

An Improved Action Key Frames Extraction Algorithm for Complex Colour Video Shot Summarization

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Key frame extraction is one of the critical techniques in computer vision fields such as video search, video identification and video forgeries detection. The extracted key frames should be sufficient key frames that preserve main actions in a video with compact representation. The objective of this work is to improve our previous action key frames extraction algorithm (AKF) by adapting a threshold which selects action key frames as final key frames. The threshold adaptation was achieved by using the mean value, the standard deviation, and the L1-norm instead of the comparison of user summaries evaluation method to obtain a fully automatic video summarisation algorithm, and by eliminating the conditions in selecting the final key frames to reduce the complexity of the algorithm. We have validated our proposed Improved AKF on complex colour video shots instead of the simple grey level video shots. The Improved AKF algorithm was able to extract a compact number of action key frames by preventing redundant key frames, reduce processing complexity, and preserve sufficient information about the main actions in a video shot. We then evaluated the Improved AKF algorithm with the-state-of-the-art algorithms in terms of compression ratio using Paul videos and Shih-Tang dataset. The evaluation results showed that the Improved AKF algorithm achieved better compression ratio and retained sufficient information in the extracted action key frames under different testing video shots. Therefore, the improved AKF algorithm is a suitable technique for applications in computer vision fields such as passive object-based video authentication systems.

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