

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Yinyu Ye**

(*Stanford University, USA*)

报告题目:

**The Simplex and Policy Iteration
Methods are Strongly Polynomial for
the Markov Decision Process with
Fixed Discount**

邀请人: 优化与应用研究中心

报告时间: **2010 年 10 月 26 日 (周二)**

下午 16: 00

报告地点: **科技综合楼三层 311**

计算数学所报告厅

Abstract:

We prove that the classic simplex method with the most-negative-reduced-cost pivoting rule (Dantzig 1947) for solving the Markov decision process (MDP) with a fixed discount rate is a strongly polynomial-time algorithm. The result seems surprising since this very pivoting rule was shown to be exponential for solving a general linear programming (LP) problem, and the simplex (or simple policy iteration) method with the smallest-index pivoting rule was shown to be exponential for solving an MDP problem regardless of discount rates. As a corollary, the policy iteration method (Howard 1960) is also a strongly polynomial-time algorithm for solving the MDP with fixed discount, and it was shown to be exponential for solving a un-discounted MDP problem.

欢迎大家参加!