报告

机器学习中风险优化的分布鲁棒模型及求解算法
Distributionally Robust Risk Minimization in Machine Learning: Models and Algorithms

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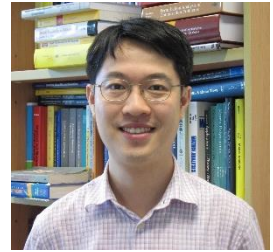
讲者介绍 Biography

Anthony Man-Cho So received his BSE degree in Computer Science from Princeton University with minors in Applied and Computational Mathematics, Engineering and Management Systems, and German Language and Culture. He then received his MSc degree in Computer Science and his PhD degree in Computer Science with a PhD minor in Mathematics from Stanford University. Dr. So joined The Chinese University of Hong Kong (CUHK) in 2007. He currently serves as Associate Dean of Student Affairs in the Faculty of Engineering and is Professor in the Department of Systems Engineering and Engineering Management. His research focuses on optimization theory and its applications in various areas of science and engineering, including computational geometry, machine learning, signal processing, and statistics.

Dr. So is appointed as an Outstanding Fellow of the Faculty of Engineering at CUHK in 2019. He has received a number of research and teaching awards, including the 2018 IEEE Signal Processing Society Best Paper Award, the 2015 IEEE Signal Processing Society Signal Processing Magazine Best Paper Award, the 2014 IEEE Communications Society Asia-Pacific Outstanding Paper Award, the 2013 CUHK Vice-Chancellor's Exemplary Teaching Award, and the 2010 Institute for Operations Research and the Management Sciences (INFORMS) Optimization Society Optimization Prize for Young Researchers. He currently serves on the editorial boards of Journal of Global Optimization, Optimization Methods and Software, and SIAM Journal on Optimization. He is also the Lead Guest Editor of the IEEE Signal Processing Magazine Special Issue on Non-Convex Optimization for Signal Processing and Machine Learning.

报告摘要 Abstract

Distributionally robust optimization (DRO) is a paradigm for optimal decision-making under uncertainty. It postulates that the data of the optimization problem at hand follow an unknown probability distribution from a certain known family and aims to find a decision that has the best performance with respect to the worst distribution in the family. DRO has attracted much attention in the machine learning community lately, as it offers interesting interpretations of regularization and motivates new approaches to various learning tasks. Although many DRO problems arising in the learning context admit convex reformulations, there is currently a lack of fast iterative methods for solving them. This severely limits the applicability of the DRO approach in machine learning. In this talk, we will first survey some recently discovered connections between DRO and machine learning. Then, we will present a new first-order algorithmic framework for Wasserstein distributionally robust regression problems. Lastly, we will discuss some future research directions.

有兴趣合作之项目 Interested topics for future collaboration

Design and analysis of optimization methods in machine learning
机器学习中的最优化算法设计及分析