Image Enhancement Approach Using the Just-Noticeable-Difference Model of the Human Visual System

李建興, 林佩瑩, 陳玲慧, 王維綱
Computer Science & Information Engineering
Computer Science and Informatics
chlee@chu.edu.tw

Abstract

People are not always pleasing with the low-contrast images taken by digital cameras or camera phones due to the limitation of capturing devices or improper illumination/exposure conditions. Conventional image contrast enhancement methods may either fail to produce satisfactory and undistorted images, or cannot improve every region of interest appropriately, especially the face regions. In this paper, a histogram equalization (HE) approach exploiting the just-noticeable-difference (JND) model of the human visual system (HVS), denoted by JND-HE, is proposed for generic image contrast enhancement. Further, the proposed JND-HE approach is combined with the exposure correction (EC) method (denoted by JND-HE-EC) for face image enhancement. The proposed JND-HE-EC approach can improve the contrast in face regions and provide proper illumination in the background. Experimental results on both generic images as well as face images have shown that our proposed approach can produce more pleasing and appealing enhanced images than other methods.