ISSN No. 0976-5697

Volume 7, No. 2, March-April 2016

International Journal of Advanced Research in Computer Science

RESEARCH PAPER

Available Online at www.ijarcs.info

Survey on Video Compression Techniques Based on Redundancy and its Applications

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Abstract: Video compression had been one of the pioneering areas of research. This paper discusses the characteristic of video coding from the scratch of key frame selection to the evolutions of various standards. In order to precisely deal with applications an automatic surveillance system and its characteristics of monitoring had been mentioned. Thus an entire platform for compressed video with fidelity measure, shot reconstruction degree which provides pivotal characteristics for any compressed video had been stated. Thus several open issues had been discussed to elaborate the characteristics of future research in this arena.

Keywords: Video, Coding, Segmentation, Character,Image

I .INTRODUCTION

The rich feature of image and video and its conceptual importance in various domains makes compression which reduces the computational cost. This has been surveyed in context of segmentation of moving object, human recognition, indexing, retrieval, face detection, video classification and object tracking in compressed videos [1].The paper focuses upon video retrieval strategies.
The chapter 2 discusses the related work, chapter 3 discusses video compression standards, chapter 4 The entire summary had been provided as an conclusion chapter 5 Future scopes discussed finally.

II . RELATED WORKS

Statistical character was analyzed with compressed video data. The inference shows that high randomness in data at the byte level due to the use of variable-length Huffman codes and other processes involved in video compression [2]. The resources constraints of video sensing systems was due to bandwidth of video data fluctuates dramatically [3] was analysed in two manner joint compression and encryption algorithm and the other as compression independent encryption algorithm [3].

Static video

The intra-shot and inter-shot redundancy removal for static video summarization was presented where the first step was to analyse the key frame extraction [4].
In a video context when the same scene is covered by different cameras a duplication occurs [5]. This can be classified as discussed by authors in [4] as intra-shot (within a single shot) and inter-shot (within several shot) redundancy.
So investigation of proper key frame is a main task this was discussed in [6] where a score value was taken

$$\text{score}=\frac{\text{sum of key frames}}{\text{Number of keyframes}} \quad (1)$$

The other issue that has to be further investigated is the coverage of a set of key-frames extracted from the original video [7]. This can be defined as number of frames which are represented by the key-frame set.

This can be defined as in [8]

$$\text{Coverage} = \frac{\text{Represented number of frames}}{\text{Total number of frames}}$$

the number of frames which are represented by the key-frame set.
In the case of Automatic summarization of surveillance videos (ASOSV) the classification may be AS IN [9]

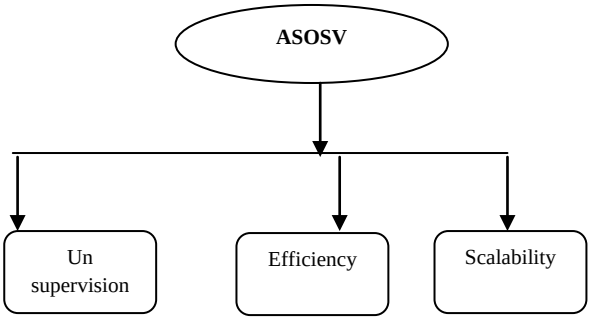

Figure 1 Shows the taxonomy as discussed by authors in [9].
Three quality measures as in [10] that has to be considered are
Fidelity measure,
"It compares each key frame in the summary with other frames in the video sequence, defined by semi-Hausdorff distance".
The Shot Reconstruction Degree measure
"Is a suitable frame interpolation algorithm, we should be able to reconstruct the whole sequence, from the set of key frames".
The Compression Ratio measure

The compression rate can be termed as 1 – percentage of key frames or coverage.

A key-frame extraction method was discussed in [11] that has the potential of combining several image descriptors and predicting the importance of each descriptor of a video sequence.

III. VIDEO COMPRESSION STANDARDS

The recent standards of video coding had been stated below as in [13]

The first compression standard was MPEG-2

Moving Picture Experts Group (MPEG)-2 video coding standard (ITU-T Rec. H.262 and ISO/IEC 13818-2 [14]

The second compression standard (AVC) used in 2000

Advanced Video Coding (AVC) video compression standard (ITU-T H.264 and ISO/IEC 14496-10) [15]

The latest compression standard used in 2010

High Efficiency Video Coding (HEVC) standard (ITU-T H.265 and ISO/IEC 23008-2) [16]

IV .CONCLUSIONS

Thus a coarse architecture had been provided with video compression where a key frame selection score, coverage and compression where discussed. Then in order to bring in the application context a automatic surveillance system was taken and the metrics of un supervision (without any training), efficiency (timeliness) and scalability (with hierarchical analysis had been developed [10].

V. FUTURE SCOPE

The importance of security will be used in the next issue where encrypt DCT (Discrete Cosine Transform) coefficients, MV(Motion Vector) and other parameters in video encoding will be discussed.

In addition it will dissolve the issues of rate–distortion (R–D) optimized error-resilient scheme and channel losses [12].

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