航空学报
ACTA AERONAUTICA ET ASTRONAUTICA SINICA
ISSN 1000-6893
CN 11-1929/V

航空学报 » 1984, Vol. 5 » Issue (3) :296-304 DOI:

机动多目标跟踪问题中关联区域的研究

周宏仁

中国航空研究院

AN INVESTIGATION OF ASSOCIATION REGION IN MANEUVERING MULTI-TARGET TRACKING

Zhou Hongren

Chinese Aeronautical Establishment

摘要 | 参考文献 | 相关文章

Download: PDF (509KB) HTML 0KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 本文研究了跟踪多个机动目标时,由滤波算法所获得的新息向量范数的统计性质,关联区域的大小以及接收正确回波的概率。借助拉蒙特卡洛方法,考察了不同的目标状态模型、目标机动加速度及状态噪声方差等因素对所研究的问题的影响。研究表明,文献[1]所提出的机动目标状态模型及相应的自适应算法具有较好的适应目标机动的能力,关联区域的大小及接收正确回波的概率均较为稳定。

关键词:

Abstract: This paper deals with the problem of correlation region in the case of one site, maneuvering multi-target tracking. The statistical properties of the norm of the innovation vector, the size of the correlation region and the probability of accepting a correct return are investigated by means of Monte Carlo simulation with three different state models, different maneuvering accelerations of targets and the variance of state noise.In Model I the "current" probability density function of target maneuvering acceleration is described by a modified Rayleigh density with variable mean-value and therefrom an adaptive filtering algorithm for the mean and variance of the maneuvering acceleration is developed.In Model II the maneuvering acceleration of the target is assumed to have an approximately uniform density function in the interval （-amax, amax） where amax is the maximum maneuvering acceleration and a standard Kalman filtering algorithm is used.Model III is a two-state model （only position and velocity of targets are involved） which has been used by several authors for non-maneuvering multi-target tracking.The investigation shows that Model I has the best capability to adapt itself to target maneuvers. The mean and the mean square values of the norm of innovation vector in this model have very good relative stability when the target maneuvers over a wide range. The probability of accepting the correct return and the size of correlation region do not change drastically with the changes of the variance of state noise and of maneuvering accelerations of targets. Therefore, it is not necessary to take any other measures to maintain the probability of correct correlation and the size of correlation region to be constant. In this sense, Model I is very suitable to application in maneuvering multi-target tracking.

Keywords:

Received 1983-09-26;

Service
把本文推荐给朋友
加入我的书架
加入引用管理器
Email Alert
RSS
作者相关文章

引用本文:

周宏仁. 机动多目标跟踪问题中关联区域的研究[J]. 航空学报, 1984, 5(3): 296-304.

Zhou Hongren. AN INVESTIGATION OF ASSOCIATION REGION IN MANEUVERING MULTI-TARGET TRACKING[J]. Acta Aeronautica et Astronautica Sinica, 1984, 5(3): 296-304.

Copyright 2010 by 航空学报