

Duration Oriented Resource Allocation Strategy on Multiple Resources Projects under Stochastic Conditions [★]

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Abstract

Previous developments from the first author and other researchers were made on devising models for the total cost optimization of projects described by activity networks under stochastic conditions. Those models only covered the single resource case.

The present paper will discuss the case of multiple resources. More precisely, we introduce a strategy of allocation of those resources in order to minimize the waste arising from their latent idleness on their consumption within the same activity. With this strategy we will start from the possible durations yielded by each resource and devise the allocation vector leading to equal durations.

Key words: Project Management and Scheduling, Stochastic Activity Networks, Resource Allocation, Multiple Resources

List of Acronyms

RCPSP: *Resource Constraint Project Scheduling Problem*

AoA: *Activity-on-Arc*

r.v.: *random variable*

DP: *Dynamic Programming*

EMA: *Electromagnetic Algorithm*

EVA: *Evolutionary Algorithm*

SRPCO: *Single Resource Project Cost Optimization*

MRPCO: *Multiple Resources Project Cost Optimization*

DORAS: *Duration Oriented Resource Allocation Strategy*

WBRAS: *Waste Balance Resource Allocation Strategy*

1 Introduction

This paper follows the research made by several contributions starting with the research by the first author (see [1]). These works address a version of the RCPSP (*Resource Constraint Project Scheduling Problem*) in which we wish to determine the optimal allocation of resources to the project's multimodal activities that minimizes the total project cost under stochastic conditions.

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