TRAIN TIME SCHEDULING USING GENETIC ALGORITHM

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ABSTRACT

Scheduling the train is a big problem in front railways. Scheduling means allocation of resources that falls in NP hard class of problem. Scheduling the trains so that they arrive at correct time is a big task for the employees of railways. It is very important to schedule the train correctly as it is a very sensitive issue related with consumers. Scheduling takes weeks and months and after considering several feedbacks, it is fixed. We propose a technique that will make the scheduling task comparatively easier by using a Genetic Algorithm. We can create a program that employs genetic algorithm to do the scheduling task.

Key words: Genetic Algorithm, Crossover, Chromosome, Time table.


1. INTRODUCTION

Genetic algorithms can be applicable to broad range of empirical problems with extremely useful results. Genetic algorithms provide objectively comprehensible approach to address, extensive scope inappropriate engineering and optimization with difficulties producing optimal results. The role of genetic algorithms is to identify fitter chromosomes can be reached until GA cannot do better.

We have a wide variety of solutions for a stated problem, in which this solution comes with variation and reunion producing new approach and various approaches repeated over generations. Each solution is allocated to the fitter and fitness value to the peculiar individual which has a high chance to yield and mate more fitter one’s.

GA are widely used in performing best random local search by trying different random solutions and keeps on tracking the best one. It is advantageous in providing derivative information available in real world problem space, fastest and efficient contemporary
methods, parallel abilities and which optimizes continuous and discrete functions in solving the problems.

2. RELATED WORK
Timetable arises many problems in real world circumstances similar to nurse rostering described by Burke et al [1], university timetable [3] and timetable prepared by sports [2]. As general timetable deals with many problems in scheduling evident number of occurrences (meetings, courses, exams and different scheduling etc) into a restricted numbers of timetables by satisfying many constraints in fulfilling desired requirement [4].

The timetables related with many problems have being discussed since many decades in which huge amount of research has being taken place timetabling which includes evolutionary algorithm approaches [5,6]. Timetables which includes many problems in preparing for exams like scheduling invigilators, courses and rooms for a time slot or time period within a week or month over many years [7,8].

The method of classifying objects selectively like breeding those objects to each other to introduce new objects which to be classified example the programs which deals with the patterns of birth, mating and the death of life which forms within the natural selections [9].

Genetic algorithms are province problems evolving with many principles based on random mutation and natural selection. The problems in solving particular problems which involves with huge irregular space in searching the possible solutions [10, 11].

3. PROPOSED SYSTEM
These are the components of scheduling
N Drivers d1, d2, d3, …, dk and
O Out-going stations o1, o2, o3, …, ol and
I In-coming stations s1, s2, s3, …, sl and
T Time t1, t2, t3, …, tp

A GA needs to be initialized, mutated, killed, selected and also requires breeding. The step of initialization generates arbitrary population of probable solution. For making the schedule, we need to consider first those trains that are not required to be scheduled every day. These trains are selected in random order along with time and are allocated to stations. The fettle function of each chromosome is calculated using Kdriv and Kstn to identify how many drivers likes to drive the train to those stations. The evaluation function is calculated using the formula

\[ \text{cal}(y) = \frac{1}{1+f} \]

where f is the sum of weighted mortification.

In selection, a portion of existing population is selected, making them to breed to generate a new set of population. In case of mutation we select a time table ‘d’ for mutation. In this a set of natural number n and a set [] subset of K set of time.

The Genetic Algorithm is implemented that will operate on train schedules maintained in memory. The GA is implemented in C and is tested each time the GA violates its constraints.
4. CONCLUSIONS

The problems which are related in real world mostly related with analyzing and applying mathematics which involving hard in dealing with simplifications, restrictions and idealizations then here comes with solving the problems and certainly standoff with drawing conclusions with real world problems and solutions.

This paper comes up with research which is concentrated in scheduling or making timetabling for trains scheduling in railways by solving problems using genetic algorithm. This paper comes up with solving powerful method in scheduling timetabling in railways in solving by conventional method over a period or for a specific time. The problems can be eliminated by making use of fitter and fitness functions which have been provided by genetic algorithm with various genetic operators which includes mutation, crossovers and selection which enhance in resulting various aspects through selection which select chromosomes along with cross over by exchanging information for solving railways timetables as per requirements. This paper come up with a technique that will make the scheduling task comparatively by using a Genetic Algorithm.

REFERENCES

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