Data-Driven Optimization

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Abstract

We present several optimization models and algorithms dealing with uncertain, dynamic, structured and/or massive data. Specifically, we discuss • Distributionally Robust Optimization Models, where many problems can be efficiently solved when the associated uncertain data possess no priori distributions; • Near-Optimal Online Linear Programming Algorithms, where the constraint matrix is revealed column by column along with the objective function and a decision has to be made as soon as a variable arrives; • Least-squares with Nonconvex Regularization, where a sparse or low-rank solution is sought; • Alternating Direction Method of Multipliers (ADMM), where an example is given to show that the direct extension of ADMM for three-block convex minimization problems is not necessarily convergent, and possible convergent variants are proposed.