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论文

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### 应用自适应遗传算法进行参考航迹规划

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### Aircraft Referenced Flight Path Planning by Using Adaptive Genetic Algorithms

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摘要

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**摘要** 确定参考航迹是利用分层规划思想进行航迹规划时首先要解决的问题。针对参考航迹规划算法中全局最优和信息处理量之间的矛盾, 采用自适应遗传算法进行参考航迹规划。算法对飞行方向进行编码构造个体, 并在此基础上设计交叉和变异算子; 在进化过程中采用自适应交叉概率和变异概率。仿真结果表明, 该方法大大降低了信息的记忆和处理量, 并提高了遗传算法的全局寻优能力, 为突防飞行器提供满足战术要求的参考航迹。

**关键词:** 飞行轨迹 遗传算法 最佳化 自适应 低空突防

**Abstract:** The referenced flight path should be firstly determined in hierarchical flight path planning. To resolve the conflict between global optimization and information processing in the algorithm of referenced path planning, this paper develops an adaptive genetic algorithm to the referenced path planning. In the algorithm the chromosome is constructed by a sequence of flight directions, on the basis of which the crossover operator and mutation operator are redesigned. In the process of evolution, the adaptive crossover probability and mutation probability are developed. The numerical application demonstrates that the proposed method reduces the memory and processing of information and improves the global optimization ability of the genetic algorithm. The proposed method can provide penetration vehicles with a referenced flight path satisfying the tactics requirement.

**Keywords:** flight paths genetic algorithm optimization adaption low altitude penetration

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