ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 20, April 2016

VIDEO COMPRESSION USING HEVC STANDARD TOOL

R.Ranjana[1], Dr.K.Mahesh[2]

Research Scholar[1], Professor[2]
Department of Computer Science & Engineering
Alagappa University, Karaikudi-630002
ranjana.bscit@gmail.com[1]
mahesh.alagappa@gmail.com[2]

***Abstract*— Video compression is an emerging research topic in technology field. This paper proposes a new HEVC standard tool technique in compressing video as well as provide the subsequent techniques like joint prediction techniques along with skip, motion compensation, adaptive prediction, inter or intra modes, are also presented. Finally, frames are binded together to provide efficient video quality as well as compression is high. Evaluation of H.265, H.264 and, Motion JPEG using different video coding techniques are used for high compression efficiency, it is essential to maintain the computational complexity in video codec. HEVC standard tool provides the high compression efficiency and video quality is improved.**

***Keywords*— HEVC, JCT-VC, MPEG-H, VCEG, H.265/AVC, Video compression, Standards Development.**

I. INTRODUCTION

A video compressing standardization has been developed by Joint Collaborative Team on Video Coding (JCT-VC), jointly by ITU-T Video Coding Experts Group (VCEG) and ISO/IEC Moving Pictures Expert Group (MPEG).This standard is known as High Efficiency Video Coding (HEVC) or H.265. HEVC is also known as ISO/IEC 23008-2 MPEG-H Part 2 and ITU-T H.265.HEVC has achieved enormous compression performance improvement. H.265, High Efficiency Video Coding (HEVC) is the latest generation video compression standard. Video coding standards have evolved primarily through the development of the well-known ITU-T and ISO/IEC standards. Throughout this evolution, continued efforts have been made to maximize compression capability and improve other characteristics such as highest possible quality at any given bit rate and more flexible partitioning, from large to small partition sizes. HEVC is a video coding format for storage or transmission of digital video content. HEVC can support 8K Ultra High Definition video, with a picture size up to 8192×4320 pixels.

The joint spatio-temporal (space and time) concern is established experimentally to often result in improved video quality and in huge amount instances to offer higher compression rates and righteous computational speed. The High Efficiency Video Coding standard (HEVC) adopts the skip mode to improve the coding efficiency of compound video. The skip mode's values of pixels in blocks are facsimiled from pixels in the same position in reference frame directly. The Motion Compensation mode pixels in blocks are predicted as X' in the reference frame. It is the same with the inter mode in traditional coding. Joint prediction mode manipulate the pixels in blocks is predicted as joint predict error and covers the most of the images in video sequence. The adaptive motion vector prediction is a new method to improve inter-prediction (compression technology).

II. RELATED WORK

[1] K.Muller, H.Schwatrz, "**3D High-Efficiency Video Coding for Multi-View Video and Depth Data**", IEEE Transactions on Image Processing, 2013.

Muller and **Schwartz** examined the modified motion compensation and motion vector coding as well as the concept of motion parameter inheritance are part of the HEVC extension. These extensions are used to 3D High-Efficiency video for Multi-view video and Depth data.

[2] J.R.Ohm,Thiow Keng Tan ,T. Wiegand "**Comparison of the Coding Efficiency of Video Coding Standards—Including High Efficiency Video Coding (HEVC)**", IEEE Transactions on Circuits and Systems for Video Technology, 2012.

J.R.Ohm, Thiow Keng Tan ,T. Wiegand suggest that " a combined approach is applied to the analysis of designs, including H.262/MPEG-2 Video, H.263, MPEG-4 Visual, H.264/MPEG-4 Advanced Video Coding (AVC), and High Efficiency Video Coding (HEVC)".The results of subjective tests indicate that HEVC encoders can achieve equivalent subjective reproduction quality as encoders that conform to H.264/MPEG-4 AVC when using approximately 50% less bit rate on average. The HEVC design is revealed to be particularly valuable for low bit rates, high-resolution video content, and communication application is low-delay.

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 20, April 2016

[3] J.Wang, "**An efficient coding scheme for surveillance videos based on high efficiency video coding**", Natural Computation (ICNC), 2014.

J.Wang surveyed the development in compression efficiency has been achieved at the cost of large increase in computational complexity. They propose a new coding scheme for surveillance videos using inter-frame difference to different encoder options with encode different image areas.

III. EXISTING WORK

The video manipulation process can be made with the limited length. The processing in existing system the frame rates cannot be modified and the frame rate is limited to the modification. Moreover the processing is a complex while processing the video.

IV. PROPOSED WORK

The key objective of this paper is to assess the performance of the proposed new video coding standard; the High Efficiency Video Coding (HEVC) standard provides more compression and better video quality. It is designed to provide high compression efficiency and which can be implemented effectively in resource constrained environments making it applicable to wide range of use cases. The processing in proposed system the frame rates can be modified and the frame rate is unlimited to the modification. HEVC uses a pre-processing step. It selects a number of best prediction modes. Then, using skip mode, motion compensation mode and joint prediction mode and bifurcate the frame. Finally, the adaptive prediction is used for generate the video and successfully compressed the video. The processing of the frames made for each pixel makes it better result. The conversion of video frames can be made as our required frame rates.

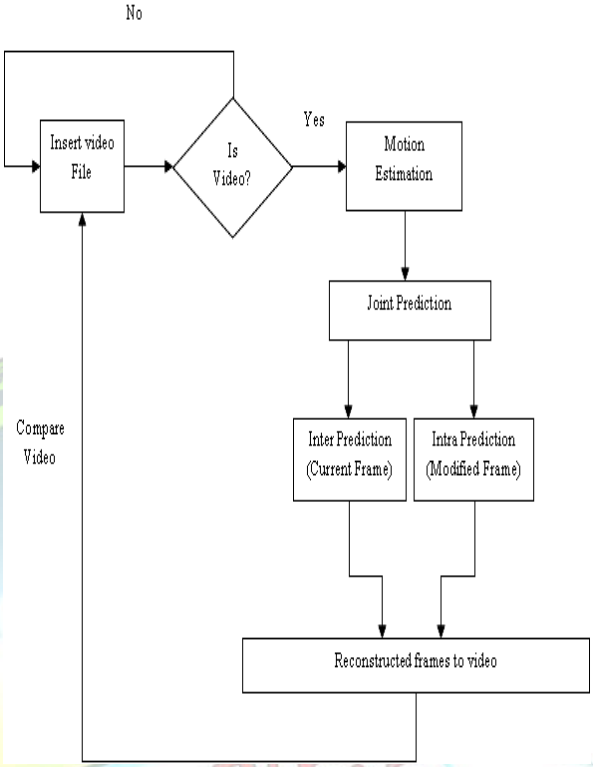


Fig1. Overall description of proposed work

V. METHODOLOGY

Video compression normally works on a bit of something shaped like a square groups of neighbouring pixels, often called macro blocks. These groups of neighbouring pixels or blocks of pixels are compared from one frame to the next. The scope of video with extra motion, more pixels modify from one frame to the next. When more pixels modified, the video compression scheme must send more information to stay away with the larger number of pixels that are evolving. In this paper, earliest work is to split the frames from video. The video has consists of frames and stored the defined path. The frames conversion done by joint prediction, the joint prediction code used to split the video into frames are inter and intra prediction. A High Efficiency Video Coding that consider them two and lead to better precision in most circumstances. The working operation done with single user interface.

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 20, April 2016

PROCESSING METHODS

In this paper, we have to analyse 5 types of methodology can be used for video compression and techniques. They are,

- Authentication
- Input-Streaming and File upload
- Frame bifurcation
- Frame enhancement
- Video generation

A) *Authentication*

Video authentication is a technique which ascertains that the substance in a given video is reliable and exactly same as when captured. For verifying the enhancement of received video content, and to detect malicious tampering and preventing various types of forgeries, performed on video data, video authentication techniques are used.

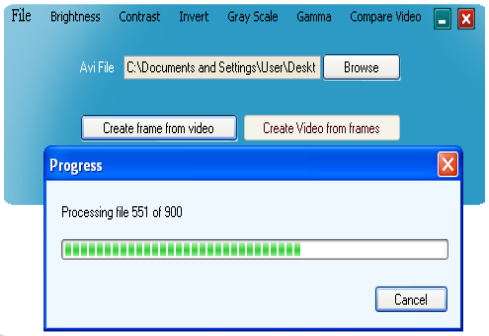
B) *Input-streaming and file upload*

Uploading video implies getting the digital video from hard drive into Path. Digital video must be saved in a supported file type such as Mpeg (.mpeg) and (.avi). AVI was not intended to contain video using any compression technique that requires access to future video frame data beyond the current frame. In this paper, this approaches to support modern video compression techniques (such as MPEG-H). The digital video camera or disk use the software provided with video camera or disk to transfer it to local hard drive. Before you start uploading video, you must store on particular specified path.

In larger computer system, the transfer of files from one system to another is known as uploading. From a network user's viewpoint, the set up to receive the file is uploading the file is send it to another computer.

C) *Frame Bifurcation*

A standard Video, which is otherwise called motion picture, can be characterized as a grouping of a few scenes. A scene is then characterized as a succession of a few seconds of motion recorded without interference. A scene for the most part has no less than three seconds. A movie in the video is appeared as an arrangement of still pictures, at a rate of 24 frames per second. Additionally, the motion picture originates from the way that a video, each frame is appeared for one small fraction of a second, more precisely milliseconds.



The meaning of a scene, where the frames are captured without interference, one can anticipate that consecutive frames to be quite similar to one another, as almost no time is permitted until the next frame is to be captured. The rest of each frame is quite similar to its previous frame. Such similarity between neighbors frames is known as “temporal redundancy”, while the similarity of pixels in a given frame is known as “spatial redundancy”. This type of redundancy is known as Spatiotemporal. Such similarity between neighbor’s frames is known as “temporal redundancy”, even as the similarity of pixels in a given frame is known as “spatial redundancy”. This type of redundancy is often called Spatiotemporal.

D) *Frame Enhancement*

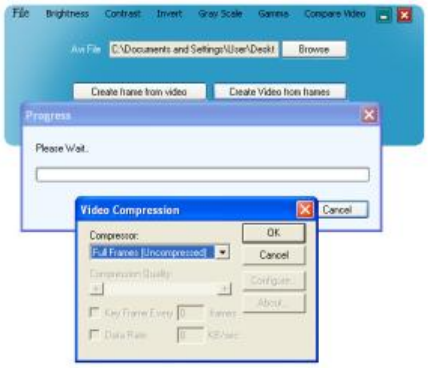
Using this option, the brightness of the selected video can be converted within a range of -255 to +255. The Contrast of the selected image can be set of user defined value within the range of -100 to +100.The images in the processing folder taken as input and the modification will likely be made. The selected image can be converted in to gray scale by way of utilizing this alternative. To invert the color properties of an image, this option can be used. Gamma corrections can be made from red, blue and green within the range of 0.2 to 5.The gamma value for each image has to be selected to create a modified frame. The extracted images used to make modification and the output used to create video. Using this option, values of various filters like red, blue and green can be changed. To flip the selected image, this alternative can be utilized. The various available options are original, vertical and horizontal.

E) *Video Generation*

Video compression stream has a inter frame which is expressed in terms of one or more neighboring frames. The "inter" a component of the term refers to the utilization of

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Special Issue 20, April 2016

Inter frame prediction. This kind of prediction tries to take advantage of temporal redundancy between neighboring frames, allowing achieving higher compression rates.



The term intra frame coding refers to the fact that the various lossless and lossy compression techniques are performed comparative to the information that is contained only within the current frame and not relative to any other frame in the video sequence. The outside of the current picture or frame is performed by no temporal processing. The images modified for our requisites and it is saved in the processed folder. The images in the processed folder used to create video utilizing the frame rate. The images are gathered and analysed and errors are fixed and video is generated.

VI. RESULT

High Efficiency Video coding (HEVC) standard that can enable better compression, at the cost of potentially increased processing power. Based on HEVC standard tool, experimental results prove that the combination of the proposed techniques achieves on average 50% bit-rate saving under the common test conditions used for HEVC development. The implementation result is expected to have better optimal performance.

VII. CONCLUSION

This paper has researched the compression efficiency of the newly developing video coding standards HEVC/H.265. We have to conclude this paper have confirmed that the main objective of the new standard to double the compression efficiency and also maintaining the same quality standard (i.e. H.265) has been achieved. The prediction errors reduced by 24.6% on average compared to the traditional inter/intra prediction approach. HEVC not only introduces a new prediction method, but also proposes a new Joint Prediction framework to replace the traditional Motion Estimation / DCT mechanism.

VIII. FUTURE ENHANCEMENT

The separation of the frame from video can be made with desired frame rate and in video conversion process the frame rate can be controlled and processing time has to be reduced. In future this technique will be supported in all types of media players for video compression.

REFERENCES

[1] K.Muller, H.Schwatrz, “3D High-Efficiency Video Coding for Multi-View Video and Depth Data”, IEEE Transactions on Image Processing, 2013

[2] J.R.Ohm, “Comparison of the Coding Efficiency of Video Coding Standards—Including High Efficiency Video Coding (HEVC)”, IEEE Transactions on Circuits and Systems for Video Technology, 2012

[3] J.Wang, “An efficient coding scheme for surveillance videos based on high efficiency video coding”, Natural Computation (ICNC), 2014

[4] B. Bross, W.-J. Han, G. J. Sullivan, J.-R. Ohm, and T. Wiegand, “High efficiency video coding (HEVC) text specification draft 8,” ITU-T/ISO/IEC Joint Collaborative Team on Video Coding (JCT-VC) document JCTVC-J1003, July 2012

[5] ITU-T, “Video Codec for Audiovisual Services at px64 kbit/s,” ITU-T Recommendation H.261, Version 1: Nov. 1990; Version 2: Mar. 1993

[6] “The H.264 advanced video compression standard", John Wiley & Sons, 2010

[7] H. Standard, G. J. Sullivan, J. Ohm, W. Han and T. Wiegand, "Overview of the High Efficiency Video Coding", vol. 22, no. 12, pp. 1649-1668, 2012

[8] Y. Chen ; L. Zhang ; V. Seregin ; Y. K. Wang, “Motion Hooks for the Multiview Extension of HEVC”, IEEE Transactions on Circuits and Systems for Video Technology (Volume:24 , Issue: 12), 2014

[9] D. Marpe, "Improved video compression technology and the emerging high efficiency video coding standard", 2011

IEEE International Conference on Consumer Electronics - Berlin (lCCE-Berlin)

[10] S. Bachu; K. M. Chari, ”A review on motion estimation in video compression”, Signal Processing And Communication Engineering Systems (SPACES), 2015

[11] F. Pereira, “Video compression: An evolving technology for better user experiences”,Telecommunication(CONATEL), 2011

[12] H. Schwarz, D. Marpe and T. Wiegand, "Overview of the scalable video coding extension of the H.264/AVC standard", IEEE Transactions on Circuits and Systems for Video Technology, (vol. 17, no. 9, pp. 1103-1120), September 2007