Abstract

Multi-Objective Non-Unit Based Repetitive Activities Project Scheduling using Genetic Algorithms

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Achieving a successful construction project, one should meet decision maker various needs and objectives through a construction plan and schedule. A schedule that utilizes the use of resources to achieve minimum construction cost as well as minimum construction duration. In this study, a repetitive activities project scheduling and optimization model is developed to achieve the decision maker objectives.

The proposed scheduling model optimizes the project cost, duration, crews' interruptions and units' delivery dates delay simultaneously. The model consists of two modules; a scheduling module and an optimization module. The scheduling module takes into consideration the logical and resource start dates, different units' quantities, different production rates for assigned construction methods, as well as the transportation duration and cost of moving crews to schedule a repetitive activity project. The optimization module uses a Multi-Objective Genetic Algorithms to define a set of non-dominated solutions for the decision maker to choose from depending on the construction project conditions.

The model is implemented a computer program and introduced to several examples and case studies to evaluate its fitness through analysing the results. It was found fit and applicable on medium size repetitive activities projects.

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