

Abstract

Wireless mobile systems of the 3rd generation have limited bandwidth. To support multimedia streaming over such systems requires high compression, which can result in a considerable visual distortion of the video quality. Especially challenging content to be transmitted over mobile networks are the sport videos, most popular of which is the soccer. Soccer match sequences usually contain various scene changes like for example scene cuts, zooming, transitions, wipes, fast motion scenes as well as wide angle panning parts. Task of this project is to enable preprocessing of such soccer videos to make it more robust against the compression impairments. The most important object in a soccer match is the ball. Due to the compression impairments (blurriness), it may happen that in the wide-angle camera shots, where the ball is very small, it disappears, or appears very unclearly. This is annoying for the user. To overcome this, the position of a ball can be found in each frame and it can be replaced by a slightly bigger ball or just sharpened, depending on the required compression ratio. To perform the preprocessing reliably, a robust video segmentation is crucial. Spatial and temporal video segmentation allows recognizing of the critical scenes that need to be preprocessed. Focus of this work is the playfield segmentation according to the straight lines as well as the detection of various scene changes, especially scene cuts, zooming and pans. Investigated methods are of low complexity to enable real-time preprocessing. If possible, algorithms deployed at the video encoder are used to ease the possible implementation into the encoder. In combination with the known position of the ball, the segmentation provides means for the event detection in soccer game.