

光电信息获取与处理

一种提高共聚焦显微镜信噪比算法的研究

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摘要:

基于共聚焦显微镜的成像特点,建立了Kalman滤波算法的理论模型,把Kalman滤波方法引入到系统中,提出一种基于图像像素的Kalman滤波算法,并实现了实时化的Kalman滤波器。实验结果表明:该算法能够有效地提高共聚焦显微镜信噪比,但是以牺牲时间为代价,提高系统分辨率的根本方法还是要着重考虑优化成像系统光路和探测电路。

关键词: 共聚焦显微镜 显微成像 Kalman滤波器 信噪比

Algorithm of improving confocal microscope SNR

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Abstract:

A theoretical model for Kalman filtering algorithm is established based on the imaging characteristic of the confocal microscope. The Kalmam filtering algorithm based on the image pixel is proposed and a real time Kalman filter is realized by means of the introduction of Kalman filtering method into the system. The experimental result shows that the algorithm can effectively improve the signal-noise-ratio (SNR) for the confocal microscopy imaging systems, but it is obtained at the expense of time. Therefore, the perfect method to improve the resolution of the system is to emphatically consider the optimization of the beam path of the imaging system and the detection circuit.

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