Abstract

Emotion recognition using facial expression has become an active research topic in recent years. In this paper we present an efficient method for emotion recognition, which has better performance over previous art of works. This work proposes an efficient attempt to investigate the suitability and sensitivity of the thermal imaging technique to detect specific muscles heat patterns and there by predicting the emotions. In this work, feature extraction is carried out by
Kernel PCM and emotion classification is performed using Multi Class SVM. Thermal imaging is used for the investigation of Action Unit (AU) productions. A facial AU represents the contraction of a specific muscle or a combination of muscles, and earlier research had demonstrated that such muscle contraction induces an increase in skin temperature. For this reason, thermal imaging analysis might be well suited to detect AU production and thereby predicting the emotional state of a person. We used a multi class SVM approach to classify nine different AUs or combinations of AUs and to differentiate their speed and strength of contraction. The Multi class SVM classifier gives promising results for the emotion classification process.

References

- Irene Kotsiay, Stefanos Zafeiriouy, Nikolaos Nikolaidisy and Ioannis Pitasy, Multiclass Support Vector Machines and Metric Multidimensional Scaling for Facial Expression Recognition, Aristotle University of Thessaloniki, Department of Informatics Thessaloniki, Greece, 2009.
Emotion Analysis using Thermal Images based on Kernel Eigen Spaces

- Bai-Ling Zhang, Haihong Zhang, and Shuzhi Ge, "Face Recognition by Applying Wavelet Subband Representation and Kernel Associative Memory"; IEEE Transaction on Neural Networks.

Index Terms

Computer Science  Pattern Recognition

Keywords

Emotion Recognition  Action Unit  Thermal Imaging  Eigen Faces  Kernel Pca