Intelligent Scheduler: An Interactive Driver Scheduling System Based on the ZEST Algorithm

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Abstract

As a rough overview, public transport problem is usually consisted of four subproblems, timetabling, vehicle scheduling, driver scheduling and rostering. Public transport driver scheduling is a complex problem due to the following reasons: (1) it contains a large set of labor constraints; (2) it needs to manage a large set of data. (3) it is NP-hard[1]. To date, scientists and researchers have done varies of researches on this issue. A number of algorithms are presented to solve this problem. Some of these algorithms have used mathematical modeling method, for example Branch and Bound[2], while others employ greedy algorithms such as genetic algorithm[3] and heuristics[4].

This paper describes the design and implementation process of an interactive driver scheduling system which is called intelligent scheduler. The intelligent scheduler aims helping manual schedulers in solving driver scheduling problems properly within relative low driver resource costs. The system is a stand-alone application developed by Java. In the respect of GUI (graphic user interface) part, it is developed by Java Swing. As an intelligent system, the system is developed with a set of functionalities, which mainly based on the algorithm ZEST[5]. It is a heuristic approach with the key features of selecting relief points and building meal break chain. According to this algorithm, the intelligent features, like constraints control as well as intelligent adviser, are implemented in the system.

Keywords: public transport, driver scheduling, interactive system, intelligent scheduling.