Hybrid Algorithms (Learning Automata + Genetic Algorithm) for Solving Graph Bandwidth Minimization Problem

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Abstract: In this paper, three approximate algorithms based on learning automata and genetic algorithm for solving the graph bandwidth minimization problem have been proposed. The first algorithm is based on object migrating learning automata, the second algorithm is obtained from combining object migrating learning automata and genetic algorithm, and the third algorithm is obtained by combing variable structure learning automata and genetic algorithm. These algorithms are tested on a set of 113 real benchmark instances and the results obtained are compared with the results obtained for several existing algorithms. The result of comparisons shows that the proposed algorithms perform better than the existing algorithms. It is shown that integrating learning automata and genetic algorithm as it is done in one of the proposed algorithm accelerates the searching process and also prevents the algorithm from getting stuck in local optimal.

Keywords: Learning Automata, Genetic Algorithm, Graph Bandwidth Problem, Hybrid Algorithm