

# Moving Object Segmentation and Classification of HEVC Compressed Video

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**ABSTRACT :** Intelligent video surveillance is done through moving object segmentation and classification of HEVC compression. Compared with H.264/AVC, HEVC introduces a host of new coding features which can be further exploited for moving object segmentation and classification. In the proposed method, firstly, motion vector interpolation for intra-coded prediction unit and pre-processing is done for removing unwanted noise in video. Secondly, blocks with non-zero motion vectors are clustered into the connected foreground regions using the four connectivity component labelling algorithm. Thirdly, object region tracking based on temporal consistency is applied to the connected foreground regions to remove the noise regions. Coding unit size and prediction unit size further refines the boundary of moving object. Finally, a person or vehicle is identified and classified using HEVC syntax. The experimental results demonstrate that the proposed method provides the solid performance and can classify moving persons and vehicles accurately.

**KEYWORDS:** Compression domain, Object Segmentation, Object Classification, HEVC, Video Surveillance

## I. INTRODUCTION

Moving object segmentation and classification from video data is one of the most important tasks for intelligent video surveillance. Most computer vision methods for moving object detection and classification assume that the original video frames are available and extract descriptions or features from pixel domain. Note that most video content are received or stored in compressed formats encoded with international video coding standards, such as MPEG-2, H.264/AVC and HEVC. To obtain the original video frame, we have to perform video decoding. In video analysis at large scales, such as content analysis and search for a large surveillance network, the complexity of video decoding becomes a major bottleneck of the real-time system. To address this issue, compression-domain approaches have been explored for video content analysis which extracts features directly from the bit stream syntax, such as motion vectors and block coding modes. The major advantage of compression-domain approaches is their low computational complexity since the full-scale decoding and reconstruction of pixels are avoided. Then, compressed the real time video analysis applications. In this paper, we focus on moving object segmentation and classification from HEVC compressed surveillance videos. Then video is bitstream, identify its person or vehicle.

## II. LITERATURE SURVEY

It infers that using standard video sequences and show that hybrid framework provides better tracking accuracy than a state-of-the-art MRF model. This paper infers that using H.264 compressed video classification using Histogram of Oriented Motion Vectors (HOMV). The Space-Time cubes select dare partially overlapped. HOMV is found to be very effective to define the motion characteristics of these cubes. We use Bag of Features (BOF) approach to define the video as histogram, obtained using k-means clustering. Then, its found to be very effective.

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## III. EXISTING SYSTEM

The existing MV's (Moving Vectors) from the compressed bit stream are determined in terms of rate-distortion and they may not represent the true object motion. Therefore, it is difficult to find real moving objects solely based on the MV fields. To address this issue, other information, such as DCT (discrete cosine transforms) coefficients and macro-block partitions, are used to detect and track moving objects. The number of bits consumed by each 4×4 block to detect the moving objects from H.264/AVC videos. It presents a segmentation method that takes advantage of the inter frame motion and intra-frame DCT coefficients embedded in MPEG videos. Disadvantage of this system is reduced battery life.

## IV. PROPOSED SYSTEM

Motion Vector interpolation for intra-coded prediction unit and preprocessing is done for removing unwanted noise in the video. Blocks with non-zero motion vectors are segmented into the foreground regions using the four-connectivity component labeling algorithm. Object region tracking based on temporal consistency is applied to the connected foreground regions to remove the noise regions. The boundary of moving object region is further refined by the coding unit size and prediction unit size. A person-vehicle classification model using HEVC syntax words is trained to identify and classify the moving objects, either persons or vehicles.

### Advantages

The computational complexity is so low, many in the Video Coding field have used the technique to estimate a motion vector at each pixel.

The approach is of limited use because some finite support region must always be employed to set up the necessary equations.

## V. METHODOLOGY

The overall framework of our system is consisting of two stages: moving object segmentation and person-vehicle classification. For moving object segmentation, firstly, MV interpolation for intra-coded prediction unit (PU) and MV outlier removal are employed for pre-processing. Then, blocks with non-zero motion vectors are clustered into the connected foreground regions by using the four-connectivity component labelling algorithm. Finally, object region tracking with temporal consistency is applied to the connected foreground regions to remove the noise regions. The boundary of moving object region is further refined by using the coding unit (CU) and PU sizes of the blocks. For person-vehicle classification, it involves a training phase to learn the person-vehicle model using "bag of spatiotemporal HEVC syntax words" and a testing phase to apply the learned model to test videos. For the testing phase, we first extract the spatial and temporal information of each 4×4 block to obtain the feature descriptor. Then, the descriptors of all blocks are clustered into a number of code word. The foreground object is represented by a histogram of the code word. Finally, for the segmented moving object, we apply the learned person-vehicle model to determine which category to assign.

## 1.1 Modules

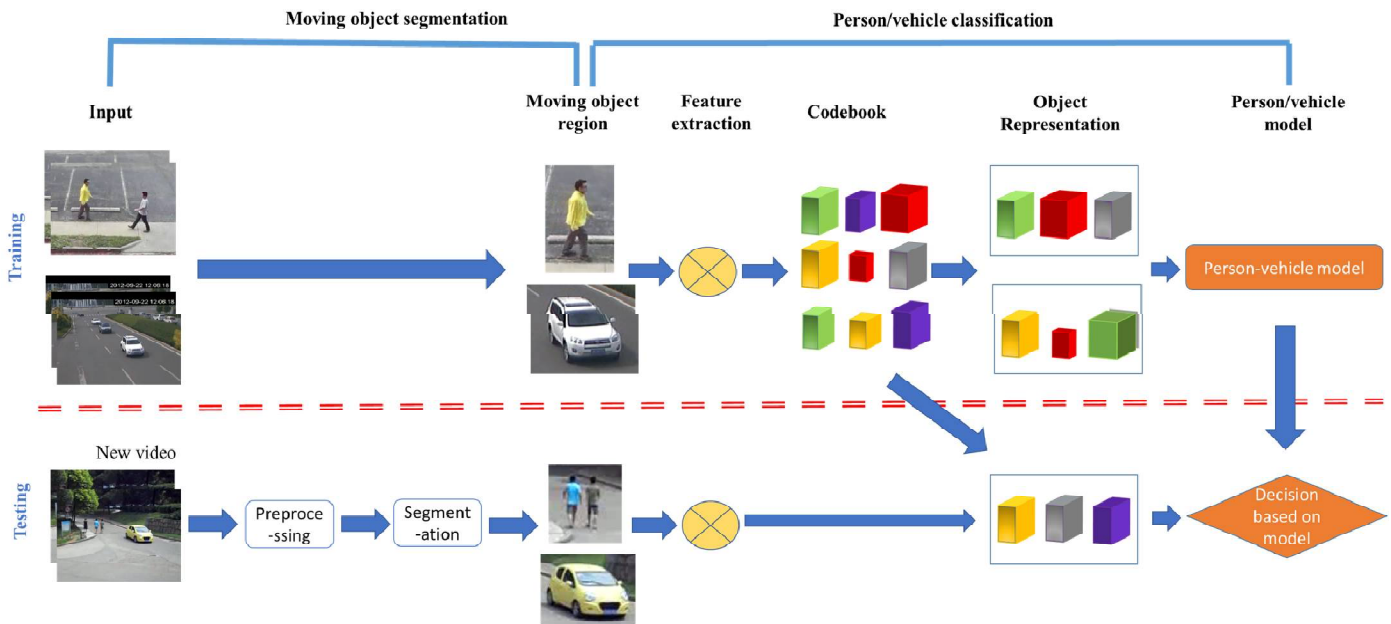


Figure No. 2 Modules of HEVC compressed video

## 1.2 Flowchart

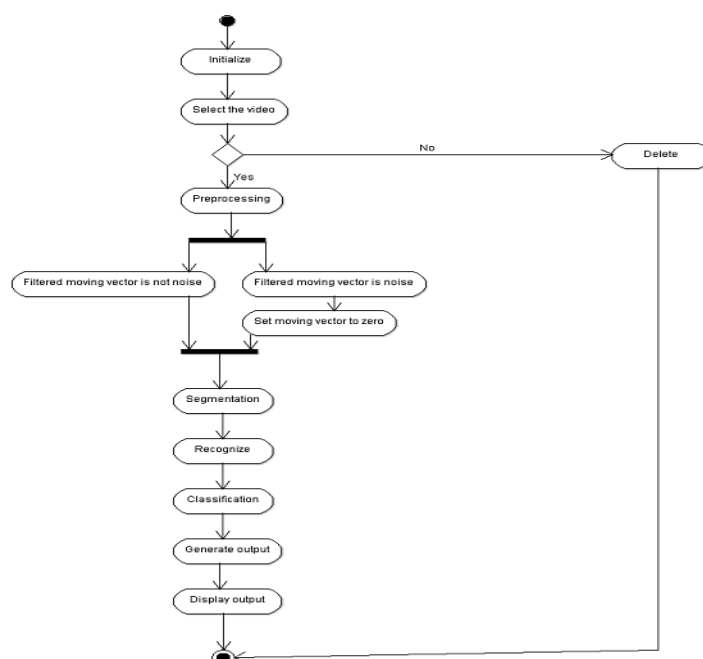


Figure No. 3 Flowchart of Moving Object Segmentation and Classification in HEVC Compressed Video

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Start and initialize the video and select it, the coding done the part of preprocessing to be filtered and the two sub phases of moving vector, one is moving vector has a noise the other is without noise, if it is with noise the moving vector set to zero and parallel processing of the vector. Segmented the videos during the processing and HEVC use compressed the video and generate the output for the moving object classification.

## VI. CONCLUSION

A system for Object Segmentation and Classification in HEVC compressed video is highly useful for security application and high accuracy. In more applications gives their importance for using videos and apply it. In future, JVET is using more accuracy than this system.

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## REFERENCES

1. Siddappa Pulare , Dr.T.S Indumathi, "Advanced Real Time Objects Detection and Tracking in HEVC Videos" , IJIRST-International Journal for Innovative Research in Science & Technology. Vol 3, Issue 09, February 2017.
2. Serhan Gul, Jan Timo Meyer, Thomas Schierl, Cornelius Hellge and Wojciech Samek, "Hybrid Video Object Tracking In H.265/HEVC Video Streams" , IEEE paper on September 2016.
3. Sovan Biswas, R.Venkatesh Babu, "Motion Detection and Segmentation in H.264 compressed Domain For Video Surveillance Application" , International Journal of Research in Advent Technology, Vol.3, No.8, August 2015 E-ISSN: 2321-9637.
4. C. Solana-Cipres, L. Rodriguez-Benitez1,J. Moreno-Garcia, L. Jimenez, G. Fernandez-Escribano," Real-time segmentation of moving objects in H.264 compressed domain with dynamic design of fuzzy sets", in 1.Escuela Superior de Informatica, Universidad de Castilla-La Mancha Ciudad Real, Spain ,ISBN: 978-989-95079-6-8.,2009
5. Marina Georgia Arvanitidou , Michael Tok, Alexander Glantz, Andreas Krutz,ThomasSikora,"Motion-based object segmentation using hysteresis and bidirectional inter-frame change detection in sequences with moving camera" inSignal Processing: Image Communication 28 (2013).
6. StéphanePécharde, Dominique Barba, Patrick Le Callet, "VIDEO QUALITY MODEL BASED ON A SPATIO-TEMPORAL FEATURES EXTRACTIONFOR H.264-CODED HDTV SEQUENCES" at Université de Nantes – IRCCyN laboratory – IVC team Polytech'Nantes, rue Christian Pauc, 44306 Nantes, France.