

二维分数阶卡尔曼滤波及其在图像处理中的应用

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2D Fractional Kalman Filter and Its Application to Image Process

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摘要

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摘要 该文研究了二维分数阶卡尔曼滤波及其在图像增强与滤波中的应用问题。首先基于分数微积分的定义,建立了二维线性离散系统的分数阶差分状态空间模型。然后,提出了一种可应用于图像信息处理的二维分数阶卡尔曼滤波算法,并通过实验验证了该文提出算法的有效性。仿真结果证明,该算法增强了图像中的细节特征,同时消弱了图像中的背景噪声。

关键词: 图像增强 图像去噪 分数阶离散状态空间 二维分数阶卡尔曼滤波

Abstract: This paper deals with the issue of 2D Fractional Kalman Filter (2DFKF) and its applications to image enhancement and recognition. With the introduction of 2D fractional differential, 2DFKF recursive equation is first presented. Next, a state space model of a image given and, based on this, the 2DFKF algorithm is proposed. Finally, an example is given to demonstrate the effectiveness of proposed algorithm and the simulation result shows that the details of the image are enhanced, while the background noise of the image is efficiently attenuated.

Keywords: Image enhancement Image denoising Discrete fractional state-space systems 2D Fractional Kalman Filter

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