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一种用于机动目标跟踪的新自适应卡尔曼滤波算法

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A NEW ADAPTIVE KALMAN FILTERING ALGORITHM FOR MANEUVERING TARGET TRACKING

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摘要

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摘要 在“当前”模型的概念下,从工程实现的背景出发,提出了一种用于机动目标跟踪的新自适应卡尔曼滤波算法。基本思想是通过对加速度项引入加权因子来进一步突出“当前”信息的作用,为“当前”模型提供更加准确的“当前”信息。蒙特卡罗模拟结果表明,算法不仅克服了“当前”模型自适应卡尔曼滤波算法的缺陷,而且使跟踪性能得到进一步的提高。

关键词: 滤波器 自适应滤波器 机动目标跟踪

Abstract: A new algorithm, weighted “current” model adaptive Kalman filtering algorithm, is suggested. The discrete state equations are extended to a new 3-dimensional spherical coordinate. A weighting factor q is employed to further emphasize the “current” information and to provide more accurate “current” acceleration for “current” model. The comparisons of the new algorithm with those of singer model and “current” model in three channels are conducted through Monte Carlo simulation. The results show that the proposed algorithm not only overcomes the shortcoming of “current” model, but also preserves its advantages and improves its tracking performance. Besides, the new algorithm requires less computations. It is easy for engineering implementation, and so it is very valuable to practical applications.

Keywords: filter adaptive filter maneuvering target tracking

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