

Skin Color Pixel Classification for Face Detection with Hijab and Niqab

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ABSTRACT

Skin color pixel classification in color spaces with respect to threshold values of color components has been widely used in face detection algorithms. Color based face detection becomes difficult when faces are covered with hijab or niqab due to effect of fabric color. Previous studies show that, a variety of color component thresholding approach has been used for skin color pixel classification in different color spaces. This article presents a comparative analysis on skin color pixel classification using RGB and YCbCr color space for hijab and niqab covering faces. Ratio of pixels of skin area to non-skin area has been used as a performance metric in the analysis. The experiment results show that, YCbCr performs better than RGB color space for hijab and niqab with fabric color dissimilar to skin tone. But RGB method outperforms YCbCr when the fabric color is close to skin tone. The findings of this study will be helpful in designing a uniform color component thresholding approach which is robust against fabric color influence.

CCS Concepts

• Computing methodologies~Image processing

Keywords

Skin color; pixel classification; RGB; YCbCr; fabric color; thresholding; face detection; hijab; niqab.