Abstract

This paper presents a genetic algorithmic approach to the solution of the problem of personnel timetabling in laboratories in which the objective is to assign tasks to employees and nurse scheduling in medical centre where the objectives are to assign staff to particular day in planning period and minimization of personnel cost by avoiding overtime pay. The personnel scheduling and timetabling problems are multi-constrained and having huge search space
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which makes them NP hard. Genetic algorithmic approach is applied to both the problems. Canonical genetic algorithm demonstrates very slow convergence to optimal solution. Hence, in laboratory personnel timetabling problem a knowledge augmented operator is introduced in genetic algorithm framework. This hybridization helps to get the near-optimal solution quickly. For nurse scheduling problem, proposed hybrid genetic algorithms with partial feasible chromosome representation, initialization and operators have shown fast convergence towards optimal solution with comparatively small population size. The probability of getting near optimal solution using proposed hybrid genetic algorithm in less than 20 seconds (the average time) is more than 0.6. Timetabling and scheduling problems under consideration are quite different from each other. Hence choice of genetic operators and parameters for both the problems are different. Finding a general framework for timetabling and scheduling problems is still a challenge.

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Index Terms

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