBM Watson Research Center, before joining Georgia Tech.