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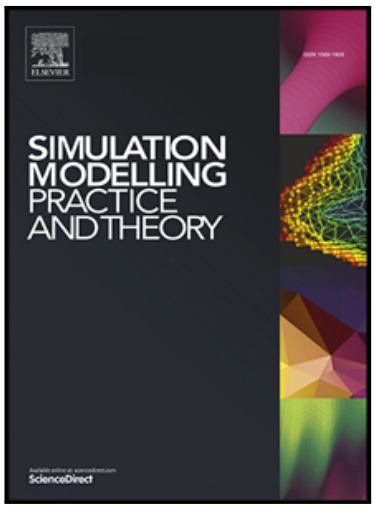

An Agent-based Simulation System for Multi-Project Scheduling under Uncertainty

Wen Song, Hui Xi, Donghun Kang, Jie Zhang

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An Agent-based Simulation System for Multi-Project Scheduling under Uncertainty

Wen Song[a,*], Hui Xi[b], Donghun Kang[a], Jie Zhang[c]

[a] *Rolls-Royce@NTU Corp Lab, Nanyang Technological University, Singapore*
[b] *Rolls-Royce Singapore Pte Ltd, Singapore*
[c] *School of Computer Science and Engineering, Nanyang Technological University, Singapore*

Abstract

This work proposes an agent-based simulation system to address challenges in resource constrained multi-project scheduling under uncertainty. The system aims at helping users develop robust schedules by taking care of intra- and inter-dependencies between projects, conflicting demands for limited resources, and the potential knock-on effect of unpredictable events. With the interactive graphical user interface embedded in the system, users are enabled to investigate project process, evaluate modified schedule, forecast impact resulted from unexpected disruptions, and conduct various what-if analysis. Reactive and proactive scheduling algorithms have been developed in the simulation system to resolve unforeseen disruptions and increase the robustness of the solutions. Experiments on a real-world case study of a technology-intensive industrial product development program have been conducted to evaluate the effectiveness of the proposed algorithms.

Keywords: Agent-based modeling, Interactive simulation platform, Dynamic project scheduling

*Corresponding author
Email addresses: songwen@ntu.edu.sg (Wen Song), hui.xi@rolls-royce.com (Hui Xi), donghun.kang@ntu.edu.sg (Donghun Kang), zhangj@ntu.edu.sg (Jie Zhang)

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