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SYSTEM ENGINEERING

# 基于遗传算法求解以最大利润为目标的间歇生产过程调度问题

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摘要 The optimal scheduling of multi-product batch process is studied and a new mathematics model targeting the maximum profit is proposed, which can be solved by the modified genetic algorithm (MGA) with mixed coding (sequence coding and decimal coding) developed by us. In which, the partially matched crossover (PMX) and reverse mutation are used for the sequence coding, whereas the arithmetic crossover and heteropic mutation are used for the decimal coding. In addition, the relationship between production scale and production cost is analyzed and the maximum profit is always a trade-off of the production scale and production cost. Two examples are solved to demonstrate the effectiveness of the method.

关键词 遗传算法; 批生产工艺; 生产计划; 成本控制; 计算方法;
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## A Genetic Algorithm-based Approach to Scheduling of Batch Production with Maximum Profit

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**Abstract** The optimal scheduling of multi-product batch process is studied and a new mathematics model targeting the maximum profit is proposed, which can be solved by the modified genetic algorithm (MGA) with mixed coding (sequence coding and decimal coding) developed by us. In which, the partially matched crossover (PMX) and reverse mutation are used for the sequence coding, whereas the arithmetic crossover and heteropic mutation are used for the decimal coding. In addition, the relationship between production scale and production cost is analyzed and the maximum profit is always a trade-off of the production scale and production cost. Two examples are solved to demonstrate the effectiveness of the method.

**Key words** production scheduling; batch process; combinatorial optimization; genetic algorithm;

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