ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijircce.com

Vol. 5, Issue 3, March 2017

An Optimal Video Compression Using Block Separation with Absolute Moment Block Truncation Coding (AMBTC)

K.Punniya[1], K. S.Gunasundari M.Sc.,M.Ed., M.Phil[2]

M.Phil Scholar, Dept. of Computer Science., Sakthi College of Arts and Science For Women, Dindigul, India.

Head of Department, Dept. of Computer Science., Sakthi College of Arts and Science For Women, Dindigul, India.

ABSTRACT: Video Compression is a fundamental issue in Video mining, specifically it has been used to detect and remove anomalous objects from data. Video data's arise due to mechanical faults, changes in system behavior, fraudulent behavior, network intrusions or human error. In this paper presents an optimal Video Compression using Block separation with Absolute Moment block truncation coding (AMBTC) incorporates compression concept, which is the process of deriving the information from the unsupervised video database. An efficient compression detection and frame capabilities in the presence of ratio is based on filtering the data after compression process. Using the new AMBTC selection method between spatial and temporal prediction we show that our scheme is better than the state-of-the-art lossless compression algorithms.

KEYWORDS: Compression; Video; Block Truncation Coding; DCT;

I. INTRODUCTION

Automated video analysis is important for many vision applications, such as surveillance, traffic monitoring, augmented reality, vehicle navigation, etc. [1], [2]. As pointed out in [1], there are three key steps for automated video analysis: object detection, object tracking, and behaviour recognition. As the first step, object detection aims to locate and segment interesting objects in a video. Then, such objects can be tracked from frame to frame, and the tracks can be analysed to recognize object behaviour. Thus, object detection plays a critical role in practical applications.

Compression is a reversible conversion (encoding) of data that contains fewer bits. This allows a more efficient storage and transmission of the data. The inverse process is called decompression (decoding).Software and hardware that can encode and decode are called decoders. Both combined form a codec and should not be confused with the terms data container or compression algorithms.

In the lossless compression, the image after decompression is identical to that of the original. The issue in lossless coding is how much we can reduce the data rate. The main approach for lossless image compression is predictive coding or entropy encoding. For predictive coding, DPCM (Differential Pulse Code Modulation) [3] is often used. Linear predictors are used where the prediction is obtained by the linear combination of previously decoded neighbors. For entropy coding, Run-length coding [4], Huffman coding [5], or arithmetic coding is used. Context modeling can be included in the entropy encoding, which is to estimate the probability distribution function of the symbols conditioned on the context, so as to increase the compression performance. The context consists of a combination of neighboring pixels already encountered.

II. RELATED WORK

In [2] authors proposed a spatial domain model of the quantization error based on a statistical noise model of the error introduced when quantizing the DCT coefficients. The resulting theoretically derived spatial domain quantization noise model shows that, in general, the compression noise in the spatial domain is both correlated and spatially varying. This provides some justification for many of the ad hoc artifact removal filters that have been proposed. In [3] authors described the employ an energy-based approach to measure this motion-compensated edge artifact, using both compressed bit stream information and decoded pixels. We evaluate the performance of our proposed metric, along with several blocking and blurring metrics, on compressed video in two ways. First, ordinal scales are evaluated

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering
(An ISO 3297: 2007 Certified Organization)
Website: www.ijircce.com
Vol. 5, Issue 3, March 2017

through a series of expectations that a good quality metric should satisfy: the objective evaluation. In [4] authors presented a multi-scale image features are combined into a single topographical saliency map. A dynamical neural network then selects attended locations in order of decreasing saliency. The system breaks down the complex problem of scene understanding by rapidly selecting, in a computationally efficient manner, conspicuous locations to be analyzed in detail. In [5] Authors discussed to evaluate the applicability of a biologically-motivated algorithm to select visually-salient regions of interest in video streams for multiply-foveated video compression. Regions are selected based on a nonlinear integration of low-level visual cues, mimicking processing in primate occipital, and posterior parietal cortex. A dynamic foveation filter then blurs every frame, increasingly with distance from salient locations. Sixty-three variants of the algorithm (varying number and shape of virtual foveas, maximum blur, and saliency competition) are evaluated against an outdoor video scene, using MPEG-1 and constant-quality MPEG-4 (DivX) encoding. In [6] authors reviewed the physiological characteristics of human perception and address the most relevant aspects to video coding applications. Moreover, we discuss the computational models and metrics which guide the design and implementation of the video coding system, as well as the recent advances in perceptual video coding. To introduce this overview with the latest technologies and most promising directions in perceptual video coding, we focus on three key areas.

III. PROPOSED ALGORITHM

The proposed method accepts the video Compression using Absolute Moment block truncation coding (AMBTC) parameters as input which contains the MATLAB simulation where the based video compression algorithm is applied to the real-world image databases. This overall proposed architecture in figure1 follows a Compression framework from the beginning to end state.

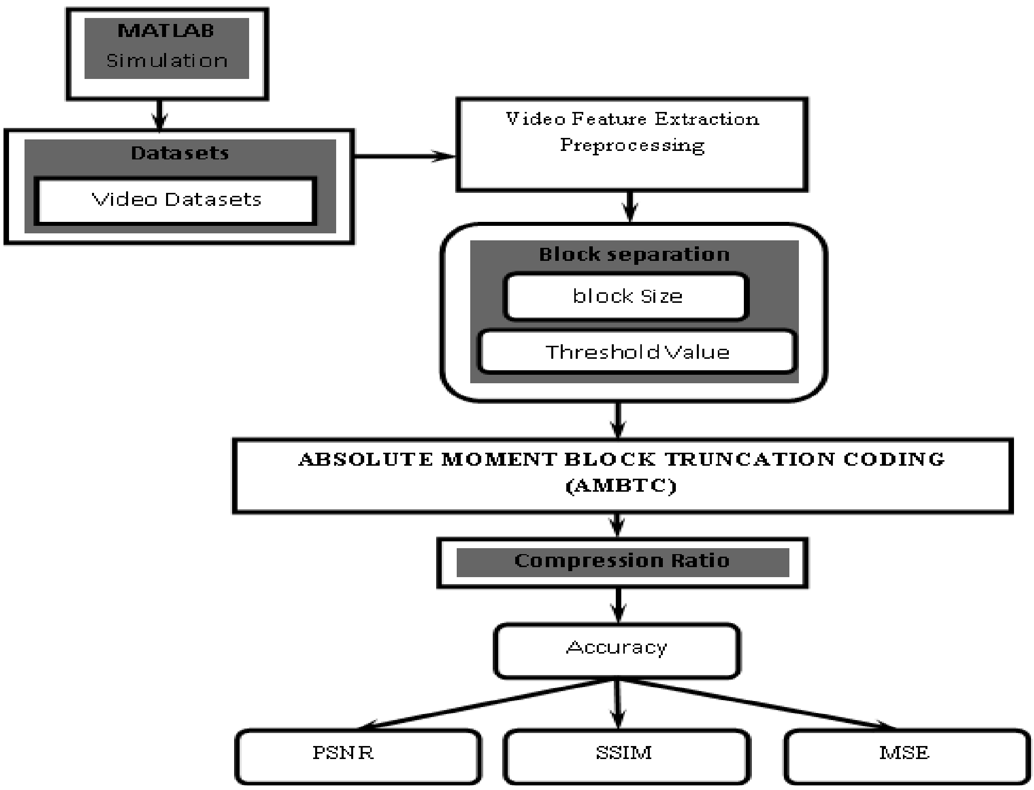

Fig.1. Proposed Framework flow diagram

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering
(An ISO 3297: 2007 Certified Organization)
Website: www.ijircce.com
Vol. 5, Issue 3, March 2017

A. *VIDEO FEATURE EXTRACTION*

Video summarization is a compact representation of a video sequence. It is useful for various video applications such as video browsing and retrieval systems. A video summarization can be a preview sequence which can be a collection of key frames which is a set of chosen frames of a video. Key-frame-based video summarization may lose the spatio-temporal properties and audio content in the original video sequence; it is the simplest and the most common method. When temporal order is maintained in selecting the key frames, users can locate specific video segments of interest by choosing a particular key frame using a browsing tool. Key frames are also effective in representing visual content of a video sequence for retrieval purposes. Video indexes may be constructed based on visual features of key frames, and queries may be directed at key frames using image retrieval techniques. Video frames reduce the amount of data required in video indexing and provides framework for dealing with the video content

In Video Frame extraction method involves converting .avi video file in to number of frames. In frame extraction there are two types methods to be implemented, .JPG file formatCdata (Character Data) conversion Processing each frame by taking the histogram difference between them and the frames above the some average will be collected.

B. *BACKGROUND BLOCK SEPARATION*

The background block separation is to subtract the image from a reference image that models the background scene. Typically, the basic steps of the algorithm are as follows:

- Background modeling constructs a reference image representing the background.
- Threshold selection determines appropriate threshold values used in the subtraction operation to obtain a desired detection rate.
- Subtraction operation or pixel classification classifies the type of a given pixel, i.e., the pixel is the part of background (including ordinary background and shaded background), or it is a moving object.

Background subtraction is particularly a commonly used technique for motion segmentation in static scenes. It attempts to detect moving regions by subtracting the current image pixel-by-pixel from a reference background image that is created by averaging images over time in an initialization period. The pixels where the difference is above a threshold are classified as foreground. After creating a foreground pixel map, some morphological post processing operations such as erosion, dilation and closing are performed to reduce the effects of noise and enhance the detected regions. The reference background is updated with new images over time to adapt to dynamic scene changes.

C. *ABSOLUTE MOMENT BLOCK TRUNCATION CODING (AMBTC)*

In this technique video compression is done using absolute moment block truncation coding. It is an improved version of BTC, preserves absolute moments rather than standard moments, here also a digitized image is divided into blocks of n x n pixels. Each block is quantized in such a way that each resulting block has the same sample mean and the same sample first absolute central moment of each original block. AMBTC has been extensively used in signal compression because of its simple computation and better mean squared error (MSE) performance. It has the advantages of preserving single pixel and edges having low computational complexity. The original algorithm preserves the block mean and the block standard deviation. Other choices of the moments result either in less MSE or less computational complexity. In AMBTC algorithm similar to BTC there are four separate steps while coding a single block of size n x n. They are quad tree segmentation, bit plane omission, bit plane coding using 32 visual patterns and interpolative bit plane coding.

- In this method compressed the video frame using AMBTC algorithm.
- Original imageis segmented into blocks of size 4x4 or 8x8 for processing.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijircce.com

Vol. 5, Issue 3, March 2017

- Find the mean of each block also the mean of the higher range and lower range.
- Based on these means calculated for each block, bitplane is calculated
- Image block is reconstructed by replacing the 1"s with higher mean and 0"s with lower mean.

At the encoder side an video frame is divided into non-overlapping blocks. The size of each non overlapping block may be (4 x 4) or (8 x 8), etc. Calculate the average gray level of the block (4x4) as (for easy understanding we made the compression for 4 x 4 block. The same procedure is followed for block of any size):

$$\bar{X} = \frac{1}{16}\sum_{i=1}^{16} X_i \qquad eq. (1)$$

Where X_i represents the i^{th} pixel in the block. Pixels in the image block are then classified into two ranges of values. The upper range is those gray levels which are greater than the block average gray level (X) and the remaining brought into the lower range.

IV. CONCLUSION AND FUTURE WORK

In this paper presents a novel Video Compression using Absolute Moment block truncation coding (AMBTC) in Mapping Framework which combines videos and Real-world data's. The Video Compression detection using AMBTC logic with block combination for grouping approach has not previously been attempted. The proposed AMBTC combination method had proven to be more robust than the Spatial and temporal frame maps baseline on real-world data, as well as in the presence of high levels of artificially introduced noise. This initial evaluation suggests that using anomaly both as detection prototypes and points guiding the centroid-based search is a promising new idea in high-dimensional and noisy data. In future the Medical image compression system could be an extra option for processing in Latent images.

REFERENCES

1. M. A. Robertson and R. L. Stevenson, "DCT quantization noise in compressed images," IEEE Trans. Circuits Syst. Video Technol., vol. 15, no. 1, pp. 27–38, Jan. 2005.
2. A. Leontaris, P. C. Cosman, and A. R. Reibman, "Quality evaluation of motion-compensated edge artifacts in compressed video," IEEE Trans. Image Process., vol. 16, no. 11, pp. 943–956, Apr. 2007.
3. L. Itti, C. Koch, and E. Niebur, "A model of saliency-based visual attention for rapid scene analysis," IEEE Trans. Pattern Anal. Mach. Intell., vol. 20, no. 11, pp. 1254–1259, Nov. 1998.
4. L. Itti, "Automatic foveation for video compression using a neurobiological model of visual attention," IEEE Trans. Image Process., vol. 13, no. 10, pp. 1304–1318, Oct. 2004.
5. Z. Chen, N. K. Ngan, and W. Lin, "Perceptual video coding: Challenges and approaches," in Proc. IEEE ICME, Jul. 2010, pp. 784–789.
6. Z. Li, S. Qin, and L. Itti, "Visual attention guided bit allocation in video compression," Image and Vision Computing, vol. 29, no. 1, pp. 1–14, 2011.