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Summary: Aiming at the problem of UAV path planning, an improved artificial bee algorithm was proposed. On the one hand, in the employed bees stage, two different search formulas were used to obtain two sets of solutions, which increased the diversity of solutions. At the same time, dual cognitive capabilities and weight factor were added to balance the exploration and exploitation ability of the algorithm. On the other hand, in the scout bees stage, the tabu search strategy was adopted to store the local optimal solution in the tabu table, which helped the algorithm to jump out of the local optimal. The effectiveness of this algorithm was verified through 5 benchmark function tests. At the same time, the algorithm was applied to the simulation of the path planning under different threat areas. The experimental results showed that the path solved by the algorithm had shorter distance, smoother path. The advantages such as avoiding threats could speed up the convergence speed of the path solution, and improve the efficiency and stability of path planning.

MSC:

68T20 Problem solving in the context of artificial intelligence (heuristics, search strategies, etc.)

Keywords:
path planning; artificial bee colony algorithm; local search; weight factor; tabu search strategy

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