UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY
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"Facial Expression Recognition Using Histogram Variances"

by

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Abstract

In human's expression recognition, the representation of expression features is essential for the recognition accuracy. In this work, we propose a novel approach for extracting dynamic expression features from facial expression videos. Our approach integrates dynamic expression features into a static image, called the Histogram Variances Face (HVF), by fusing histogram variances among the frames in a video. The HVFs can be obtained from videos with different frame rates and immune to illumination interference. In our experiments, for the videos picturing the same facial expression, e.g., surprise, happy or sadness, their corresponding HVFs are similar although the performers and frame rates are different. Therefore, the static facial recognition approaches can be utilized for the dynamic expression recognition. We take into account the human perspective and understanding of facial expressions. For the first time, we propose to use the Local Binary Pattern (LBP) defined on the hexagonal structure to extract local, dynamic facial features from facial expression images. We have applied this approach on the well-known Cohn-Kanade AU-Coded Facial Expression database and classified HVFs using PCA and Support Vector Machine (SVM). We have found that the accuracy of HVFs classification is very encouraging.

Biography

Professor Xiangjian He, as a Chief Investigator has received various national Research Grants awarded by Australian Research Council (ARC). He is a Professor of Computer Science in School of Computing and Communications and a Director of Computer Vision and Recognition Laboratory at the University of Technology, Sydney (UTS). He is an IEEE Senior Member. He has been awarded 'Internationally Registered Technology Specialist' by International Technology Institute (ITI). He has been carrying out research mainly in the areas of image processing, network security, pattern recognition and computer vision in the previous years. He is a leading researcher for image processing based on hexagonal structure. He has played a chairman role in various international conferences including IEEE CIT, IEEE AVSS and ICARCV. He is a guest editor for various international journals such as Journal of Computer Networks and Computer Applications (Elsevier), and in the editorial boards of various international journals. He is a supervisor of postdoctoral research fellows and PhD students. Since 1985, he has been an academic, a visiting professor, an adjunct professor, a postdoctoral researcher or a senior researcher in various universities/institutions including Xiamen University, China, University of New England, Australia, University of Georgia, USA, Electronic and Telecommunication Research Institute (ETRI) of Korea, University of Aizu, Japan, Hongkong Polytechnic University, and University of Macau.

ALL ARE WELCOME!