A Comparison of South East Asian Face Emotion Classification based on Optimized Ellipse Data Using Clustering Technique

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Abstract : In this paper, using a set of irregular and regular ellipse fitting equations using Genetic algorithm (GA) are applied to the lip and eye features to classify the human emotions. Two South East Asian (SEA) faces are considered in this work for the emotion classification. There are six emotions and one neutral are considered as the output. Each subject shows unique characteristic of the lip and eye features for various emotions. GA is adopted to optimize irregular ellipse characteristics of the lip and eye features in each emotion. That is, the top portion of lip configuration is a part of one ellipse and the bottom of different ellipse. Two ellipse based fitness equations are proposed for the lip configuration and relevant parameters that define the emotions are listed. The GA method has achieved reasonably successful classification of emotion. In some emotions classification, optimized data values of one emotion are messed or overlapped to other emotion ranges. In order to overcome the overlapping problem between the emotion optimized values and at the same time to improve the classification, a fuzzy clustering method (FCM) of approach has been implemented to offer better classification. The GA-FCM approach offers a reasonably good classification within the ranges of clusters and it had been proven by applying to two SEA subjects and have improved the classification rate.

Keywords : ellipse fitness function, genetic algorithm, emotion recognition, fuzzy clustering

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