A MULTIVIEW 3D VIDEO QUALITY ENHANCEMENT USING CAMERA CONTROL METHOD

[1]Sonam Arora, [2]Rajbhupinder Kaur
Department of Computer Engineering, Punjabi University
Yadavindra College of Engineering, Talwandi Sabo
Punjab, India
Email: [1]Sonamarora413@gmail.com

Abstract- As video observation gear's and cell phones, for example, advanced cameras, PDAs and netbooks are progressively broadly conveyed, cameras are relied upon to procure, record and here and there pack and transmit video content in all lighting and climate conditions. Multiview video caught by multi-camera structures has been broadly utilized as a part of numerous applications, for example, observation, 3D TV, and free perspective TV. In the wake of catching, the multi-camera framework for the most part requires to pack a lot of multiview information because of confinements on the transmission limit. In the particular analyses an issue of camera control in multicamera frameworks for video quality upgrade at a restricted piece rate. A novel camera control was created for multicamera frameworks to catch recordings. Motor camera are utilized to change their dish edges and central lengths at the video securing stage. The camera control makes up for both item area distinction and shading irregularity among camera perspectives and, in this manner, enhances video quality when the crude multi view video is packed at a restricted piece rate.
Keywords: cost function, focal lengths, Mean Squared error(MSE), pan angles, Peak signal-to-noise ratio (PSNR).

I. INTRODUCTION

With the advancement of digital imaging and the rapid development of electronic technology, imaging sensors are produced, capable of acquiring good quality digital images with a high-resolution. At the same time, the cost and size of the sensors have been reduced. This has led to an extensive research interest for techniques that use images obtained by multiple camera arrays. Methods that use a multiple camera array are not limited to capturing only static scenes, like ones which use multiple images captured by translating or rotating a single camera to different positions. Multi-camera applications use acquired images in different ways, such as combining entire images or applying computational methods on a number of distinct camera images. Nevertheless, all of these approaches suffer from performance degradation, which is due to inter-camera colour response variations inherent for camera arrays that have not been colour calibrated. There are several factors that contribute to inter-camera colour response discrepancy. Camera sensors differ, even between cameras of the same model under equal parameter settings. The colour of the illumination in the scene may vary over time. The viewing angle, i.e., the image capture geometry may be different for cameras in the array due to camera placement in the scene. Additional errors arise from noise produced by the camera's electronic circuitry and image acquisition process. Hence, the goal of calibration for a multi-camera array is to ensure a consistent inter camera colour response. Multi-camera systems have been attracting much attention in recent years. In a multicamera system, multiple cameras capture a Scene from different viewpoints to form a multiview image/video, which is widely used in many applications such as surveillance [1], three dimensional television (3DTV) [2] and free viewpoint television (FTV). Upon capturing the

signal, a multi-camera system requires the transmission, storage and processing (including compression and rendering) of a vast amount of multiview data. Distortion or artifacts are usually witnessed in the reconstructed multiview video after a 2 raw multiview video is compressed at a limited bit-rate. The compression performance affects the rendering quality [4].The better the compression performance, the better the rendering quality. Therefore, efficient compression is beneficial to provide users with high-quality videos. As multiview data originate from the same scene, special and temporal similarities exist between images, which are exploited in multiview video compression algorithms. However, significant variations in both object location and colour are generally observed among images captured by different cameras. Such object location difference and color inconsistency reduce the similarities between raw images, and therefore impair the compression performance during the subsequent stage at a limited bit-rate. Moreover, the inter camera color inconsistency usually affects the user experience negatively when camera views are switched during the video broadcasting. In theory, the more similar
the images are, the lower the distortion when a raw multiview video is compressed at a limited bit-rate. Therefore, in order to improve the compression performance of multi-camera systems at a limited bit-rate, it is beneficial to compensate for both object location difference and color inconsistency among camera views at the video acquisition stage. The inter-camera color inconsistency is caused by many factors such as lighting condition, camera orientation, focal length, and camera internal setting like exposure, focus and white balance. Fig. 1.1 gives the color responses of a camera in two cases: 1) with different focal lengths; 2) with different orientations. It shows that camera orientation and focal length have significant effects on image color (the luminance in each image is obviously different). The object location difference is due to different camera internal parameters such as focal length, principal point and aspect ratio, and different extrinsic camera parameters such as position and orientation. Therefore, camera orientation and focal length affect both object location difference and color inconsistency among camera views. Color calibration (correction) has attracted considerable attention. For a multi-camera system, the goal of color calibration is to ensure color consistency among camera views. There are mainly two methods for color calibration: on camera adjustment and post-processing. The former seeks proper camera gain and additive offset to produce a desired color response [5]. The latter refines images after acquisition. However, until now, no attention was paid to compensating for inter3 camera color inconsistency at the acquisition stage by adjusting camera parameters. Camera control is an important component for multi-camera system design. Nevertheless, most work on multi-camera systems focused on system architectures, camera calibration, object tracking, video delivery, image rendering .Up to now, much less attention is paid to camera control. For example, Lou et al. required slave cameras to pan and/or tilt in order to point to the same interest point as the master camera in their multiview video system, but they did not give the pan/tilt velocity or angle during the operation [6]. Zhangand Chen gave a set of simple camera commands such as "move left", or "move right", and "stop" for their mobile camera array to find the optimal camera positions in order to get the best rendering quality for a given set of virtual views [7]. Turaga and Ivanov designed a system with 6 pan tilt zoom cameras to monitor indoor space, in whichadditional155 motion sensors were used to offer a global view of the activity in their door space [18]. They developed camera control strategies, but did not specify the camera pan/tilt/zoom value.4

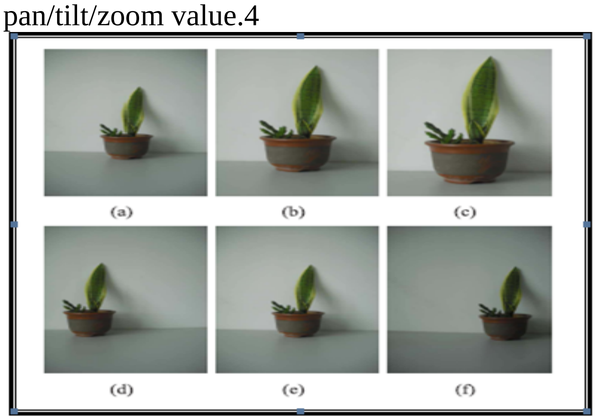

Fig.1 Color responses. (a)-(c) Color responses of a camera with different focal lengths. (d)-(c) Color responses of the camera with different orientations [1]

II. EXISTING APPROACH

This considered a problem of camera control in multicamera systems for video quality enhancement at a limited bit-rate. A novel camera control was developed for multicamera systems to capture videos. Individual cameras are controlled to adjust their pan angles and focal lengths at the video acquisition stage for both object location difference and color inconsistency among camera views and, therefore, improve Moreover, the resulting inter-camera color consistency will provide a better user experience when camera views are switched during the video broadcasting. The developed camera control provides a method to design new multi-camera systems whose spacial camera configurations can be in any form. Three casio cameras are used .each camera is equipped with a pan unit. Each camera is initially placed such that its image plane is perpendicular to the ground. The field of view of each camera is wide enough to cover the object of interest. All cameras are off-line calibrated before their operation, and their internal settings, such as white balance, focus, and color filter, are set to the same mode. The lighting condition is constant.

III. PROPOSED TECHNIQUE

We used motor camera to adjust pan angle and focal length. The technique used in proposed work is DCT Block Processing with camera control method.

1. start
2. set the stepper motor
3. set the camera and motor with their com port no.
4. Adjust the frame size according to camera.
5. With the help of linear phase algorithm set the controller.
6. Capture the frame in the form of jpg. and process the based on the steppar motor focal length and pan angle.
7. Capture the different moments of movable motor and camera i.e. left side, right side and middle.
8. Apply block wise DCT technique.
9. Find the PSNR and MSE of captured frame.
10. Analyze the result.
11. Repeat the step 1 to 10 on different categories.
12. Stop.

IV. RESULTS

Results deal with the output. The main focus of our research study is on to improve the video quality. This is done by applying camera control method by using steppar motor and by using DCT Block Processing. The main parameters of our research is psnr, mse focal length and pan angle. In this we show the comparison of existing and proposed technique by a table. We analyze the performance of our research on the basis of PSNR and MSE.

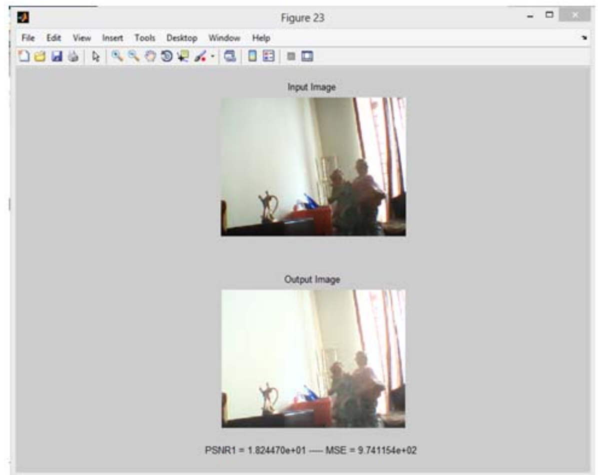

Fig.2. results with PSNR and MSE for middle image

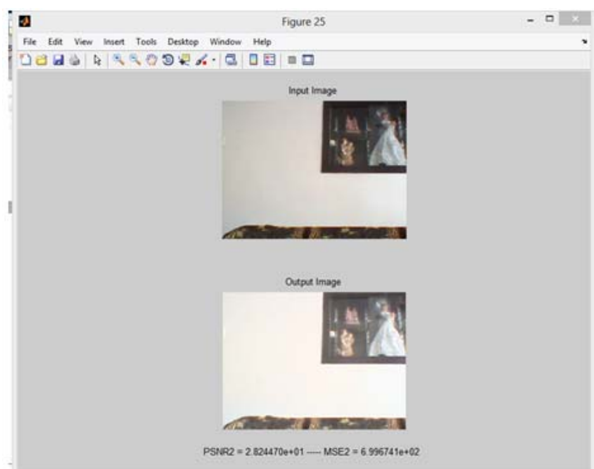

Fig.3. results with PSNR and MSE for left image

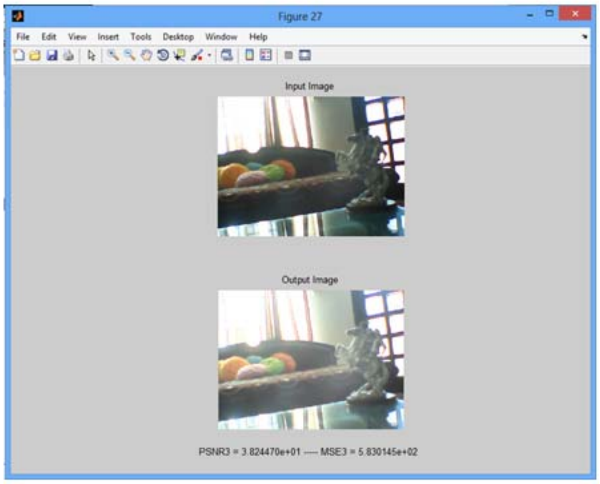

Fig.4. results with PSNR and MSE for right image

Sr.no.	Category of video	PSNR		MSE
1	Middle	new=1.824	old=.5	9.741
2	Left	new=2.84	old=.1.9	6.996
3	right	new=3.74	old=1.9	5.830

Table1.Using PSNR and MSE

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V. CONCLUSION

In this paper we have studied the existing approach DCT block processing and camera control method to improve the 3d video quality enhancement. We have discussed how DCT and camera controlling helps in improving psnr and calculate mse.It also helps in adjusting pan angle and focal length.

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