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EURASIP Journal on Image and Video Processing 2012, **2012**:23 doi:10.1186/1687-5281-2012-23

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ISSN 1687-5281

Article type Research

Submission date 4 May 2012

Acceptance date 20 November 2012

Publication date 19 December 2012

Article URL <http://jivp.urasipjournals.com/content/2012/1/23>

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Content-based obscene video recognition by combining 3D spatiotemporal and motion-based features

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Abstract

In this article, a new method for the recognition of obscene video contents is presented. In the proposed algorithm, different episodes of a video file starting by key frames are classified independently by using the proposed features. We present three novel sets of features for the classification of video episodes, including (1) features based on the information of single video frames, (2) features based on 3D spatiotemporal volume (STV), and (3) features based on motion and periodicity characteristics. Furthermore, we propose the connected components' relation tree to find the spatiotemporal relationship between the connected components in consecutive frames for suitable features extraction. To divide an input video into video episodes, a new key frame extraction algorithm is utilized, which combines color histogram of the frames with the entropy of motion vectors. We compare the results of the proposed algorithm with those of other methods. The results reveal that the proposed algorithm increases the recognition rate by more than 9.34% in comparison with existing methods.

Keywords

Obscene video recognition, Content-based video retrieval, 3D spatiotemporal features, Key frame extraction