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论文

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基于启发式蚁群算法的协同多目标攻击空战决策研究

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Research on Air Combat Decision-making for Cooperative Multiple Target Attack Using Heuristic Ant Colony Algorithm

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摘要

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摘要 协同多目标攻击空战决策是现代战机在超视距条件下进行协同空战的关键技术之一。它是寻求一个优化分配方案,将目标分配给各友机,力求使攻击效果最优。本文在对协同多目标攻击战术进行深入分析的基础上,提出了一种用于空战决策的启发式蚁群算法,该算法通过求解友机导弹对目标的最优分配来确定空战决策方案。仿真实验表明所提出的启发式蚁群算法对最优解的搜索效率明显优于基本蚁群算法,是一种求解协同多目标攻击空战决策问题的有效算法。

关键词: 空战决策 协同空战 多目标攻击 启发式 蚁群算法

Abstract: The air combat Decision-Making (DM) for Cooperative Multiple Target Attack (CMTA) is one of the key techniques for modern fighters performing cooperative air combat under the Beyond Visual Range (BVR) condition. It is to find a proper assignment of the friendly fighters to the hostile fighters to achieve the optimal attack effect. In this paper, based on the deep analysis of the CMTA tactics, a Heuristic Ant Colony Algorithm (HACA) is proposed to solve the DM problem. The HACA obtains the DM solution by searching for the optimal assignment of the missiles of the friendly fighters to the hostile fighters. Simulation results show that the search efficiency of the proposed algorithm is obviously superior to that of basic Ant Colony Algorithm (ACA). It is an effective algorithm to deal with the DM problem for CMTA in air combat.

Keywords: air combat decision-making cooperative air combat multiple target attack heuristics ant colony algorithm

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