数学与系统科学研究院

计算数学所网络学术报告

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报告题目：

Lovász extension and graph cut

邀请人： 于海军 研究员

报告时间: 2021 年 11 月 17 日（周三）

下午 14:00-15:00

报告工具: 腾讯会议（ID: 468 217 763）

入会密码：123456

Abstract：

A firm bridge between discrete data world and continuous math field should be tremendously helpful in data analysis. Along this direction, the Lovász extension provides a both explicit and equivalent continuous optimization problem for a discrete optimization problem, for instance, the Cheeger cut problem. In this talk, we report a set-pair Lovász extension which provides not only an answer to the dual Cheeger cut, anti-Cheeger cut, and max 3-cut problems, all of which cannot be handled by the Lovász extension, but also works for the Cheeger cut and maxcut problems. In particular, the set-pair Lovász extension enlarges the feasible region of resulting equivalent continuous optimization problems from a half space (resulted from the Lovász extension) to the entire space for the Cheeger cut and maxcut problems. On the other hand, it provides new possibilities for designing continuous optimization algorithms for combination problems on the practical side, too. As an illustration, we propose a simple continuous iterative algorithm for the maxcut problem which converges to a local optimum in finite steps. Here 'simple' means the inner subproblem is solved analytically and thus no optimization solver is called. Numerical experiments on G-set demonstrate the performance. In particular, the ratios between the best cut values achieved by the simple iterative algorithm and the best known ones are at least 0.986 and can be further improved to at least 0.997 by a preliminary attempt to break out of local optima.

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