

# Image Contrast Enhancement Using Classified Virtual Exposure Image Fusion

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## Abstract

In our daily life, digital cameras and smart phones have been widely used to take pictures. However, digital cameras and smart phones have a limited dynamic range, which is much lower than that human eyes can perceive. Thus, the photographs taken in high dynamic range scenes often exhibit under-exposure or over-exposure artifacts in shadow or highlight regions. In this study, an image fusion based approach, called classified virtual exposure image fusion (CVEIF), is proposed for image enhancement. First, a function imitating the F-stop concept in photography is designed to generate several virtual images having different intensity. Then, a classified image fusion method, which blends pixels in distinct luminance classes using different fusion functions, is proposed to produce a fused image in which every image region is well exposed. Experimental results on four different kinds of generic images, including a normal image, a low-contrast images, a backlight image, and a dark scene image, have shown that the proposed CVEIF approach produced more pleasingly enhanced images than other methods.

Keyword : Classified virtual exposure image fusion, contrast enhancement, exposure fusion, image fusion