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DESIGNING A NEW STRUCTURE BASED ON LEARNING AUTOMATON TO IMPROVE EVOLUTIONARY ALGORITHMS (WITH CONSIDERING SOME CASE STUDY PROBLEMS)

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Evolutionary algorithms are some of the most crucial random approaches to solve the problems, but sometimes generate low quality solutions. On the other hand, Learning automata are adaptive decision-making devices, operating on unknown random environments, So it seems that if evolutionary and learning automaton based algorithms are operated simultaneously, the quality of results will increase sharply and the algorithm is likely to converge on best results very quickly.
This paper contributes an algorithm based on learning automaton to improve the evolutionary algorithm for solving a group of NP problems. It uses concepts of machine learning in search process, and increases the efficiency of evolutionary algorithm (especially genetic algorithm). In fact, the algorithm is prevented from being stuck in local optimal solutions by using learning automaton. Another positive point of the hybrid algorithm is its noticeable stability since standard division of results, which is obtained by different executions of algorithm, is low; that is, the results are practically the same. Therefore, as the proposed algorithm is used for a set of well-known NP problems and the results are very suitable it can be considered as a precise and reliable technique to solve the problems.

Keyword: LEARNING AUTOMATON, GENETIC ALGORITHM, HYBRID ALGORITHM, NP PROBLEMS

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