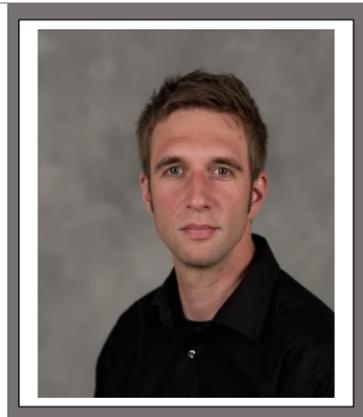


Lazifying Conditional Gradients

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Abstract

Both, discrete optimization techniques as well as machine learning approaches have made significant progress over the last decades and can be considered important tools that are regularly used in applications. However, very little has been done at the intersection of the two disciplines despite their unprecedented real-world significance: as soon as the underlying set of decisions that we want to optimize over is of a combinatorial or discrete nature standard learning approaches fail due to unacceptable running times or real-world irrelevant guarantees. At the same time many strategic, tactical, and operational challenges that we face (e.g., in dynamic routing, ad allocation, pick path optimization, dynamic pricing, demand prediction, etc.) require a tight integration of data, learning, and decision making.

(Abstract cont.) In this talk I will provide a general method to significantly speed-up convex optimization and learning by modifying conditional gradient algorithms. This new approach is particularly effective in the context of combinatorial problems leading to several orders of magnitude in speed-up...

Biography

Sebastian Pokutta is the David M. McKenney Family Associate Professor in the School of Industrial and Systems Engineering and an Associate Director of the Machine Learning @ GT Center at the Georgia Institute of Technology. Having received both his diploma and Ph.D. in mathematics from the University of Duisburg-Essen in Germany, Pokutta was a postdoctoral researcher and visiting lecturer at MIT, worked for IBM ILOG, and Krall Demmel Baumgarten. Prior to joining the Georgia Institute of Technology, he was a Professor at the University of Erlangen-Nürnberg. Sebastian received the David M. McKenney Family Early Career Professorship in 2016, an NSF CAREER Award in 2015, the Coca-Cola Early Career Professorship in 2014, the outstanding thesis award of the University of Duisburg-Essen in 2006, as well as various Best Paper awards. Pokutta's primary research interests are in optimization and machine learning in the context of polyhedral combinatorics, in particular extended formulations and continuous optimization techniques as well as analytics with a focus on real-world applications, both in established industries as well as in emerging technologies. Application areas include but are not limited to supply chain management, finance, cyber-physical systems, and predictive analytics.

Hosted by: Giulia Pedrielli