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Review on Algorithms for Video Quality Measurement

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ABSTRACT: Digital video typically pass through several processing stages before they reach the end user of the video so it degrade the quality of the video. If we do not apply the algorithms on video then the user can't find the purity of video, so that the VIIDEO algorithm is introduced. Video pass through many process before they reach the user in between that process much more noise is added in the video. So for avoiding that noise or distortion in the video we apply different algorithms. The algorithm is able to predict the quality of distortion. PSNR algorithm is used to find the noise in the video. Another algorithm is VIIDEO algorithm. This algorithm is apply on the system when frame is extracted from the video. Frame difference is also calculated between two video frames original video and the distorted video. The Peak Signal-to-Noise Ratio algorithm is compare with the Video Intrinsic Integrity and Distortion Evaluation algorithm. In the system there is collection of video in the database from that database we take original video and distorted video then extract the frame from the video. After extraction, algorithm is apply and also check the frame difference between original video and distorted video and then we get the distorted value for original video and distorted video. By using VIIDEO algorithm user can find the distortion in the video and they get the pure video. The PSNR algorithm is used to find the noise in the video. By comparing this algorithms VIIDEO algorithm is better. It will find more distortion in video. In the system original video and distorted video is given as an input and then frame is extracted. Then pre-processing is there and apply algorithm for finding distortion. The VIIDEO is able to predict the distortion of video. The VIIDEO and PSNR algorithm is compared and from that comparison VIIDEO algorithm is better.

KEYWORDS: Intrinsic Video Statistics, Quality Assessment, Video Intrinsic Integrity and Distortion Evaluation (VIIDEO) Algorithm, Peak Signal-to-Noise Ratio (PSNR) Algorithm.

I. INTRODUCTION

Video quality is a characteristic of a video passed through a video transmission/processing system, a formal or informal measure of perceived video degradation. Video quality evaluation is perform to describe the quality of a set of video sequences under study. Video quality can be evaluated objectively (by mathematical model) or subjectively (by asking users for their rating).The Video Intrinsic Integrity and Distortion Evaluation Oracle (VIIDEO) is able to predict the quality of distorted video without any external knowledge about the pristine source, anticipated distortion or human judgment of video quality. This algorithm does not require the use of any additional information. The VIIDEO algorithm performs much better than the full reference quality measure MSE on the LIVE VQA database [1].

Digital videos are increasingly finding their way into the day-to-day lives of people via the explosion of video applications such as digital television, digital cinema, Internet videos, video teleconferencing, video sharing services such as youtube, Video on Demand (VoD), home videos and so on. Digital videos pass through several processing stages before they reach the end user of the video. The effect of most processing stages is to degrade the quality of the video that pass through it [11].

The Peak Signal-to-Noise ratio (PSNR) is also used to predict the distortion of video. In this paper we compare the PSNR and VIIDEO algorithm and in between that VIIDEO algorithm is better than the PSNR algorithm in performance. PSNR is a simple function of the Mean Squared Error (MSE) between the reference and test videos and

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provides a baseline for objective VQA algorithm performance [11]. PSNR is most easily defined via the Mean Squared Error (MSE).

Scope-

1. To study blind video integrity for finding the distortion in video by using different algorithms.
2. Compare different algorithms for finding distortion in video.
    - Video Intrinsic Integrity and Distortion Evaluation Oracle (VIIDEO) Algorithm [1].
    - Peak-Signal-to-Noise-Ratio (PSNR) Algorithm [11].

Objective-

1. To measure the distortion from the video by using the VIIDEO algorithm.

II. RELATED WORK

In recent years there are many algorithms which are used for the video quality measurement. Manufacturer and content delivery networks including broadcast, cable and IPTV operators must continually assess their product and service quality. Video quality measurement system improve productivity and dramatically reduce the time to market with a fully tested product or service.

Now a days there is increase the use of digital data, on the data traffic there is more than 50% of data is the video data that should be wired or wireless. For controlling this traffic and predict the quality of data there is the quality analyser. The new algorithm which are invent in this paper is based on Video Quality Analyser that is Video Intrinsic Integrity and Distortion evaluation Oracle (VIIDEO) algorithm, which is used to predict the quality of the video without any external knowledge [1].

They propose a blind (no reference or NR) video quality evaluation model that is non-distortion specific. Image and video quality assessment (I/VQA) researchers have been working to understand how distortions introduced throughout the lossy path between the source and destination affect the statistics of multimedia signals and how these distortions affect perceived signal quality. The most accurate way to assess the quality of an image or a video is to collect the opinions of a large number of viewers of the image/video in the form of opinion scores that rate the visual quality of the image or video [2].

Finding ways to monitor and control the perceptual quality of digital visual media has become a pressing concern as the volume being transported and viewed continues to increase exponentially. This paper discusses the principles and methods of modern algorithms for automatically predicting the quality of visual signals. By casting the problem as analogous to assessing the efficacy of a visual communication system, it is possible to divide the quality assessment problem into understandable modelling sub-problems. They will visit models of natural images and videos, of visual perception, and a broad spectrum of applications [3].

An important aim of research on the blind image quality assessment (IQA) problem is to devise perceptual models that can predict the quality of distorted images with as little prior knowledge of the images or their distortions as possible. The new IQA model, which we call the Natural Image Quality Evaluator (NIQE) is based on the construction of a quality aware collection of statistical features based on a simple and successful space domain natural scene statistic(NSS) model. These features are derived from a corpus of natural, un-distorted images [4].

A family of reduced reference video quality assessment (QA) models is utilize spatial and temporal entropic differences. The spatial and temporal information differences are combined to obtain the spatio-temporal-reduced reference entropic differences. The algorithms are flexible in terms of the amount of side information required from the reference that can range between a single scalar per frame and the entire reference information. There is used LIVE video quality assessment database [5].

It introduce a new video quality database that models video distortions in heavily tracked wireless networks and that contains measurements of human subjective impressions of the quality of videos. The new LIVE Mobile Video Quality

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Assessment (VQA) database is used in this paper. Compare the quality ratings obtained from the tablet and the mobile phone studies in order to study the impact of these different display modes on quality. It evaluate several objective image and video quality assessment (IQA/VQA) algorithms with regards to their efficiency in predicting visual quality [6].

No-Reference algorithm is use for the video quality evaluation. The algorithm relies on a natural scene statistics (NSS) model of video DCT coefficients as well as a temporal model of motion coherency. The proposed framework is tested on the LIVE VQA database, and shown to correlate well with human visual judgments of quality [7].

ST-MAD employs spatio-temporal images (STS images) created by taking time-based slices of the original and distorted videos. Motion artifacts manifest in the STS images as spatial artifacts, which allows one to quantify motion-based distortion by using classical image-quality assessment techniques. STMAD estimates motion-based distortion by applying MADs appearance-based model to compare the distorted videos STS images to the original videos STS images [8].

The (NR)/blind algorithm the Distortion Identication-based Image Verity and Integrity Evaluation (DIIVINE) indexthat assesses the quality of a distorted image without need for a reference image. DIIVINE is based on a 2-stage framework involving distortion identification followed by distortion-specific quality assessment. DIIVINE is capable of assessing the quality of a distorted image across multiple distortion categories, as against most NR IQA algorithms that are distortion-specific in nature [9].

It is important that automatic methods of video quality assessment (VQA) be available that can assist in controlling the quality of video being delivered to this critical audience. The quality of motion representation in videos plays an important role in the perception of video quality, yet existing VQA algorithms make little direct use of motion information, thus limiting their effectiveness. Video quality is evaluated not only in space and time, but also in space-time, by evaluating motion quality along computed motion trajectories [10].

Digital videos typically pass through several processing stages before they reach the end user of the video. The effect of most processing stages is to degrade the quality of the video that passes through it. The Peak Signal-to-Noise Ratio (PSNR) algorithm are used in this paper for measuring the distortion in the video. PSNR is a simple function of the Mean Squared Error (MSE) between the reference and test videos and provides a baseline for objective VQA algorithm performance [11].

Area V2 is a major visual processing stage in mammalian visual cortex, but little is currently known about how V2 encodes information during natural vision. To determine how V2 represents natural images, we used a novel nonlinear system identification approach to obtain quantitative estimates of spatial tuning across a large sample of V2 neurons. Results provide a new perspective on how complex shape selectivity arises, emphasizing the role of suppressive tuning in determining stimulus selectivity in higher visual cortex [12].

Database containing subjective assessment scores relative to 78 video streams encoded with H.264/AVC and corrupted by simulating the transmission over error-prone network. It provide a balanced and comprehensive database to enable reproducible research results in the field of video quality assessment. In order to support research works on Full Reference, Reduced-Reference and No-Reference video quality assessment algorithms, both the uncompressed files and the H.264/AVC bit-streams of each video sequence have been made publicly available for the research community, together with the subjective results of the performed evaluations [13].

It deals with texture analysis based on multi-scale stochastic modelling. Asymmetric Generalized Gaussian density as a model to represent detail sub-bands resulting from multi-scale decomposition. A fast estimation method is presented and closed-form of Kullback-Leibler divergence is provided in order to validate the model into a retrieval scheme [14].

Measurement of visual quality is of fundamental importance for numerous image and video processing applications, where the goal of quality assessment (QA) algorithms is to automatically assess the quality of images or videos in agreement with human quality judgments. The ground truth image quality data obtained from about 25000 individual

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human quality judgments is used to evaluate the performance of several prominent full reference image quality assessment algorithms [15].

III. PROPOSED SYSTEM

We explain our 'quality aware' natural video statistics model in the space-time domain and describe the relevant temporal features that are derived from it and used to model inter sub band correlations over local and global time spans. The overall model, which we call video intrinsic integrity and distortion evaluation oracle, is the basis of a video intrinsic integrity and distortion evaluation oracle algorithm that predicts video quality in a manner that correlates quite well with human judgments of video quality. We compare the performance of video intrinsic integrity and distortion evaluation oracle against existing state-of-the-art FR and NR video quality assessment approaches. Before we describe the statistical and perceptual underpinnings of the video intrinsic integrity and distortion evaluation oracle model in detail, we review relevant prior work in the area of video quality assessment. We described how the inter sub band correlations can be used to quantify the degree of distortion present in the video and hence to predict human judgments of video quality.

IV. SYSTEM ARCHITECTURE

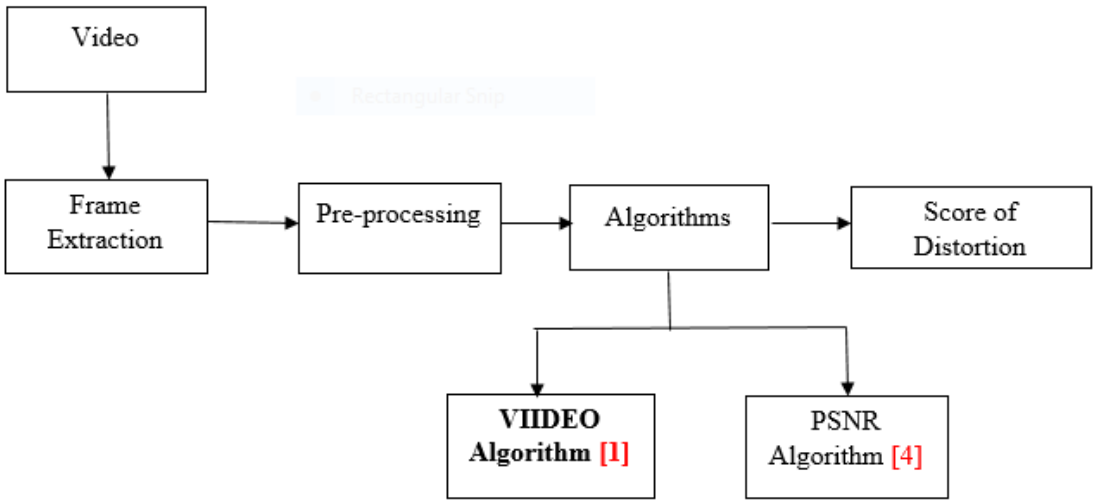

Figure 3.1: Video Quality Measurement Architecture

V. CONCLUSION

We study the completely blind natural video statistics based quality assessment model- Video Intrinsic Integrity and Distortion Evaluation Oracle (VIIDEO). VIIDEO is used to predict the distortion of video. VIIDEO algorithm is perform much better than the full reference quality measure Peak-Signal-to-Noise Ratio (PSNR) algorithm on LIVE VQA database. For finding the PSNR mean squared error is used. VIIDEO does not require any distortion knowledge in the form of exemplar training videos containing anticipated distortions, or human opinions of video quality, distorted or otherwise. By the overall study VIIDEO algorithm is give better result to predict the video as compare to the PSNR algorithm.

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