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系统工程

完成时间限制下的任务—平台关系设计模型及算法

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摘要：

针对指挥控制组织结构设计中任务—平台关系的设计问题，提出了一种使命完成时间限制条件下的问题的设计模型及其求解算法。分析了使命完成时间限制条件下任务—平台关系设计(task platform relation design under mission completion time constraint, TPRDTC)问题的约束条件，建立了以使命执行质量的值最大为目标的问题数学模型。设计了用于求解该模型的循环多动态列表规划(multi-dimensional dynamic list scheduling, MDLS)算法，给出了该算法的详细步骤和流程。最后通过一个联合作战的战役案例，分析并验证了循环MDLS算法对求解TPRDTC问题的有效性和适用性。

关键词： 运筹学 指挥控制组织 任务—平台关系设计 使命完成时间限制 循环多动态列表规则算法 成对交换

Task platform relation design model and its algorithm under completion time constraint

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Abstract:

To solve the designing problem of task platform relation in the design of command and control organizational structure, a designing model and its solving algorithm under mission completion time constraint are presented. The constraints for the problem of task platform relation design under mission completion time constraint (TPRDTC) are analyzed, and the mathematical model with the value of mission implementation quality maximization objective for TPRDTC is built. Then the circulative multi-dimensional dynamic list scheduling (MDLS) algorithm to solve this model is design, and the detailed step and flow of this algorithm are offered. Finally, the validity and applicability of this algorithm are illuminated by a case of joint campaign.

Keywords: operations research command and control(C2) organization task platform relation design mission completion time constraint circulative multi-dimensional dynamic list scheduling (MDLS) algorithm pairwise exchange (PWE)

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