

Wavelets and splines for vertical scratch removal in old movie sequences

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Abstract

In old movies, scratches are common damages and mostly result from a mechanical stress during the projection. A method for removing vertical scratches is proposed, suitable to be automatically applied to sequences of images. The method uses a wavelet decomposition of the original digital image I in order to separate the high frequency components and to elaborate the data of the scratch region, both in the regular matrix A and in the vertical details matrix V . As to concern A , approximating functions are constructed in suitable spline spaces, which depend on the morphological quality of the image nearby the scratch. Criteria to automatically recognize this quality are given. The identification of the wavelet bases and of the spline parameters is discussed. Monochromatic old images and images with simulated scratches have been considered to validate the method and some examples are finally given.

Keywords Scratch removal, movie restoration, biorthogonal wavelets, spline approximation

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