Computer Science
Seminar

Integrating Machine Learning and Discrete Optimization

Bistra Dilkina
USC Viterbi

Abstract: Solving some of the most challenging environmental and societal problems of our times will require solving complex problems with limited resources, often at large scale. Applications such as wildlife conservation planning, disaster-resilient infrastructure planning and tuberculosis treatment can all benefit from improved integration between machine learning and combinatorial optimization. I will demonstrate how one can rethink the traditional branch-and-bound tree search for Mixed Integer Programming through the lens of learning-driven algorithm design to create more flexible combinatorial solvers able to learn tailored solution strategies over distributions of instances. In the opposite direction, I will also illustrate how combinatorial optimization can be directly integrated into deep learning pipelines to facilitate decision-focused learning – where the training loss is a function of the quality of downstream optimization decisions based on parameters estimated by the ML model. ¡br¿¡br¿ Bio: Bistra Dilkina is an Associate Professor of Computer Science at the University of Southern California. She is also the co-Director of the USC Center for AI in Society (CAIS). During 2013-2017, Dilkina was an Assistant Professor in the College of Computing at the Georgia Institute of Technology and a co-director of the Data Science for Social Good Atlanta summer program. She received her PhD from Cornell University in 2012, and was a Post-Doctoral Associate at the Institute for Computational Sustainability until 2013. Dilkina is one of the junior faculty leaders in the young field of Computational Sustainability, and has co-organized workshops, tutorials, special tracks at major conferences on Computational Sustainability and related subareas. Her work spans discrete optimization, network design, and machine learning.

Friday, November 13, 2020, 1:00 pm
https://emory.zoom.us/j/92722816908

Computer Science
Emory University