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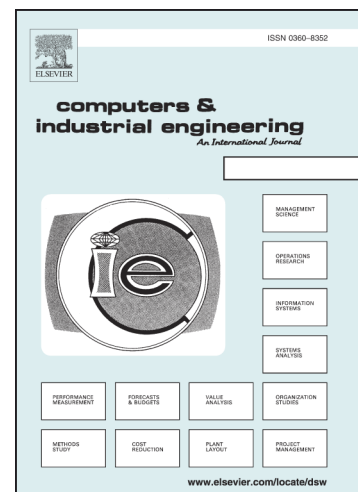
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Single Machine Scheduling with Periodic Machine Availability

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Abstract

In this paper we address the problem of scheduling jobs on a single machine with cyclical machine availability periods. In this problem, the scheduling horizon is composed of periods where the machine is available followed by other periods where no operation can be performed. In the literature, the problem is denoted as scheduling with periodic maintenance, as it is usually assumed that these unavailability periods are employed to perform maintenance activities. Another situation is the one inspiring our research, i.e. the need of completing manufacturing operations within a shift. More specifically, we focus the single machine scheduling problem with makespan objective subject to periodic machine availability. There are several contributions proposing approximate procedures due to the NP-hardness shown for the problem. However, we are not aware of a computational evaluation among these procedures. Furthermore, the problem is similar to the classical bin packing problem, so it is of interest to explore the relation between both problems. In this paper, we address these two issues, and propose new approximate solution procedures for the problem.

Keywords: Single machine scheduling, makespan, Heuristics, periodic maintenance, periodic machine availability

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