

Adaptive Multiscale Retinex for Image Contrast Enhancement

李建興, 石昭玲, 連振昌, 韓欽銓

Computer Science & Information Engineering

Computer Science and Informatics

chlee@chu.edu.tw

Abstract

Many people will use digital cameras and camera phones to take images. However, the visual quality (contrast, color rendition, etc.) of some acquired images may be poor due to the limitation of capturing devices or improper illumination conditions, particularly in wide dynamic range scenes. Thus, the images generally consist of both overexposed and underexposed areas. Conventional image enhancement methods may either fail to produce satisfactory and undistorted images, or cannot improve every region of interest appropriately. Single-scale retinex (SSR) and multiscale retinex (MSR), which is defined as a weighted sum of several SSRs, were developed for local image contrast enhancement and dynamic range compression. In this paper, an adaptive multiscale retinex (AMSR) approach will be proposed for image contrast enhancement. In AMSR, the weight associated with each SSR output image is adaptively computed according to the content of the input image in order to produce an enhanced image with natural impression and proper tonal rendition in every region of the image. Experimental results on several low contrast images have shown that our proposed AMSR approach can produce natural and appealing enhanced images.

Keyword : contrast enhancement; multiscale retinex (MSR); single-scale retinex (SSR)