A Racial Recognition Method Based on Facial Color and Texture for Improving Demographic Classification

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Abstract Facial recognition is one of the important techniques in the security and authentication domain of the present time. Facial image recognition involves complex process which reduces the overall performance of the system for a large database, and consequently, it may incur inefficiency to the system in the commercial sector. In this paper, we split the image database into a set of smaller groups by classifying the face images in terms of race demography. First, facial components (i.e., eyes, nose and mouth) are captured using a segmentation technique and then race sensitive features: chromatic/skin tone and local features from face images are extracted using Color Coherence Vector and Gabor filter. K-Nearest Neighbors, Artificial Neural Network, and Support Vector Machines are then used to classify the face image according to race groups. We consider racial classification as Asian, African and European. It was found that the average classification accuracy with Gabor and CCV features for Artificial Neural Network is 91.74% and 84.18%, respectively, providing plausible results comparing to some other existing models.

Keywords Color Coherence Vector · Gabor filter · K-Nearest Neighbors · Artificial Neural Network · Support Vector Machines

1 Introduction

Race is a classification system used to categorize humans into large and distinct populations or groups by heritable, phenotypic characteristics, geographic ancestry, physical appearance, ethnicity and social status [1, 2].

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