A cordial invitation to the
Brown Bag Seminar
Recent Developments in Data Science:

Data-Driven Distributionally Robust Optimization over Time

By
Dr. Kartikey Sharma

Date: 06.07.2023 (Thursday) at 12:00

Location: R 301 WIWI

Link and further information: https://pubsonline.informs.org/doi/abs/10.1287/ijoo.2023.0091

Abstract:

Stochastic optimization (SO) is a classical approach for optimization under uncertainty that typically requires knowledge about the probability distribution of uncertain parameters. Because the latter is often unknown, distributionally robust optimization (DRO) provides a strong alternative that determines the best guaranteed solution over a set of distributions (ambiguity set). In this work, we present an approach for DRO over time that uses online learning and scenario observations arriving as a data stream to learn more about the uncertainty. Our algorithm achieves the optimization and learning goals without solving the DRO problem exactly at any step. We also provide a regret bound for the quality of the online strategy that converges at a rate of $O(\log T/\sqrt{T})$, where T is the number of iterations. Furthermore, we illustrate the effectiveness of our procedure by numerical experiments on mixed-integer optimization instances from popular benchmark libraries and give practical examples stemming from telecommunications and routing.

Speaker:

Kartikey Sharma is postdoctoral researcher at Zuse Institute Berlin. He completed his PhD in Industrial Engineering at Northwestern University. His research interests are in robust and distributionally robust optimization, explainable and adversarial machine learning, and generalisation bounds for machine learning.

Dr. Kartikey Sharma