

学术报告通知

报告人: Professor YuHua GU, Chalmers University of Technology , Sweden

题目: Privacy-Preserving Fall Detection in Healthcare using Spatial-Temporal Shape and Appearance Features from Low-Resolution RGB-D Videos

时间: 2016年3月28日(周一)10:00-11:00

地点: 电院群楼 2-410 会议室

邀请人: 杨杰教授

Professor Irene GU 简历:

Irene Gu is a Professor in the Signal processing research group. Irene Gu's main research areas include: image analysis and computer vision, object classification and machine learning, and signal processing techniques for power engineering applications.

Her current main research activities include: visual object tracking with applications to video surveillance and vehicle/traffic safety; object activity analysis and recognition with applications to elderly care and office environments; signal processing with application to diagnosis of underlying causes of power system disturbances.

瑞典国家科技委员会成员。Session Chair (EO/IR III) in Detection and Remediation Technologies for Mines and Minelike Targets VI, SPIE AeroSense Conference, 16-20 April, 2001, Orlando, Florida, USA. Session Chair, in IEEE International Conf. on Multimedia and Expo (ICME 2006), 9-12 July, 2006, Toronto, Canada. Program Co-chair, EUDEM2-SCOT 2003 Conference (International Conference on Requirements and Technologies for the Detection, Removal and Neutralization of Landmines and UXO), 15-18 Sept. 2003, Brussels, Belgium. 10 多次国际学术会议的技术程序委员会成员。

报告摘要:

Qw address the issue on fall detection in healthcare using RGB-D videos. Privacy is often a major concern in video-based de-tetection and analysis methods. We propose a video-based fall detection scheme with privacy preserving awareness. First, a set of features is defined and extracted. This includes local shape and shape dynamic features from object contours in depth video frames, and global appearance and motion features from HOG and HOGOF in RGB video frames. A sequence of time-dependent features is then formed by a sliding window averaging of features along the temporal direction, and use this as the input of a SVM classifier for fall detection. Separate tests were conducted on a large dataset for examining the fall detection performance with privacy-preserving awareness. These include testing the fall detection scheme that solely uses depth videos, solely uses RGB videos in different resolution, as well as the influence of individual features and feature fusion to the detection performance. Our test results show that both the dynamic shape features from depth videos and motion (HOGOF) features from low-resolution RGB videos may preserve the privacy meanwhile yield good performance (91.88% and 97.5% detection, with false alarm (\leq 1.25%). Further, our results show that the proposed scheme is able to discriminate highly confused classes of activities (falling versus lying down) with excellent performance. Our study indicates that methods based on depth or low-resolution RGB videos may still provide effective technologies for the healthcare, without impact personnel privacy.