INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 4, Issue 3)

Available online at: www.ijariit.com

Multiple view video delivery system

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ABSTRACT

The Entertainment industry is acquired by the 3D technology after 2D, but now the one which gives more depth perception and the capability to view freely is the Multiview. Most of the improvements in video compression are based on the introduction of H.264/MPEG-4.H.264/MPEG-4 is the video coding standard from which multiple reference pictures are taken as the compression method. End-user expects to have free viewing points; this system overcomes the lack of free view and provides a high degree of freedom to the user to have a good experience. The system uses the broadcast and broadband network to deliver the videos. To deliver high volume multimedia adaptive Peer to peer network and the DVB (digital video broadcast network) are used. This system provides genuine 3D effect without glasses. It even helps to perform pixel-level editing.

Keywords: *3D technology, Multiview video, DVB (digital video broadcast network), H.264/MPEG-4.*

1. INTRODUCTION

The concept which strongly evolved after the 2D technology is the 3D technology which became popular over time in the research and even became popular in the entertainment industry. 3D technology embraced the cinema customers, the success in this field took this to the home televisions. There are 3D content and displays but it's not feasible to deliver over the current systems or over the stereoscopic 3DTV and hence it's not so popular. The factors which resulted in immersive experience are like limited depth effect, lack of free view point interactivity, motion parallax. These problems can be overcome by multiple views video delivery system.

Transportation technique is also evenly important along with the compression technique. Using MVV via the internet will provide the flexible solution in providing different rates of transmission to the different users depending on in what context they need. But providing this includes its own problems. The problems include Network failures may be a loss of packets because of various reasons. Along with this, there may be a problem of scalability with respect to served users. There are some of the coding techniques with respect to scalability and along with this error, resilience may help in reducing the network problems by adapting efficient bit rates.

The problem of providing a high volume of Multiview data can be effectively solved using the Peer to Peer overlay network. In server client model HTTP based video applications will work, the one which has taken a good momentum in this is the Adaptive streaming. One of the best examples for HTTP based video application is the MPEG's dynamic adaptive streaming [1], [2]. In this, the videos are encoded and stored on the Web server. Each video will be at different bit rates. Delivering the Multiple views of the same scene simultaneously to a large amount of users will become quite difficult and inefficient. But the client-server based models are the once which are widely studied if we compare with adaptive streaming of 3D media.

One of the best networks to deliver the multimedia contents to the home users is the digital video broadcast (DVB), which is also called as Terrestrial broadcast. If we compare DVB with the broadband network, the availability and reliability of DVB are higher. But DVB alone can't transmit the compressed multiple views of the scene as the videos have higher bit rate compared to stereoscopic content. So it's better to jointly combine digital video broadcast and broadband networks to help in transmission of multiple views of the same scene.

Some part of the video is carried by the DVB and rest by the peer to peer overlay network. The multimedia consumers are the peers. If the user is having more access to DVB then he can be assured with some level of guaranteed quality of experience. As the networks are independent synchronization of those two are needed. But sometimes we need to compensate delay difference for better rendering of multiple views.

It takes a long time to scale up the existing systems like broadcast networks and IP network techniques and to increase the quality of experience of the user. Multiview video gives

the extension for Multiview along with the depth perception, which gives more efficient and depth information. We are going to take frame compatible representation for stereoscopic 3D video, despite knowing there will be a reduction in the spatial resolution. These kinds of information's are signaled by MPEG-4 within the supplemental enhancement.

The successor of all these is the multiple views video delivery system. It exploits the redundancy which occurs in an interview and it improves the rate distortion performance by implementing disparity compensated prediction. The video of the same scene is going to be captured by the multiple cameras so storing or transmitting this huge amount data efficiently needs a good compression technique which is provided by H.264.

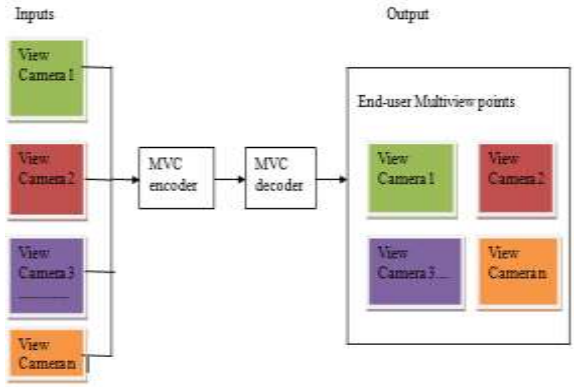

Fig 1.Common Structure of Multiple view video delivery system

The structure of Multiple Views video delivery system is shown in Fig.1.1. The videos of the same scene are captured by the multiple cameras giving multiple views. They are synchronized and fed to the multiview encoder to convert it to one-bit stream. At the receiver side, that one-bit stream is converted to N video signals by the multiview decoder.

2. RELATED WORK

Lukas was one of the individuals who did the underlying examinations on the coding of multiview pictures [3]. The idea of difference remunerated meeting forecast was presented. For 3D stereo picture pressure, the prescient coding approach was contrasted with 3-D piece move coding in the work done by Dinstein, et al [4]. Perkins introduced blended determination coding plan and a changing area strategy for divergence repaid forecast in [5].

In a global standard, the principal bolster for MVC is specified in a 1996 change [6]. In this exclusive two perspectives of coding frameworks were upheld. In this left view was the "Base view". In this whatever encoding was done that was good with normal single view decoders. The remaining is the correct view; it's encoded and is said as improvement see. For between see expectations it utilized the left view as the reference pictures.

For giving worldly adaptability some coding highlights were utilized like edge rate improvement, similar highlights were utilized for this plan. Similar essential coding devices were utilized for improvement see as in normal H.262/MPEG-2 video coding yet some change was done on picking the reference pictures with the goal that the photos were browsed the upgrade see or from the base view.

There are numerous advancements in video pressure systems and likely requirements for best in the class coding of multiview video, in October 2005 for productive MVC innovation MPEG issued a call for the proposition. In spite of the fact that not an unambiguous essential at the time, every one of the reactions was relied upon H.264/MPEG-4 AVC and they incorporate either type of between see forecast [7]. There were some subjective tests done in contrast with free simulcast coding of perspectives in view of H.264/MPEG-4 from these investigations a few picks up in visual quality were watched. MVC arrangements came to up to 3 Mean Opinion Score focuses more visual quality than the simulcast H.264/MPEG-4 for less and medium piece rate coding, when it was contrasted and visual quality at consistent piece rate and even it accomplished 1 mean feeling score point greater quality for high piece rate coding. To give more visual quality than the H.264/MPEG-4 coded stays, few proposed MVC arrangements required just about a large portion of the bit rate, this was given when contrasting piece rates with a few of the test successions.

Outstanding amongst other visual characteristics over the vast scope of test successions and rate focuses was proposed. The primary purpose of this proposition was it didn't change any lower level linguistic structure and deciphering forms which were utilized by H.264/MPEG-4, with no recognizable surrender of pressure capacity. This was a purposeful plan include. This element made to actualize MVC decoders to require just a fairly simple and obvious change to existing H.264/MPEG-4 disentangling chipsets. Due to every one of these favorable circumstances this proposition was picked as the underlying purpose of MVC venture. Later this was called as the joint multiview display form 1.0.
In the hole of a half year every one of the reactions to calling for proposition were considered and taken after, exhaustive assessment is done on the coding plans said. To accomplish high pressure this proposition utilized various leveled expectation in time and also in see measurements. Be that as it may, based on gathering of pictures the perspectives were encoded in an interleaved way, this made real postponement and even did not allow for concurrent interpreting and yield sees at agave time moment.

3. METHODOLOGY

To solve the problems like Motion parallax which is the dissimilarity in the apparent place of an object this is viewed along two different lines of sight. Limited Depth effect which is less blurring the background and not focusing on the object and Lack of free view point, it does not different points to the view the video to the user there is a method which is developed called multiple views video delivery system.

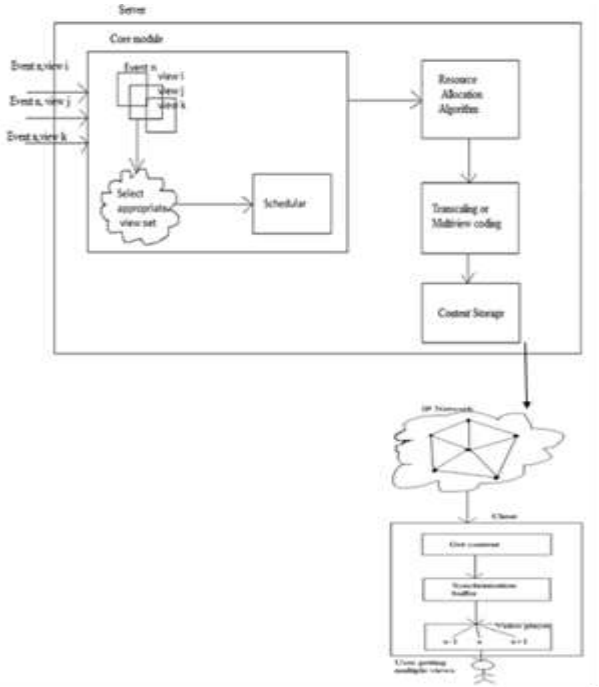

Fig.2 shows the design of multiple views video delivery system

The design of multiple views video delivery system is shown in fig 2.This system includes the following:

Server: This includes most important parts of the system like Core module, which includes multiple views of the same scene taken from different angles of the camera. The appropriate view set of the scenes are chosen and are scheduled. Then required an amount of storage, resources are allocated and it's coded using multiview coding then it's authenticated and transmitted over the network.

Network: Minimum amount of bandwidth required for upload and downloading is 128kbps for standard definition and the maximum is 1.2-5Mbps for download and 512kbps-1.5Mbps for upload. The same basic things are utilized for the transmission of the multiple videos over the network

Client: Client is going to get the multiple videos sent by the server then they are synchronized and stored in the synchronized buffer and are played showing multiple views. The end user will get multiple views on single screen he can view whichever he wishes for.

4. IMPLEMENTATION

Fig 3 Used case diagrams

A. Used Cases

Capture the video:

Uploader or the user needs to capture the video with the multiple perspectives before uploading. The user should have a set of videos.

Authentication: As an authentication, part registration should be done by the end user by providing his details like name, phone number, DOB, Password, and email.

Upload video: If the user is done with registration later he can upload the captured video by logging into the application.

Authentication response:

When the uploader or the viewer finishes their authentication part which is registration and login then an admin needs to respond to the further queries.

Transcoding: The videos of the similar scene have some similar qualities at some of the points. They all together are combined and the contents are coded.

Transmission: After coding part now it needs to be transmitted over the ip network to the end user who is having the access.

Video request: End-user needs have the access then only he can make the request for viewing the videos.

Play video: The desired videos according to the viewer are played in streams. Synchronization buffer will help for this purpose.

B. Requirements for Implementation:

Operating system: Windows 7/8/10
Application requirement: Tomcat 8.0
Server-side script: JSP/Servlet
Database: MySQL
Database connectivity: JDBC
IDE: NetBeans
Processor: Intel i3 and above
Hard Disc: 80GB
RAM: 2GB

5. EXPERIMENTAL RESULTS

Fig 4 Multiple views video delivery system

To get the videos user needs to register initially as a part of authentication. Multiple perspectives of the same scene is displayed on the screen as shown in fig 4. This displayed to only those users who have access that is got via registration and login.

6. CONCLUSION AND FUTURE WORK

Recently among the industry, standardization forums and academic researchers three-dimensional video have taken a significant attention. The center of any multiple views video is the efficient representation and compression of the video, because this gives the format which can be created, stored, transmitted and displayed. This project showed the view of H.264/MPEG-4. Multiple views video delivery shows the improved compression and enables the inter-view prediction of the video. One more important is the representation, coding, and signaling frame formats. It shows the transfer of the multiple views of the same scene.

We are now witnessing the rollout of three-dimensional technologies services and the equipment which are based on these technologies. To support the emerging types of videos autostereoscopic displays will be needed. As there is the 360^0 view of the image we can even combine the views taken from the different angle of the same scene and combine it to form the 360^0 view of the video.

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