

Finding emotions in a crowd

Real Time, Fully Automatic Coding of Facial Expressions from Video.

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We present results on a user independent fully automatic system for real time recognition of basic emotional expressions from video. The system automatically detects frontal faces in the video stream and codes them with respect to 7 dimensions: neutral, anger, disgust, fear, joy, sadness, surprise. The face finder is based on Viola Jones, (2001) with a more complex feature space and multiframe exclusion rules. The expression recognizer receives image patches located by the face detector. A Gabor energy representation of the patch is formed (Padget Cottrell, 1998; Bartlett et al., 2001) and processed by bank of 21 SVMs. The final coding into 7 expression categories is performed via multinomial ridge logistic regression. Results on the Cohn-Kanade dataset of posed facial expressions are discussed (Kanade, Cohn, and Tian, 2001). Strategies for performing multiclass decisions using SVM's are compared. The effectiveness of Gabor energy filters is examined. Different methods for combining information from the upper and lower regions of the face are also discussed. The generalization performance to novel subjects on 7-way forced choice based on 922 frames from 313 sequences was 90 percent correct. Most interestingly the outputs of the classifier change smoothly as a function of time, providing a potentially valuable representation to code facial expression dynamics in a fully automatic and unobtrusive manner.