

Machine Learning and Deep Learning Approach for People Recognition and Tracking in Crowd for Safety Monitoring

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Abstract : Deep learning application in computer vision is rapidly advancing, giving it the ability to monitor the public and quickly identify potentially anomalous behaviour from crowd scenes. Therefore, the purpose of the current work is to improve the performance of safety of people in crowd events from panic behaviour through introducing the innovative idea of Aggregation of Ensembles (AOE), which makes use of the pre-trained ConvNets and a pool of classifiers to find anomalies in video data with packed scenes. According to the theory of algorithms that applied K-means, KNN, CNN, SVD, and Faster-CNN, YOLOv5 architectures learn different levels of semantic representation from crowd videos; the proposed approach leverages an ensemble of various fine-tuned convolutional neural networks (CNN), allowing for the extraction of enriched feature sets. In addition to the above algorithms, a long short-term memory neural network to forecast future feature values and a handmade feature that takes into consideration the peculiarities of the crowd to understand human behavior. On well-known datasets of panic situations, experiments are run to assess the effectiveness and precision of the suggested method. Results reveal that, compared to state-of-the-art methodologies, the system produces better and more promising results in terms of accuracy and processing speed.

Keywords : action recognition, computer vision, crowd detecting and tracking, deep learning

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