A Multi-Color Based Features from Facial Images for Automatic Ethnicity Identification Model

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Abstract:
Ethnicity identification for demographic information has been studied for soft biometric analysis, and it is essential for human identification and verification. Ethnicity identification remains popular and receives attention in a recent year especially in automatic demographic information. Unfortunately, ethnicity identification technique using color-based feature mostly failed to determine the ethnicity classes accurately due to low properties of features in color-based. Thus, this paper purposely analyses the accuracy of the color-based ethnicity identification model from various color spaces. The proposed model involved several phases such as skin color feature extraction, feature selection, and classification. In the feature extraction process, a dynamic skin color detection is adapted to extract the skin color information from the face candidate. The multi-color feature was formed from the descriptive statistical model. Feature selection technique applied to reduce the feature space dimensionality. Finally, the proposed ethnicity identification was tested using several classification algorithms. From the experimental result, we achieved a better result in multi-color feature compared to individual color space model under Random Forest algorithm.

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