

عنوان مقاله:

Aircraft conflict resolution in free flight environment Based on genetic algorithm

محل انتشار:

هفتمین همایش انجمن هوافضای ایران (سال: 1386)

تعداد صفحات اصل مقاله: 7

نویسندگان:

M.B Malaek - *Aerospace Department, Sharif University of Technology, Azadi Ave, Tehran, Iran, Professor of
, Aerospace Engineering Department*

.A Alaeddini - *M.Sc student of Aerospace Engineering*

خلاصه مقاله:

Airspace congestion is today the most critical issue that Air Traffic Management (ATM) has to face. The safety of flights and in particular, separation assurance is one of the main tasks of air traffic control (ATC). Conflict resolution refers to the process used by ATCs to prevent loss of separation. Conflict resolution involves issuing instructions to aircraft to avoid loss of safe separation between them and, at the same time, direct them to their destinations. In this paper, the problem of designing optimal conflict-free maneuvers for multiple aircraft encounters situations on a plane is studied. The proposed maneuvers are based on changes of heading. Most of the recently proposed CD&R algorithms typically attempt to resolve impending conflicts while minimizing trajectory deviations, fuel usage or flight time. In this paper, the optimality of maneuvers among the conflict-free constraint is based on minimization of a certain cost function based on fuel consumption of either aircraft involved. The advantage of the optimization method based on genetic algorithm is its simplicity compared with analytical methods. This simplicity causes the resolution of conflicts with large number of aircrafts. Some suitable priority weight factors are incorporated into the cost function so that optimal resolution maneuvers are such that aircraft with lower priorities assume more responsibility in resolving the conflicts. The maneuvers are simple, and are consisted of 3 straight lines with constant speed and one coordinated turn (with constant speed and constant altitude). So, these maneuvers do not result in any problems for pilots to follow. The purpose of this paper is to obtain a set of maneuvers to cover all possible conflict scenarios involving multiple aircraft. Fairly thorough simulations have been done to evaluate the effectiveness of the methodology, while some are presented here to illustrate the effectiveness of the proposed algorithms for real time .conflict resolution

کلمات کلیدی:

conflict resolution-free flight-horizontal plane-optimization

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/55422>



