International Journal of Computer and Information Engineering
Vol:8, No:6, 2014

Automatic Facial Skin Segmentation Using Possibilistic C-Means Algorithm for Evaluation of Facial Surgeries

Authors : Elham Alaee, Mousa Shamsi, Hossein Ahmadi, Soroosh Nazem, Mohammad Hossein Sedaaghi

Abstract : Human face has a fundamental role in the appearance of individuals. So the importance of facial surgeries is undeniable. Thus, there is a need for the appropriate and accurate facial skin segmentation in order to extract different features. Since Fuzzy C-Means (FCM) clustering algorithm doesn't work appropriately for noisy images and outliers, in this paper we exploit Possibilistic C-Means (PCM) algorithm in order to segment the facial skin. For this purpose, first, we convert facial images from RGB to YCbCr color space. To evaluate performance of the proposed algorithm, the database of Sahand University of Technology, Tabriz, Iran was used. In order to have a better understanding from the proposed algorithm; FCM and Expectation-Maximization (EM) algorithms are also used for facial skin segmentation. The proposed method shows better results than the other segmentation methods. Results include misclassification error (0.032) and the region's area error (0.045) for the proposed algorithm.

Keywords : facial image, segmentation, PCM, FCM, skin error, facial surgery
Conference Title : ICIPACV 2014 : International Conference on Image Processing, Analysis and Computer Vision
Conference Location : Istanbul, Turkey
Conference Dates : June 19-20, 2014