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Identifying Facial Expression Using Adaptive Sub-layer Compensation Based Feature Extraction

Xin Guo[a], Yun Tie[a,*], Long Ye[b], Jinyao Yan[b]

[a]*School of Information Engineering, Zhengzhou University, Zhengzhou, China*
[b]*Key Laboratory of Media Audio and Video of Ministry of Education, Communication University of China, Beijing, China*

Abstract

In this paper, an automatic facial expression recognition method is proposed to extract feature from video sequences. First, we modified the Marr-Hildreth detector with Wiener filtering, adaptive sub-layer compensation (ASLC) and hysteresis to alleviate the negative effects of traditional one and then, the deformable elastic body spline (EBS) model is extended by using different Poisson's rate to model the facial muscle fiber, which accommodate the fact that different muscle fiber has a different way of deformation. The ASLC feature and the improved EBS feature are fused together to form the facial feature vector. Further, we utilize the Discriminative Isomap (D-Isomap) approach to embed the facial feature into a low dimensional space. The final decision is made by computing the nearest class center of the feature space. RML Emotion database and Cohn-Kanade (CK) database are both used for the experiment and the results demonstrate the effectiveness of the proposed method.

Keywords: Marr-Hildreth detector, adaptive sub-layer compensation, elastic body spline, Discriminative Isomap

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*Corresponding author
Email addresses: guoxin19880806@163.com (Xin Guo), ieytie@zzu.edu.cn (Yun Tie), yelong@cuc.edu.cn (Long Ye), jyan@cuc.edu.cn (Jinyao Yan)

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