优化的 A*算法在航迹规划上的应用

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摘 要：针对无人机航线规划问题，基于 A-Star 启发式搜索算法，提出一种通过二叉堆优化的新的航迹规划算法. 相对于以往的航迹规划算法而言，此算法重新规划了威胁模型，并且根据飞行器自身性能的限制，重新设计了成本函数和启发函数，并对 A-Star 算法进行了优化，同时对最终结果进行了平滑处理.与原算法相比，其提高了搜索效率，提高了搜索速度，减少了内存消耗，并且更加具有现实可利用的意义.实验结果也显示这种算法可以使飞行器在性能允许的范围以内，绕过威胁区域，快速地寻找到到达目的点的最佳路径.

关键词： A-Star；二叉堆优化；成本函数；威胁模型；偏转角阈值

Optimization of the Application of A * Algorithm in Path Planning

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Abstract：This article mainly for unmanned aerial vehicle (UAV) route planning problem, based on A – Star heuristic search algorithm, an optimized by binary heap new path planning algorithm. In this article, compared with the previous route planning algorithm, we rethink the threat model, and according to the aircraft's own performance limit, redesigned the cost function and heuristic function. And A – Star algorithm is optimized, in the final and the final result for the smooth processing. The optimized algorithm is compared with the original algorithm greatly improve the search efficiency, improves the search speed, reduce the memory consumption, available and more realistic significance. Experimental results also show that the algorithm can make the aircraft in the allowed scope of the aircraft in the performance , bypass the threatened area, quick to find the best route the destination point.

Key words：A-star; binary heap of optimization; the cost function; threat model; deflection angle threshold

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