عنوان مقاله:

Hierarchical Coverage Repair Policies Optimization by Dhouib-Matrix-۴ Metaheuristic for Wireless Sensor Networks using Mobile Robot

نویسنده:

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خلاصه مقاله:

The wireless sensor networks represent a wide range of potential application, they are composed of a set of energy-constrained sensors used for detecting events and then sending information. In this paper, the novel metaheuristic Dhouib-Matrix-۴ (DM۴) is enhanced to optimize the coverage repair policies for wireless sensor networks using a mobile robot with different moving speeds. Hierarchically, two conflicted criteria are considered: at first the number of sensors to be visited in time is maximized, then at second, the trajectory distance of the mobile robot is minimized. Therefore, maximizing the lifetime of sensors and minimizing the path of the mobile robot is a challenging issue. DM۴ is a multi-start method which uses at each start the novel greedy heuristic Dhouib-Matrix-TSP۱ in order to generate an initial basic feasible solution which will be intensified by the new local search technique entitled Far-to-Near. DM۴ is applied on several TSP-LIB standard instances from the literature where the moving speed (w) of a mobile actor varied from ۰.۴ to ۱. The performance of DM۴ is proven by comparing its results to those generated by the Evolutionary Algorithm (EA). DM۴ is developed under Python programming language and a graphical representation of the generated solution is illustrated.

کلمات کلیدی:

Wireless Sensor Networks, Artificial intelligence, optimization, Metaheuristic, Coverage Repair Policies, Mobile Robot

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