论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索   ◀◀ Previous Articles | Next Articles ▶▶

带强制工期的可中断单机排序问题

钟雪灵[1], 王国庆[2], 程明宝[3]

1. 广东金融学院计算机系, 广州 510520;
2. 暨南大学管理学院, 广州 510632;
3. 广东工业大学管理学院, 广州 510520

Preemptive Scheduling with Deadlines on Single Machine

ZHONG Xueling[1], WANG Guoqing[2], CHENG Mingbao[3]

1. Department of Computer, Guangdong University of Finance, Guangzhou 510520;
2. Department of Business Administration, Jinan University, Guangzhou 510632;
3. School of Management, Guangdong University of Technology, Guangzhou 510520

- 摘要
- 参考文献
- 相关文章

全文: PDF (433 KB)   HTML (1 KB)   输出: BibTeX | EndNote (RIS)   背景资料

摘要 工件带强制工期, 指工件必须在已给定的工期内完工, 不得延迟. 这种环境在实际应用中随处 可见. 如果工件过早提前完工, 意味着工件还需要保管, 将会产生额外费用. 本文讨论了在单机上, 加工带准备时间与强制工期的n个可中断工件, 在机器可空闲条件下, 确定一个工件排序, 使得 提前完工时间和最小. 先考虑了问题的复杂性, 通过奇偶划分问题归约, 证明了其是NP-complete的. 而后, 讨论了加工时间相等的特殊情形, 由于工件不允许延迟, 问题可能会无可行排序, 因此提出了 一个多项式时间算法, 既能判定可行性, 又能针对可行问题获得最优排序.

关键词： 单机排序   准备时间   强制工期   空闲时间   提前完工时间和

Abstract： The scheduling problem with deadlines requires that each job have to be completed before or on the given due date, namely no tardiness. It can be seen everywhere in practical application. The earliness means the finished jobs need to stored and lead to extra holding cost unavoidably. Based on that, this paper discusses the problem that n jobs with their own release times and deadlines have to be processed on single machine considering the idle insert. The objective is to find a preemptive job sequence so as to minimize the total earliness. The computational complexity is considered firstly, and the problem is proved NP-complete through the induction of even-odd partition problem. Then, the special case of common processing time is discussed. Since tardy jobs are prohibited, it's possible that there is no feasible sequence for the problem. We develop a polynomial time algorithm to test feasibility and achieve optimality for the feasible problem.

Key words： single machine scheduling   release time   deadline   idle time   total earliness

引用本文：

钟雪灵,王国庆,程明宝. 带强制工期的可中断单机排序问题[J]. 应用数学学报, 2012, (1): 108-120.

ZHONG Xueling,WANG Guoqing,CHENG Mingbao. Preemptive Scheduling with Deadlines on Single Machine[J]. Acta Mathematicae Applicatae Sinica, 2012, (1): 108-120.

服务

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- E-mail Alert
- RSS

作者相关文章

- 钟雪灵
- 王国庆
- 程明宝

[1] Conway R W, Maxwell W L, Miller L W. Theory of Scheduling. Reading, MA: Addison-Wesley, 1967

[2] Garey M, Tarjan R, Wilfong G. One-processor Scheduling with Symmetric Earliness and Tardiness Penalties. *Mathematics of Operations Research*, 1988, 13: 330-348

[3] Baker K, Scudder G. Sequencing with Earliness and Tardiness Penalties: a Review. *Operations Research*, 1990, 38: 22-36

[4] Qi X, Tu F S. Scheduling a Single Machine to Minimize Earliness Penalties Subject to the SLK Deadline Determination Method. *European Journal of Operational Research*, 1998, 105: 502-508

[5] Chand S, Schneeberger H. Single Machine Scheduling to Minimize Weighted Earliness Subject to No Tardy Jobs. *European Journal of Operational Research*, 1988, 34: 221-230

[6] Pathumnakul S, Egbelu P J. Algorithm for Minimizing Weighted Earliness Penalty in Single-machine Problem. *European Journal of Operational Research*, 2005, 161: 780-796

[7] Valente J M S. Local and Global Dominance Conditions for the Weighted Earliness Scheduling Problem with No Idle Time. *Computers and Industrial Engineering*, 2006, 51: 765-780

[8] Kanet J J, Sridharan V. Scheduling with Inserted Idle Time: Problem Taxonomy and Literature Review. *Operations Research*, 2000, 48 (1): 99-110

[9] Mandel M, Mosheiov G. Minimizing Maximum Earliness on Parallel Identical Machines. *Computers and Operations Research*, 2001, 28: 317-327

[10] Garey M R, Johnson D S. Computers and Intractability: A Guide to the Theory of NP Completeness. New York: Freeman, 1979

[1] 邢文训. 在线约束单机排序问题的启发式算法[J]. 应用数学学报, 1998, 21(4): 0-0.