

The Resource-Constrained Project Scheduling Problem with Stochastic Activity Durations

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Abstract

The resource-constrained project scheduling problem (RCPSP) has been widely studied. Most of the literature focuses on the deterministic RCPSP with minimum-makespan objective. A fundamental assumption of the deterministic RCPSP is that activity durations are known in advance; they are certain. In reality, however, this is almost never the case. In this article, we illustrate why it is important to incorporate activity duration uncertainty, and develop an exact procedure to solve the stochastic resource-constrained scheduling problem (SRCPSP). A computational experiment shows that our approach works best when solving small-to medium-sized problem instances where activity durations have a moderate-to-high level of variability. For this setting, our model outperforms the existing state-of-the-art.

Keywords

Project management, scheduling, RCPSP, stochastic activity durations, resource constraints

Biography

Creemers Stefan is currently working as an Associate Professor at IESEG School of Management (Lille, France) and has a visiting position at KU Leuven (Leuven, Belgium). He holds a PhD in Operations Management from KU Leuven and has earned several master degrees. His research has won multiple awards and he is recognized for his excellent teaching. His research interests include queueing theory, project management, scheduling, and inventory management. He is passionate about business games and develops them himself. He has worked together with a number of international companies and is a member of several organizations.