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Video Shot Detection

General

Shot detection is a process that is typically applied in early stages of a video analysis chain. It is needed for further analysis and useful for certain visualizations and segmentation of video content. Shots can be considered the *building blocks* of video, and the shot detection module provides the means to recover these building blocks from edited video.

Shot boundaries

There are several types of transitions in videos, or boundaries between shots, that can broadly be categorized into two classes: *hard cuts* and *gradual transitions*. Hard cuts are the most prominent type. Video shots of action movies of the last decade are bounded in nearly 99% by hard cuts. The Shot Detection focuses on the detection of those hard cuts, but addresses to some extent also gradual transitions.

Key frame extraction

Extracting a single *key* frame for each shot can give users a quick visual overview of a video. Shot detection is a crucial step towards the extraction of such key frames.

Real-time performance

The Shot Detection uses efficient features and metrics to detect shot boundaries and is thus able to perform several times faster than standard video real-time.

Content-adaptive processing

The final decision where the detected shot boundaries are finally located in an inspected video is usually deferred to the end of the entire video analysis. This enables the Video Shot Detection to adapt to the content of the video and derives its decisions on every available bit of information.

Reduction of outliers

In a post-processing step heuristics on the minimum expected length of shots are applied to reduce false positives in the detection results and to specify boundaries at gradual transitions.

Flash light detection

A special type of outliers results from flashlights commonly seen in news and sports video footage. The Shot Detection employs a special flash light detector to eliminate false positives caused by photographers. This feature does not affect the special *flash* transition effect used in some modern movies.

A flashlight occurring during a shot can irritate simple shot detection methods

Integration into existing systems

Results of the shot detection module can be exported in MPEG-7 format and thus be easily integrated into existing video analysis, annotation and retrieval systems of any kind of digital media asset workflow containing video information.