Adaptive skin color classification technique for color-based face detection systems using integral image.

Abstract

Among the various features of human face, skin colour is a more powerful means of discerning face appearance. Numerous skin colour models, which model the human skin colours in different ways, have been proposed by researchers. Furthermore, there are a number of colour spaces which are adopted in skin colour modelling. In particular, the colour-based segmentation is a significant step in any colour-based face detection approach which uses skin-colour models to classify an image into skin and non-skin regions. Varying illumination is one of the most frequent challenges in face detection systems. A change in the light source distribution and in the illumination level (indoor, outdoor, highlights, shadows, non-white lights) affects the appearance of an object (such as human face) in a scene and produces changes in terms of object colour and shape. An adaptive skin colour classification technique, which considerably resolves around the above mentioned problems in case of illumination conditions and shadow, has been proposed and presented in this paper. The proposed method first identifies those pixels that have illumination problem using integral image and then the pixels are adjusted using an adaptive gamma intensity correction method to rectify negative effect of illumination problems. The experiments showed that the proposed method significantly improves the process of a color-based face detection system in terms of both detection rate and accuracy.

Keyword: Skin color classification; Color-based; Face detection; Illumination.