

# IE Decision Systems Engineering

## Fall '21 Seminar Series

### Dual Dynamic Programming Algorithms for Multistage Stochastic Optimization: Complexity Analysis and Application

Friday, September 10, 2021, 12:00PM (AZ time)

Via Zoom: <https://asu.zoom.us/j/8120740932>

#### Abstract

In this talk, we will present some new advances in algorithm design and analysis for multistage stochastic optimization. In particular, we will present a general framework of dual dynamic programming algorithms (DDP) for solving multistage stochastic mixed integer nonlinear programs and discuss an application in multistage stochastic unit commitment in electric power systems. We will also give a complexity analysis that settles an open question regarding the iteration complexity of DDP-type algorithms in this general framework. This is joint work with my doctoral student Shixuan Zhang.



**Dr. Andy Sun**

**David McKenney  
Family Associate  
Professor**

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#### Bio

Dr. Andy Sun is the David McKenney Family Associate Professor in the School of Industrial and Systems Engineering at the Georgia Tech. Dr. 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 nonlinear dynamical systems. 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 major 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.

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