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ABSTRACT

Background subtraction has been widely discussed in video surveillance, but it still has open challenges such as dynamic background, illumination variation. To address these challenges a novel Cut set-based Dynamic Key frame selection (CDK) and Adaptive Layer-based Background Modeling (ALBM) approach for background subtraction is proposed which adaptively changes layers in the background model for each scenario such as static, dynamic background and high illumination.
The concept of key frame is used to choose representative frames from the video. In order to capture the invariant directional codes of each spatio-temporal patch symmetric operators such as line and rotational symmetry are used. The proposed method identifies highly similar static spatio-temporal patches and sets it as background there by reducing the computational complexity in the foreground detection step. Both qualitative and quantitative evaluations on challenging video sequences demonstrate that the proposed algorithm performs background subtraction more favorably than the state-of-the-art methods.

Index Terms— Cut set-based Dynamic Key frame selection, Adaptive Layer-based Background Modeling, Background Subtraction, Object Tracking