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Understanding Discrete Facial Expression in Video Using Emotion Avatar Image

Abstract - Existing video based facial expression recognition techniques analyze the geometry based and appearance based information in every frame as well as explore the temporal relation among frames. On the contrary, we present a new image-based representation and associated reference image called Emotion Avatar Image (EAI), and Avatar Reference, respectively. This representation is not only robust to outliers but also provides a method to aggregate dynamic information from expression with various lengths. The approach for facial expression consists of the following steps: (a) face detection; (b) face registration of video frames with the Avatar Reference to form the EAI representation; (c) computation of features from EAIs using both Local Binary Patterns (LBP) and Local Phase Quantization (LPQ); and (d) classifying the feature as one of the emotion type using a linear Support Vector Machine (SVM) classifier. Our system is tested on the Facial Expression Recognition and Analysis Challenge (FERA2011) data, GEMEP-FERA dataset. The experimental results demonstrate that the information captured in a EAI for a facial expression is a very strong cue for emotion inference. Moreover, our method suppresses the person-specific information for emotion, and performs well on unseen data.