

题目: Primal Dual Alternating Proximal Gradient Algorithms for Nonsmooth Nonconvex Minimax Problems with Coupled Linear Constraints

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摘要:

Nonconvex minimax problems have attracted wide attention in machine learning, signal processing and many other fields in recent years. In this paper, we propose a primal dual alternating proximal gradient (PDAPG) algorithm and a primal dual proximal gradient (PDPG-L) algorithm for solving nonsmooth nonconvex-(strongly) concave and nonconvex-linear minimax problems with coupled linear constraints, respectively. The iteration complexity of the two algorithms are proved to be  $O(\epsilon^{-2})$  (resp.  $O(\epsilon^{-4})$ ) under nonconvex-strongly concave (resp. nonconvex-concave) setting and  $O(\epsilon^{-3})$  under nonconvex-linear setting to reach an  $\epsilon$ -stationary point, respectively. To our knowledge, they are the first two algorithms with iteration complexity guarantee for solving the nonconvex minimax problems with coupled linear constraints.