

Applying intelligent technique to railway scheduling

Rail transportation is faced with criticism due to it's attributed to not having a proper scheduling system in place. Although developed countries use state-of-the-art technology solutions for railway scheduling, most third world countries, including Sri Lanka still perform railway scheduling manually. This project proposes an automated solution to railway scheduling using Genetic Algorithms.

For railway scheduling, alternate methods of optimization are to use the experience of the dispatchers in creating schedules, or to use a conventional database approach, which consists of past schedules from which queries could be made to determine the optimal schedules from the available schedules. Due to the non-algorithmic nature of railway scheduling, the use of an Artificial Intelligent technique such as Genetic Algorithms provides the best method of optimisation.

The problem domain considered is a single, one-way track linking two major stations, with several intermediate stations in between. The number of trains available for allocation and the commuter demand for each route is determined prior to making the schedule. Based on the commuter demand, the number of trains for each route is allocated. The system has been developed to model a schedule for a given day as a chromosome consisting of the schedule for all the trains allocated for the day. The chromosome consists of five genes representing the Departure Time, Arrival Time, Speed of Train, headway (time-distance between two consecutive trains) and the TRai Type. Once the Chromosome structure has been constructed, the full life cycle of Genetic Algorithms is applied until the optimal schedule is generated. The output is the schedule, including passing times of intermediate stations. The system output can be made available to the Dispatchers and also on the web for commuter information inquiries. The system has been developed using Microsoft Visual Basic and implemented for use on a Microsoft windows 98/NT platform.