A Hybrid Algorithm for Solving Steiner Tree Problem

Abstract

In this paper, a hybrid algorithm based on modified intelligent water drops algorithm and learning automata for solving Steiner tree problem is proposed. Since the Steiner tree problem is NP-hard, the aim of this paper is to design an algorithm to construct high quality Steiner trees in a short time which are suitable for real time multicast routing in networks. The global search and fast convergence ability of the intelligent water drops algorithm make it efficient to the problem. To achieve better results, we used learning automata for adjusting IWD parameters. IWD has several parameters. The appropriate selections of these parameters have large effects on the performance and convergence of the algorithm. Experimental results on the OR-library test cases show that the proposed algorithm outperforms traditional heuristic algorithms and other iteration based algorithms with faster convergence speed.

References

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**Index Terms**

Computer Science  
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**Keywords**  
Intelligent Water Drops Algorithm; Steiner Tree Problem; Learning Automata; Parameter Adaptation