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Adjustment of Video Colorization Process

Atul Tiwari [1], Rajneesh Pachouri [2]
Scholar [1], Assistant Professor [2]
Department of Computer Science and Engineering
RGTU/AIST, Sagar
M.P - India

ABSTRACT

In this work, we propose an enthusiastic video colorization technique logically through constrained shading references in a video arrangement. The proposed strategy first gauge movement vectors between a monochrome edge and shaded reference outlines for introductory coordinating by signal stream. At that point it exchanges shading data to coordinated focuses in the monochrome edge and additionally spreads shading data of coordinated focuses to other parts of the monochrome covering. Moreover, we plan a multi-frame reordering refinement to colorize video groupings completely. Exploratory outcomes show that the proposed strategy accomplishes much better execution in video colorization than cutting edge strategies.

We also want to find features to classify the foreground moving objects, an easy task for a human, but a complex task for a computer. Video has been captured with a bird's eye view close to one of the entrances at the school about ten meters above the floor. From this video troublesome parts have been selected to test the changes done to the algorithms and program code.

We are currently experiencing an exceptional growth of visual data, for example, millions of photos are shared daily on social-networks. Image understanding methods aim to facilitate access to this visual data in a semantically meaningful manner. In this dissertation, we define several detailed goals which are of interest for the image understanding tasks of image classification and retrieval in this work we use of MATLAB R 2013a tool for simulation.

***Keywords* :-** High Definition (HD), High Efficiency Video Coding (HEVC), Video Coding Expert Group (VCEG), Moving Picture Experts Group (MPEG), Joint Collaborative Team on Video Coding (JCT-VC).

I. INTRODUCTION

Currently experiencing an exceptional growth of visual data, for example, millions of photos are shared daily on social networks. Image understanding methods aim to facilitate access to this visual data in a semantically meaningful manner. In this dissertation, we define several detailed goals which are of interest for the image understanding tasks of image classification and retrieval.

The goal of the project was to build a significant part of the visual system by a cohort of students, and more specifically to map the camera input to a description in terms of objects and background. This artificial vision system could be used as an input for high-level cognitive tasks such as reasoning and planning. It was thus required to mimic human intelligence or as a component for intelligent robots.

As image sizes and bit depths grow larger, software has become less useful in the video processing. Real-time systems such as those that are the target of this project are required for the high speeds needed in processing video. In addition, a common problem is dealing with the large amount of data captured using satellites and ground-based detection systems. DSP systems are being employed to selectively reduce the amount of data to process, ensuring that only relevant data is passed on to a human analyst. Eventually, it is expected that most video processing can and will take place in DSP systems, with little human interaction. This is obviously advantageous, since human data analysts are expensive and perhaps not entirely accurate.

One of the most difficult problems is people occlusions, where the camera has a limited view of each individual in a group. This will be the main focus of this thesis, to separate each individual from a group. Some work in the area of people flow estimation uses multiple cameras to create 3D models of the scene and its contents, this is however too slow to be used in real-time due to complex algorithms and is heavily dependent on good calibration of the cameras. Though multiple cameras are the most accurate, a single camera will be used in this project.

For computer vision systems, which people counting system is part of, the first challenge is to separate moving objects from the background (foreground and background separation).

There are several proposed methods to do this, which can be grouped into two groups: foreground subtraction, background subtraction or directly by modelling either the objects of interest or the background pixel values. In the rest of this section we will discuss each of these types of techniques and focus on background subtraction since it is the former technique in this work.

The Gaussian distributions of the adaptive mixture model are then evaluated to determine which are most likely to result from a background process. Each pixel is classified based on whether the Gaussian distribution which represents it most effectively is considered part of the background model.

Foreground objects can then be traced, and are evaluated when the object is left static. For the focus of this paper is to track objects people leave, like luggage at an airport, that in recent years has become a security concern to many surveillance applications as a response to increased threat from terror groups. The Gaussian mixture method should be more robust to shadows and changes in lighting conditions. This refers to our visual system ability to extract features of important regions in an image and group them to make a meaningful structure. This algorithm first estimates the motion from consecutive frames and uses this information to help background subtraction. The idea is that even if it is impossible to distinguish the boundaries between two objects at a particular frame, they most likely can be cleanly distinguished in another frame. Motion information from a sequence of images can also provide useful data for detecting boundaries, merging regions belonging to the same object and solving occlusion problems. It was found that using an object model is a good improvement for the segmentation and a possible way of dealing with occlusions.

Recently, there are many works aiming to relieve the site survey burden, which we broadly classify into correlation aware approach, crowd sourcing-based approach, and sparsely-aware approach. The correlation-aware approach leverages the fact that the fingerprints at nearby reference points are spatially correlated. For example, [17] utilized the trigging interpolation method while [18] adopted the kernel functions (continuous and differentiable discriminate functions) and proposed an approach based on discriminated minimization search. Such schemes try to use linear or nonlinear functions to model the correlations, which are essentially model-based approaches and face similar limiting factors as discussed before.

II. ERA OF VIDEO PROCESSING

THE High Efficiency Video Coding (HEVC) average is the majority current combined video scheme of the ITU-T Video Coding Expert Group (VCEG) and the ISO/IEC Moving Picture Experts Group (MPEG) consistency organization, operational simultaneously in a corporation known as the Joint Collaborative Team on Video Coding (JCT-VC) [1]. The first edition of the HEVC standard is expected to be finalized in January 2013, resulting in an aligned text that will be published by both ITU-T and ISO/IEC. Additional work is planned to extend the standard to support several additional application scenarios, including extended-range uses with enhanced precision and colour format support, scalable video coding, and 3-D/stereo/multitier video coding. In ISO/IEC, the HEVC standard will become MPEG-H Part 2 (ISO/IEC 23008-2) and in ITU-T it is likely to become ITU-T Recommendation H.265.

From then on, vision and image understanding have been studied from different perspectives. For example, from the field of cognitive psychology, aiming at understanding human perception, from the field of physics, focusing on modelling physical properties of light emission and surface reflections in images, and from the field of computer science, striving for automatic systems for various vision tasks, like 3D reconstruction and object recognition. The binding factor of these research interests is the use of computers to model and test different theories and methods.

A few decades later we can only conclude that complete understanding of the human visual system is still elusive, although we know some of its principles. Also that the automatic image understanding of a two years old child remains an unreachable goal in computer The difficulty is partly explained by the fact that scene understanding and object recognition are inverse problems, in which we try to recover an understanding of the world given a single or multiple images. It is surprising that humans do this so effortlessly with a very high accuracy, despite the complexity of the task. The visual world in its full complexity is difficult to model, because of the enormous amount of different concepts, the infinite possibilities to project a 3-dimensional scene onto a 2-dimensional image plane, and due to complex scenes with different levels of occlusions and different lighting conditions. Furthermore, there exists a high intrinsic variability in the appearances of objects of the same class. This is even strengthened by visual ambiguity, when two different concepts have a similar appearance, and also by semantically ambiguity, when a single concept has multiple meanings.

Statistical methods allow for the learning of the parameters of a model from large-scale data sets. Once estimated, these models allow for making predictions for previously unseen images. Learning the parameters of these models requires a training set of supervised examples. For image classification these examples could consist of images together with a class label. In addition, an image representation is required, which should be rich enough to encode the relevant visual information of an image.

Video colorization aims to add colour information to a set of monochrome frames in the video sequence. In recent years, it has been an important research topic and attracted much attention in the research community due to its wide applications in video restoration of old black-and-white films, video compression etc.

Generally, video colorization methods can be classified into two categories based on information transferred ways among video frames. The first category transfers colour information of scribbles drawn by users to other frames [1] transferred scribbles of the marked frame among video frames and propagated colour information of the scribbles by solving a quadratic function [2] exploited geodesic distances as weights to transfer colour information of the scribbles [3] transferred scribbles to other video frames by calculating motion vectors with initialized weights. [4] Designed a video colorization method in a spatiotemporal manner to preserve temporal coherence.

Video coding standards have evolved primarily through the development of the well-known ITU-T and ISO/IEC standards. The ITU-T produced H.261 [2] and H.263 [3], ISO/IEC produced MPEG-1 [4] and MPEG-4 Visual [5], and the two organizations jointly produced the H.262/MPEG-2 Video [6] and H.264/MPEG-4 Advanced Video Coding (AVC) [7] standards.

The two standards that were jointly produced have had a particularly strong impact and have found their way into a wide variety of products that are increasingly prevalent in our daily lives. Throughout this evolution, continued efforts have been made to maximize compression capability and improve other characteristics such as data loss robustness, while considering the computational resources that were practical for use in products at the time of anticipated deployment of each standard.

The major video coding standard directly preceding the HEVC project was H.264/MPEG-4 AVC, which was initially developed in the period between 1999 and 2003, and then was extended in several important ways from 2003–2009. H.264/MPEG-4 AVC has been an enabling technology for digital video in almost every area that was not previously covered by H.262/MPEG-2 Video and has substantially displaced the older standard within its existing application domains. It is widely used for many applications, including broadcast of high definition (HD) TV signals over satellite, cable, and terrestrial transmission systems, video content acquisition and editing systems, camcorders, security applications, Internet and mobile network video, blue-ray Discs, and real-time conversational applications such as video chat, video conferencing systems.

In these studies, the video colorization method is designed by simply transferring color information of scribbles to other frames. However, there might be some artifacts in these methods because scribbles drawn for a particular frame may not be suitable for others. Moreover, with the limited colour information provided by sparse scribbles, monochrome frames cannot obtain a promising colorized result similar to the ground truth. Additionally, these video colorization methods require user interaction to obtain scribbles in video sequences.

The second category of video colorization methods transfers' example colour information of the collared frame to other frames [5] and [6] transferred colour information to other monochrome frames based on luminance values and texture features of the pixels respectively [7] took colour information into the other frames in the video using a colour transfer technique with motion estimation. [8] utilized motion estimation calculated by [9] to transfer colour information of the whole reference frame to others [10] transferred colour information of pixels around corner feature points to neighbouring frames by pyramidal implementation of the [11] used a collared frame as a reference to colorize other frames based on a real-time patch matching algorithm called RIANN.

In order to apply the video colorization technique in the practical applications such as colour video compression, where only the first colour frame of a video sequence is preserved, it is obvious that there is no user interaction and the colorization results should be similar to the ground truth. However, the existing video colorization methods introduced above cannot satisfy the requirements in practical applications, since they cannot colorize monochrome frames to obtain the promising colourful video due to limited colour information of scribbles or artefacts caused by motion estimation and some of them even require user interaction. In this work, we propose an effective automatic video colorization method. We first use optical flow to estimate motion vectors for initial matching between the monochrome and collared reference frames. Then an effective colorization method is implemented based on matching results. Besides, we introduce a novel adaptive multi-frame reordering method to obtain the robust colorization results of the whole video sequence.

Voice verification is not based resting on voice recognition except on voice-to-print verification, where a composite tool transforms voice into text. Voice biometrics has the majority potential intended for development; because it requires no new hardware most PCs already contain a microphone. However, poor quality and ambient noise can affect verification. In calculation, the conscription method has often been more difficult than with additional biometrics, foremost to the observation that voice verification is not user friendly. Therefore, voice verification software needs enhancement. One day, voice may become an additive technology to finger-scan technologies.

III. MOTIVATION

Multimedia is effectively an infrastructure technology with widely different origins in computing, telecommunications, entertainment and publishing. New applications are emerging, not just in the wired environment, but also in the mobile one. At present, only low bit-rate data services are available to the mobile users. The radio environment is harsh, due to the many reflected waves and other effects. Using adaptive equalization techniques at the receiver could be the solution, but there are practical difficulties in operating this equalization in real-time at several Mb/s with compact, low-cost hardware.

Digital videos have become ubiquitous; already, more than 50% of both wire line and wireless data traffic is video data. Being able to monitor and control the perceptual quality of this traffic is a highly desirable goal that could be enabled by the development of 'completely blind' video quality analyzers that could be inserted into video networks or devices without any training or reference information Deviations from these regularities alter their visual impression. Quantifying measurements of regularity (or lack thereof) under a natural video statistic model makes it possible to develop a 'quality analyser' that can predict the visual quality of a distorted video without external knowledge of any kind beyond the underlying model of natural undistorted videos. This also raises the question of how many exemplar videos are needed to design an accurate natural video model and how diverse and distinctive these need to be relative to each other and to the world of videos. Finally, given current limitations of image/video camera capture, distortions are inevitably introduced in the acquisition process and hence the procurement of perfectly natural 'pristine' videos is practically impossible. In this article, 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 concept of image presents the visual representation and pictures that one person imagining about products and places and can be defined as the series of beliefs, individual impressions and opinions. Country image, destination image, country of origin image and product image are some of main concepts regarding image from the marketing perspective and those concepts are connected, closely related and they affected each other, directly and/or indirectly. Therefore it comes to disarray in the literature between those concepts and their definitions and very often they are mixed up.

Very early, since 1960s, country image become interesting topic to researches. Majority of those studies were focused on understanding country of origin image and its effects on product quality perception, as well as on purchase intention when it comes to tourist destination as product to be "purchased" within this concept there is lot of confusion and limited research. The same idea is definition, where country of origin concept is defined as "a marketing concept that captures consumer's difference attitudes towards different nations".

The speed of increasing internet usage, smart-phone usage and other tablets, laptops etc. influences on development of electronic word of mouth and the ways how people communicate. While looking for tourism destination, there are external and internal inputs as influencing factors on destination selection. "Online information search can be considered part of the external inputs – social stimuli.

Thus, it seems to be reasonable to test does social media photo and video sharing and social media word of mouth can moderate country image effect and does it influence intention to visit this destination.

IV. LITREATURE SURVEY

Colour quality is an important consideration, yet there are not currently any well-accepted models of perceptual quality prediction of colour images. However, pretty good results and some improvement relative to ''luminance only'' processing can be obtained by applying standard single-channel QA models to one or more chromatic channels, then combining these in various ways. However, progress remains to be made on this problem, given the complexities of colour perception and the lack of current models of colour distortion perception.

Assessing the quality of stereoscopic (3-D) images is also a topic of pressing interest. The main problem is geometry and visual comfort, which is difficult to ensure without a large Hollywood budget (and even then!). However, our topic here is the perception of distortions, and the role of depth on distortion perception remains quite murky, and like colour, no entirely successful method of stereo image quality assessment has been found. While several approaches have been proposed for 3-D stereoscopic QA 2-D quality models applied to stereo pairs commonly perform as well as, or better than, 3-DQA models that utilize depth or computed disparity maps.

In any case, as these diverse fields converge with mutual recognition of the importance of understanding, measuring, monitoring, and acting upon the quality of visual signals, principled approaches are certain to emerge whereby the effects of blindly measured quality degradations on visual tasks can be established. It is quite possible that within a few years, image and video quality ''agents'' will be pervasive and a normal element of switches, routers, wireless access points, cameras and other mobile devices, as well as displays. Agents such as these could interact over large-scale networks, enabling distributed control and optimization of visual quality as the traffic becomes increasingly congested [1].

Artificial neural network (NN) architectures have been recognized for a number of years as a powerful technology for solving real-world image processing problems. The prime reason of this particular issue is to display some recent achievement in solve image processing troubles and optimistically to encourage other image processing researchers to utilize this technology to solve their real-world problems. Finally, it is our hope that this special issue will increase the awareness of image processing researchers to the impact of the neural network-based algorithms. The paper by Phillips presents a face identification algorithm that automatically processes an unknown image by locating and identifying the face. His algorithm is based on designing a net of matching pursuit filters optimized for face detection and identification. For identification, the filters find features that differentiate among faces, whereas, for detection, the filters encode the similarities among faces. This algorithm has been evaluated on three sets of images. The first set was images from the FERET data base (a well-known benchmarking data set for face recognition). The second set was infrared and visible images of the same people. This demonstration was done to compare performance on infrared and visible images individually, and on fusing the results from both modalities. The third set was mugs hot data from a law enforcement application. The planned procedure uses appropriate statistical model for both the pixel and context images and construct the trouble in terms of model-histogram fitting and global uniformity category.

The quantification is achieved by probabilistic self-organizing mixtures and the segmentation by a probabilistic constraint relaxation network. Experimental results are presented for sequence of MRI brain scans. It is also shown that it can be applied to clinical problems such as those encountered in tissue segmentation and quantitative diagnosis [2].

This work is an extension of PEE based on 3D-PEH modification. The proposed data embedding is conducted by modifying 3D-PEH with an advisable reversible mapping. Our superiority over PEE [10], pair wise PEE [31] and some other state of the art works is experimentally verified, demonstrating the effectiveness of the high-dimensional histogram utilization in RDH.

In the future, instead of 3D-PEH, we will extend the proposed method to larger prediction-error group consist more prediction- errors. Moreover, other than the proposed one, we will try to design effective reversible mappings especially the content-adaptive ones for high-dimensional histogram based RDH. Incorporating the proposed embedding method with more advanced histogram generation methods [3]

In this paper, Different from existing AR based methods which employ predetermined reference configuration to predict pixel values; the proposed method considers the anisotropic pixel dependencies in natural images and adaptively chooses the optimal prediction context by utilizing the nonlocal redundancy to interpolate pixels. Furthermore, the multi planar constraint is applied to enhance the correlations within the estimation window by exploiting the self-similarity property of natural images. Similar patches are collected by the combination of patch-wise pixel values and the gradient information. And the inter-patch dependencies are adopted to improve the interpolation. The experimental results show that our method is effective in image interpolation and successfully decreases the artefacts nearby the sharp edges. a new AR model for image interpolation by incorporating context-awareness. The proposed context-aware image interpolation methods can obtain better AR parameters by adaptively selecting the reference pixels from a larger candidate set ranked by the correlation coefficient. It excludes some reference pixels that are irrelevant with prediction so as to reduce the noisy information. Meanwhile, it includes some closely related reference pixels that are ignored in traditional models due to their long distance from the centre pixel, increasing the model precision and stability. Also, we design the multi planar constraint to enhance the correlations within the estimation window, not only preserving more structural information from LR image, but also greatly reducing the ill-posed condition of normal equation when solving the least square problem of the objective function [4].

The wide range of applications has made face recognition both from still images and video sequences very important areas of research. Though significant efforts have gone into understanding the different sources of variations affecting the facial appearance, the accuracy of face recognition algorithms in completely uncontrolled scenarios is still far from satisfactory. In the Face Recognition Grand Challenge 2006 [21], it was observed that many algorithms perform almost flawlessly (verification rate of over 0.99 for FAR of 0.001) for images taken under controlled illumination, but the performance significantly deteriorates with uncontrolled query images (verification rate of around 0.8 for FAR of 0.001). Pose and illumination variations still remain one of the biggest challenges for face recognition. Most of the approaches which can handle non-canonical facial pose require manual labelling of several landmark locations in the face which is an impediment to realizing a completely automatic face recognition system. Another issue that needs to be addressed is robustness to low resolution images. Standard face recognition methods work well if the images or videos are of high quality, but usually fail when enough resolution is not available. Other than these variations, a lot of work is needed to handle the other sources of variations like expressions, make-up, aging, etc. Face recognition from video sequences is a relatively new research area as compared to still image based face recognition and there are many unaddressed issues. The large amount of data that is being collected from surveillance cameras requires efficient methods for acquiring, pre-processing and analysing these video streams. Also, much work needs to be done to optimally use the dynamic information present in the video sequence for recognition. Another area of current research is in generating secure face signatures, known as cancellable biometrics. Finally, ideas from studies on human perception of faces must be integrated in the design of algorithms for face recognition [5].

In this paper, a novel RRIQA-SR has been built for image super-resolution, since reduced-reference IQA is the most meaningful and practical IQA for this application. The visual quality of HR images is predicted by energy change and texture variation in HR images, which are computed based on the similarity between image patches of LR and HR image patches. The experimental results show that the proposed RRIQA-SR method can obtain better performance than other quality metrics, even some full-reference quality metrics.

In the future, we will investigate how to use the proposed RRIQA-SR to optimize image super-resolution algorithms [6].

In this study, we have proposed a new full-reference VQA metric for SCIs based on structural information. For textual regions in SCIs, we extract the structure features by using the gradient information for visual quality prediction of textual regions. For pictorial regions in SCIs, the luminance and structure features are computed by intensity and LBP information, respectively, for visual quality prediction of pictorial regions. The internal visual quality of SCIs is estimated by fusing these of textual and pictorial parts. In the future, we will further investigate how to fuse the visual quality scores of textual and pictorial regions to obtain more reasonable quality scores of SCIs [7].

In this article, we present analysis and prediction of the behaviour of multiple crowd sources in a mobile crowd-sourcing market. The crowd-sources adjust their prices paid to smart-phone users for sensed data. First, we use a dynamic game to formulate the behaviour of crowd sources. The Nash equilibrium can be achieved.

All crowd-sources cannot increase individual profit by ultimately changing their prices and the smart-phone users obtain the highest overall profit. Then, we extend the dynamic game to a repeated one. The crowd-sources may cooperate with each other to obtain the optimal overall profit, considering the long-term profit. However, the crowd-sources have incentive to deviate from the optimal price. We study the condition that the collusion will be maintained. Simulation results show that the mobile crowd-sourcing market will be in a stable state. Our model can be used in many practical scenarios, such as urban noise mapping, traffic mapping, and air quality mapping [8].

In this article, we have summarized recent advances that have taken place in the broad area of energy harvesting wireless communication networks. We have covered a variety of topics ranging from information-theoretic physical layer performance limits to scheduling policies and medium access control protocols, as well as the newly emerging paradigm of energy transfer and cooperation that occur in addition or simultaneous with information transfer for such networks. Models and results under a variety of network structures, those with single and multiple hops as well as small and large scale have been addressed. We have also presented models for total energy consumption. It is worth noting that energy harvesting wireless networks simultaneously present new theoretical challenges and those that stem from physical phenomena and practical concerns. As such, the area provides a rich set of possibilities for obtaining design insights from mathematical formulations which take practical considerations into account. These considerations include such physical properties as storage imperfections, consumption models, processing costs, as well as realistic modelling such as causal energy harvesting profiles. Additionally, the area of energy and information transfer provides exciting possibilities to further adapt the network operation and improve its performance.

The possible improvement therein is closely tied to the efficiency of energy transfer and hence to the device and circuit technologies, connecting the theory again to the real world. To this end, we conclude by stating that the future challenges for energy harvesting wireless networks lie not only in advancements in various layers of network design starting from signal processing and communications physical layer all the way to the networking layer, but also in embracing the truly interdisciplinary nature of the energy harvesting wireless networks integrating with the advances from circuits and devices that harvest and transfer energy [9].

In this study, we propose a new automatic video colorization method for video sequences. The optical flow estimation method is first adopted to initially match reference collared frames with monochrome frames which are to be colorized. Then we initialize monochrome frames and propagate colour to uncoloured regions. Furthermore, in order to avoid the artefacts from motion estimation and colour propagation, we design a multi-frame and adaptive reordering colorization method. Experimental results show that the proposed method cans obtain the effective results of video colorization [10].

Consider a new paradigm, the PV system, which is supported by a government or a company to provide ridesharing trip service in urban areas to replace the current buses, (private) cars and taxis, although there are many problems to be handled. As a ridesharing platform, the PV system is a new approach and is different from T-Share [23] for several reasons. *First*, the PV system is designed as a potentially widely used transportation system to replace cars, taxis, and buses in urban areas. T-Share is only used in taxi sharing.

Second, the aim of our scheduling algorithm is to provide dynamic low-cost ridesharing trips with service guarantee such as low detour.

However, the scheduling strategy of T-Share is: each passenger is served by the taxi with minimum increasing of distance. There is not trip service guarantee both in T-Share.

Third, PVs cooperate with each other to achieve better performance. For example, passengers can transfer among different PVs. However, in other ridesharing systems (e.g., T-Share and via), drivers compete with each other for more profit.

To reduce PVs' travel distance with preserving short waiting travel time, this paper defines the PVP problem. An optimal solution through MILP is proposed. Then PCI algorithm for PVP is proposed, and then a local optimization method is introduced for performance improvement. Its performance has been studied with large simulations. The proposed algorithm can be practical in the near future. Simulation results show that PCI has good performance, which can greatly reduce the number of vehicles, travel distance and trip time. The number of vehicles in the PV system can be greatly reduced compared with CV system. Therefore, traffic congestion is mitigated. More importantly, the transportation cost for society, as well as the cost for individuals, will be significantly reduced. In the PV system, if some passengers require too high comfort, e.g., the detour ratio is near to 0, the PV system may not provide such trip service since serving other passengers may cause some detour distance. Some other problems, e.g., pricing, safety, privacy, charging, and parking are very important issues yet will be studied in the future [11].

Some of the artefacts and problems associated with this implementation are going to be analysed and plausible solutions are going to be discussed. Halos around bright edges (seen in Figure 4a/4b), seem to be a product of the spatial de-noising and can be mitigated by use of better adaptive filtering. The assumption made in Section II.D is that the *PSF* is the same for all channels and throughout the imaging plane, is in most cases, untrue and causes many artefacts especially on 80% image heights and above (close to the edge and corner of the image plane) [12].

The objective of this work was to compress an image. As in many of the devices where the full size images cannot be viewed or are not supported so the compressed images are used. The image compression also helps to save memory, as the size of the compressed image is less than the actual size of the image. In this project we have taken several images, in which original images were converted into compressed images using the various compressing methods. Comparison of various algorithms has been done and it is found that the original image 'wpeppers.jpg' of size (150kb) is compressed into a compressed image of size (23.4kb) using the STW compression method [13].

In this paper, an adaptive sampling approach is proposed to relieve the site survey burden of fingerprint-based indoor localization. It cuts down the sampling budget by 71 percent for the high SNR case and 55 percent for the low SNR case while maintaining a similar localization error performance of widely used localization schemes (KNN, the kernel approach and SVM). The performance gain comes from the basic observation that the RF fingerprints are highly correlated across space and across access points and it is possible to adaptively locate more informative entries. Since RF fingerprint calibration is tubal-sampling, we used low tubal-rank tensors to model RF fingerprints instead of low CP-rank, and proposed an algorithm for reconstruct the fingerprint database which adaptively sampling a subset of the reference points and then performing tensor completion.

We show that the proposed scheme achieves near-optimal sampling complexity. Our results solve a major challenge of fingerprint-based indoor localization and we advocate its wide adoption in real-world systems [14].

Grand masters have accentuated light and shadows in a scene to portray objects and figures more prominently in paintings a style popularized in Renaissance called Chiaroscuro. In this paper, we propose the first computational model named LuCo to capture and quantify this effect, introducing a measure of lighting surprise. The Bayesian surprise value is first calculated based on a set of local observations of luminance patches. Precision matrices of a GMRF model for the prior and posterior distributions are estimated via sparse graph learning. Finally, a histogram of the acquired surprise map is constructed, and the computed parameter of the histogram is deemed the LuCo score. A large LuCo score thus means that luminance surprises are either very big or very small in a painting, reflecting the artist's intention to accentuate lighting contrast. Experimental results verify the effectiveness of our LuCo metric when compared to a gradient based method and saliency-based methods. In particular, our computed LuCo scores reflect different usages of lighting contrast in Chiaroscuro and Impressionism paintings, and capture the luminance contrast changes throughout Rembrandt's life.

Such measures as LuCo open possibilities towards preservation of artistic intentions during media delivery [15].

V. SYSTEM OVERVIEW

Finding an optimal allocation of tasks to distributed workers in order to minimize communication is an NP-hard problem in general [15]. As such, there is a wealth of research devoted to approximate algorithms for finding task allocations to minimize communication.

The distributed Halide compiler does not attempt to automatically determine distributed schedules. This follows the Halide philosophy in allowing the programmer to quickly try many different distributed schedules and empirically arrive at a high-performing distributed schedule.

Our approach of required region intersection is similar to their approach. However, because our code generation can take advantage of domain-specific information available in Halide programs (for example, stencil footprints), our system has additional information that allows our code generation to be much simpler. A more general approach like flow-out intersection flow-in could be used, but would add unnecessary complexity.

In Fig. 1, the ''channel'' is more than just the communication medium. Instead, it encapsulates all phases of image or video capture, processing, and display. The sensing step might use a camera of known characteristics or perhaps might be unknown, e.g., an image from a web search or a video from YouTube. Front–end processing might include source compression and encoding, artefact reduction, or format conversion. Digital communication might be as simple as storage into memory on a camera or transmission over a cable or wireless channel. This might include sophisticated error protection or error concealment protocols. Back–end processing might include decompression, correction of compression or transmission artefacts, or pre-processing for display.

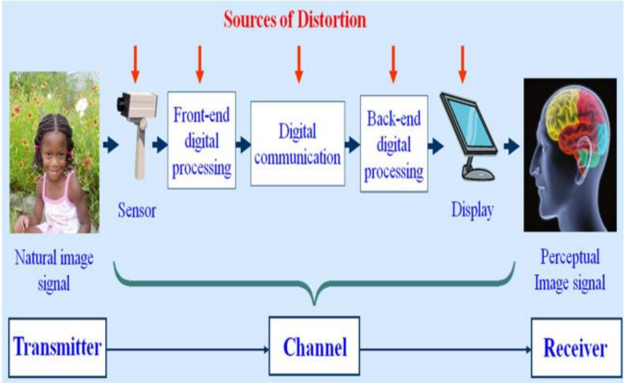


Fig.1 Predicting The Perceived, Subjective Quality Of A Natural Image Or Video That Has Been Artificially Acquired Processed Communication System.

The monitor could be a small form-factor (but nevertheless high-resolution) smart-phone display or a large-format HDTV. All of the above stages of capture, processing, and display are potential sources of signal distortion, as indicated by the red arrows in Fig.2. It may be argued that distortion also occurs in the ''transmitter,'' e.g., from light scattering, and in the ''receiver,'' e.g., from imperfect visual optics or neural noise. However, the ''channel,'' as depicted in Fig.2, defines those points in the flow where the visual signal is ordinarily digital and accessible by objective visual quality assessment algorithms.

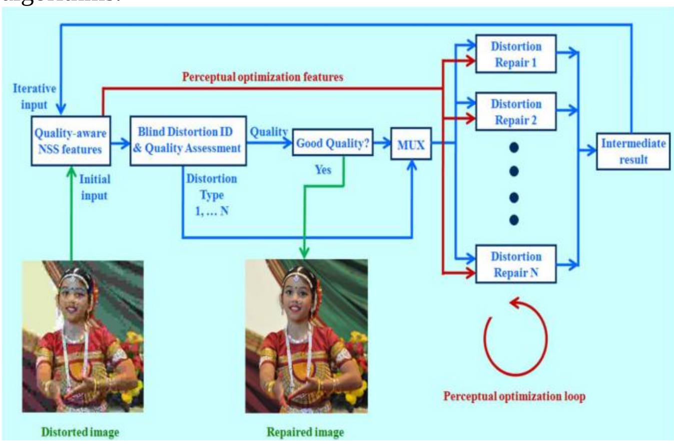


Fig. 2 General-Purpose Image Repair Model for (De-Noising, De-Blurring and De-Blocking.

This is relevant since, if a ''reference signal'' is to be used for comparison, then the earliest (and most usual) point at which it can be obtained is immediately post digitization, i.e., at the sensor. Conversely, the last point at which a ''test'' image or video may be digitally quality assessed is immediately prior to display. The signal quality can be measured at any or multiple points along the ''channel,'' revealing where quality is most affected. Of course, any of the above channel sub stages (aside from capture and display) may be omitted, or others added, depending on what actually occurs between acquisition and viewing of the visual signal. Next, we will start by discussing relevant and commonly used models for the essential transmitter (natural scenes) and receiver [human visual system (HVS)], followed by an overview of distortion models.

VI. PROPOSED METHOD

- **ENERGY E-HARVESTING**

A video sequence *V*, its collared part is denoted as Λ, and the monochrome part is denoted as Φ = *V* −Λ as shown in Fig.1. Instead of colorizing frames in sequential order, we iteratively calculate the similarity distance between the collared reference frame and monochrome frames, in order to choose a candidate frame to be colorized and simultaneously select the reference frames of it. Since only the 1st frame has colour information at first, there is only one frame (*i.e.* the 1*st* frame) in Λ. As the colorization process proceeds, more colorized frames will be added to Λ. The proposed method is designed in the *Y CbCr* colour space.

Let *Y***p** and**Cp** = (*Cb***p**, *Cr***p**) denote the luminance and chrominance vector of pixel **p**(*x*, *y*), respectively.

Optical Flow Estimation

In order to make good use of the spatial similarity of the video sequence, we utilize a state-of-the-art semi-dense optical flow method [12] to estimate the motion vector field between video frames based on their grey information.

Given the reference frame **R** and the target frame **I**, discrete labels *l***r** ∈ *{*1*. . . L}* representing the pixel motion between **R** and **I** are obtained by minimizing the following energy function,

$$E(\mathbf{L}) = \lambda \sum_{\mathbf{r}\in\mathbf{R}} \varphi_{\mathbf{r}}(l_{\mathbf{r}}) + \sum_{\mathbf{r}\sim\mathbf{r}'} \psi_{\mathbf{r},\mathbf{r}'}(l_{\mathbf{r}}, l_{\mathbf{r}'}),$$

where **L** = *{l***r**|**r** ∈ *R}* represents the set of labels associated to pixels in frame **R**. **r** ∼ **r**_ indicates that **r** and **r**_ are neighbouring pixels in the four-connected neighbours position. *ϕ***r**(*l***r**) is a data term measuring data fidelity based labels associated to the pixels and *ψ***r**,**r**_ (*l***r**, *l***r**_) is the smooth term for smooth flow fields. *λ* is a weighting parameter to determine the relative importance of these two terms.

Inter-Frame Colour Propagation

According to the optical flow estimation results computed in this section we can match most pixels of the reference frame **R** to pixels in the target frame **I**. For colorizing the monochrome frame, we first initialize the monochrome frame based on matching results. Assuming that Γ is the set of collared reference frames, which includes frame **R**. For each pixel **r** ∈ Γ, its matched pixel in the monochrome frame **I** is defined as *φ*(**r**, *l***r**), where *l***r** is the motion label of **r**. Then for each pixel **p** in frame **I**, its accuracy *a*0 **p** is initialized as:

$$a_{\mathbf{p}}^{0} = \begin{cases} \frac{1}{|\Delta_{\mathbf{p}}|} \cdot \sum\limits_{\mathbf{r}\in\Delta_{\mathbf{p}}} e^{-|Y_{\mathbf{r}}-Y_{\mathbf{p}}|}, & |\Delta_{\mathbf{p}}| \neq 0, \\ 0, & |\Delta_{\mathbf{p}}| = 0, \end{cases}$$

Where the set Δ**p** is denoted as *{***r** ∈ Γ|*φ*(**r**, *l***r**) = **p***}* and |Δ**p**| represents the number of pixels in it, and *Y***r**, *Y***p** are luminance value at the pixel **r** and **p**. We initialize the accuracy based on luminance differences so that it can be more robust to matching errors.

Then, the colour of **p** is calculated by,

$$\mathbf{C}_{\mathbf{p}}^{0} = \begin{cases} \frac{\sum\limits_{\mathbf{r}\in\Delta_{\mathbf{p}}} \mathbf{C}_{\mathbf{r}} \cdot e^{-|Y_{\mathbf{r}}-Y_{\mathbf{p}}|}}{\sum\limits_{\mathbf{r}\in\Delta_{\mathbf{p}}} e^{-|Y_{\mathbf{r}}-Y_{\mathbf{p}}|}}, & |\Delta_{\mathbf{p}}| \neq 0, \\ 0, & |\Delta_{\mathbf{p}}| = 0. \end{cases}$$

Here, **C**0 **p** = **Cr**, when there is one single reference frame matched with frame **I**.

After the initialization, we update accuracies and colour iteratively, in the *kth* iteration, if *ak*−1 **p** = 0, we update the accuracy of **p** by the colour pixels in its 4-connect neighbours:

$$\pi = \sum_{\mathbf{q}\sim\mathbf{p}} e^{-|Y_{\mathbf{p}}-Y_{\mathbf{q}}|}, \ \mathbf{q} \in \Omega.$$

By updating accuracies in this way, the weight of a collared pixel in neighbouring pixels decreases with luminance differences, which makes our colour propagation method robust. Utilizing accuracies obtained above as the weights, we update the colour of **p** by,

$$\mathbf{C}_{\mathbf{p}}^{k} = \frac{\sum\limits_{\mathbf{q}\sim\mathbf{p}} \mathbf{C}_{\mathbf{q}}^{k-1} \cdot a_{\mathbf{q}}^{k-1} \cdot e^{-|Y_{\mathbf{q}}-Y_{\mathbf{p}}|}}{\sum\limits_{\mathbf{q}\sim\mathbf{p}} a_{\mathbf{q}}^{k-1} \cdot e^{-|Y_{\mathbf{q}}-Y_{\mathbf{p}}|}}, \ \mathbf{q} \in \Omega.$$

For the pixel **q**, which has already been colorized, *ak* **q** = *ak*−1 **q** and **C***k* **q** = **C***k*−1 **q** . Following the method proposed above, we propagate colour information iteratively in the frame **I** until all of the pixels are collared.

Multi-Frame and Adaptive Reordering Colorization Refinement

In this section a simple and direct way to colorize a set of video frames is to propagate colour information among frames in-order between adjacent frames. However, this simple method might bring into artefacts. Since there is certain error for motion estimation by optical flow, the colorization would propagate the error within following video frames. To avoid these artefacts, we further improve the video colorization process by refining the multi-frame prediction and colorizing order.

First, we increase the number of reference frames which are chosen form colour frames set Λ to make colour propagation more robust. Once obtained more colour frames, we could add them into the reference set Γ described. That is, multi-frames are utilized into predicting the motion estimation and refining the process of inter-frame colour propagation.

Then, in general, more similar and small motion between two video frames, the error made by optical flow estimation and colour propagation is less. Along this way, we calculate the similarity distance among frames in order to refine the order of the video frames to be colorized.

Let *ρ*(**S**, **T**) be the distance between frames **S** and **T**, *m* (**s**,**T**) is the length of the motion vector of pixel **s** in **S** to **T**. | · | represents the number of the set.

Then, we set

$$\rho(\mathbf{S}, \mathbf{T}) = \frac{\sum_{s\in\mathbf{S}} m(\mathbf{s}, \mathbf{T})}{|\mathbf{S}|},$$

And choose the frame to be colorized by optimally solving:

$$\xi(\mathbf{S}) = \frac{1}{|\Lambda|} \cdot \sum_{\mathbf{R}\in\Lambda} \rho(\mathbf{S}, \mathbf{R}),$$

$$\delta(\mathbf{S}) = \frac{1}{|\Phi|} \cdot \sum_{\mathbf{I}\in\Phi} \rho(\mathbf{S}, \mathbf{I}),$$

Where α is a weighting parameter for relative importance for these two terms. After choosing the frame ˆ**S**, we add its two nearest frames in Λ into the reference set Γ.

$$\hat{\mathbf{S}} = \arg\min_{\mathbf{S}} \left\{ \xi(\mathbf{S}) - \alpha \cdot \delta(\mathbf{S}) \right\},$$

Last eq. guarantees that we can colorize a frame earlier, if it is more similar to colour frames and more different from other uncoloured frames. Fig.3 illustrates the different reordering for different sequences colorization. It leads to reducing the error propagation to latter processed frames.

VII. SIMULATION AND RESULTS

- **PARAMETERS USED**

Image data is characteristically of an elevated bandwidth. Distinctive raw PAL TV signal determinations require 20 MB/sec used for broadcast. A single Digital movie format frame is 7MB large. The mission of image compression is to decrease the amount of data used to store up an image exclusive of objectionable degradation in the perceived quality of the image. The term objectionable depends of course on the use of the image data. Sometimes fast/real time transmission is more important than image quality e.g. video over wireless. Other times quality is paramount as in Digital Cinema and DTV. To make matters more complicated the same image shown in different formats looks quite different e.g. while single convert on or after one DTV system to a further, degradations in the conversion do not demonstrate up on television sets, but if the same image is used for creating a Digital Cinema production [film format ads created from TV ads] then the degradations are very noticeable The numerical values used for these intensities are usually chosen such that equal increments in value result in approximately equal apparent increases in brightness.

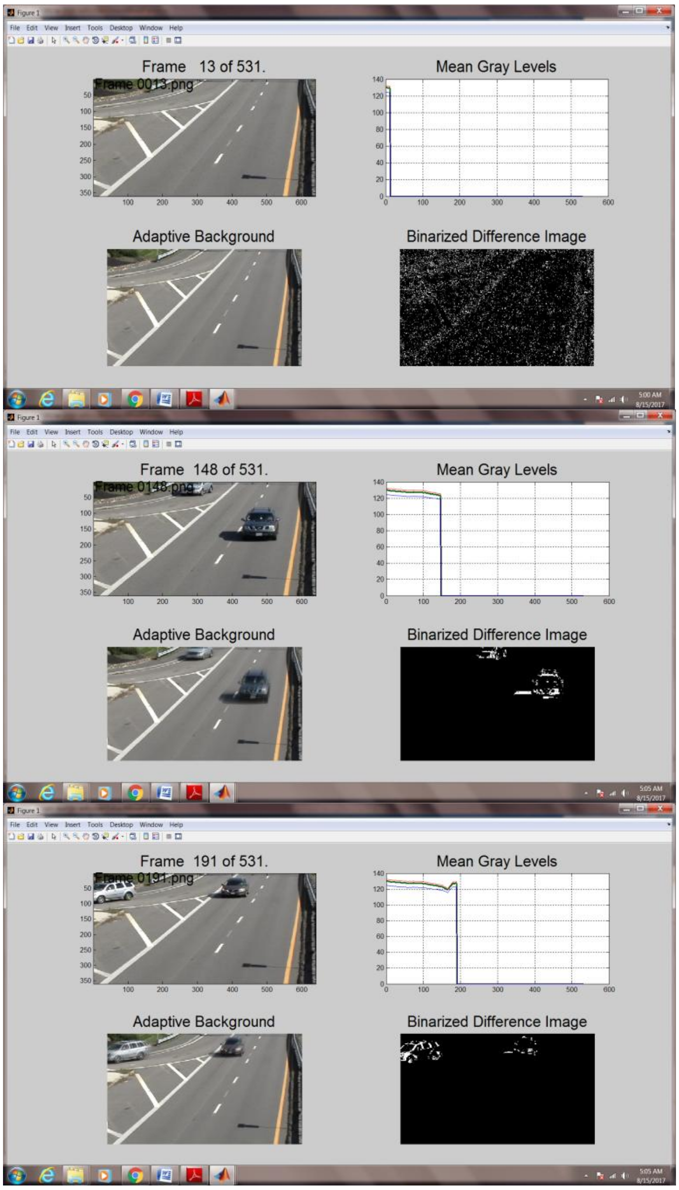
Our video colorization method is tested in two ways. One is to use frames randomly selected from some standard video sequences as references to colour their next frames in the sequences. Another way is to use one selected frame as a reference and colorize the following few frames. PSNR is computed for objective quality evaluation by our colorization method.

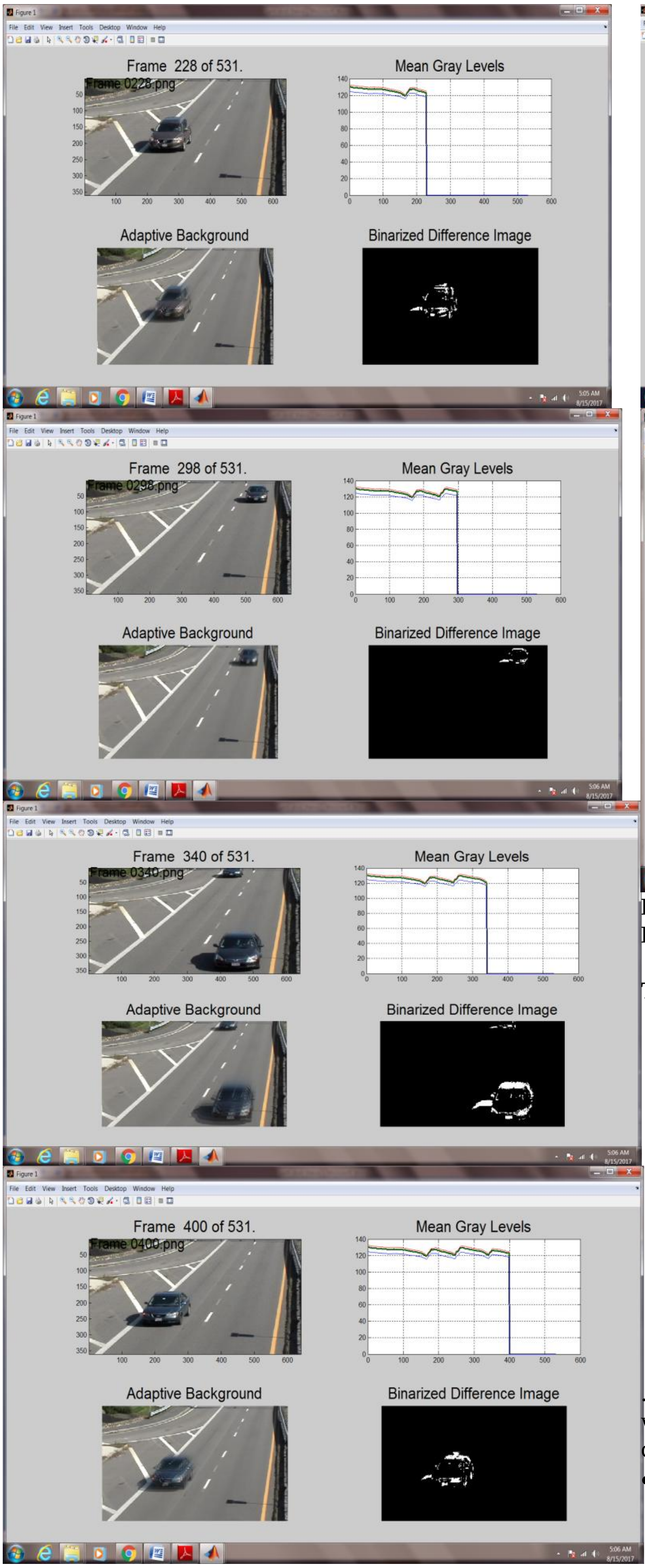
Digital video data is represented as three separate component data streams: RGB or YUV. For the reason that of the instinctively slight sensitivity of humans to colour, colour information is usually sampled at a minor rate than the intensity information. When the colour information is down sampled by a factor of 2 horizontally from the full resolution intensity image, the picture sampling structure.

In the experiment, we set α = 1(for frame to be colorized by optimally).

In practice this means that the numerical value is approximately proportional to the log of the true light intensity (energy of the wave). This is another statement of Weber's law. Those mathematical standards will be referred to as intensities in the respite of the itinerary as it is suitable to refer to an intuitively linear scale.

- **RESULTS OF VIDEO FRAME BY FRAME**





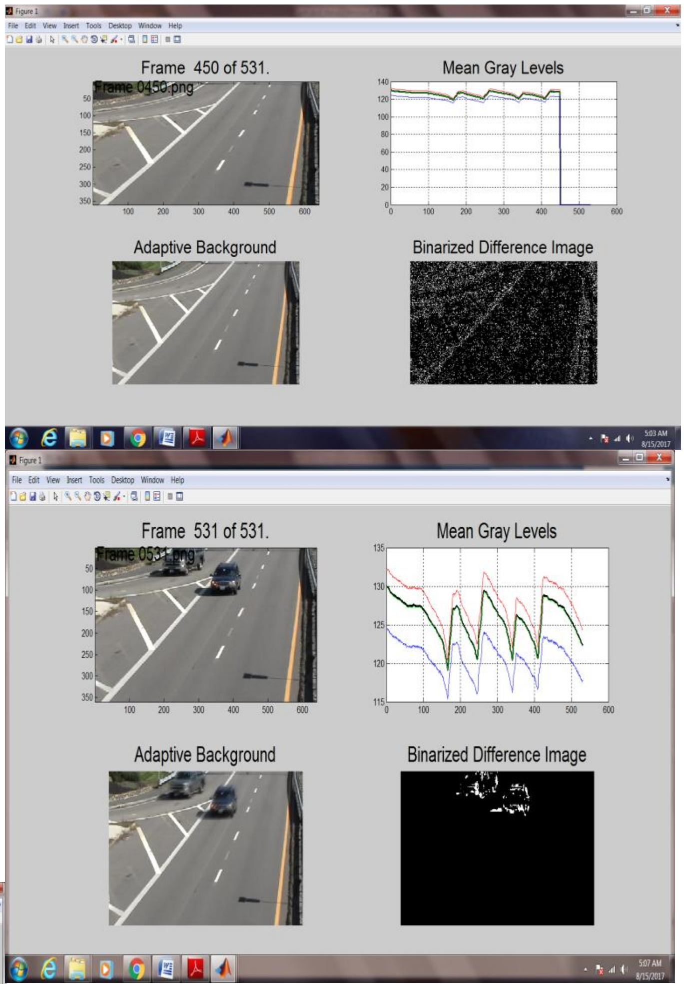


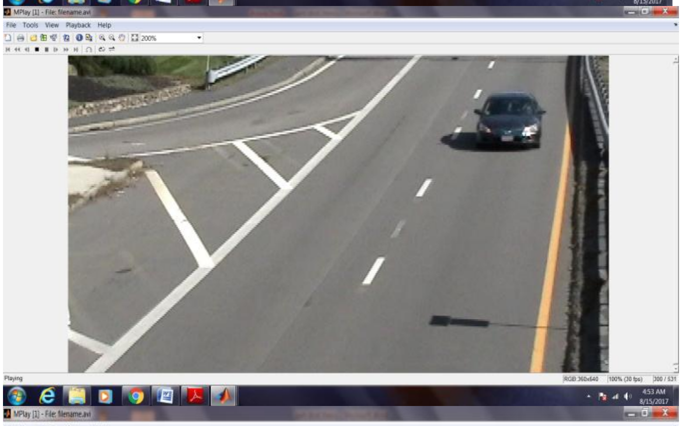
Fig.3 Actual and Working Frame with Binarized Difference Frame at Mean Gray Levels of PSNR

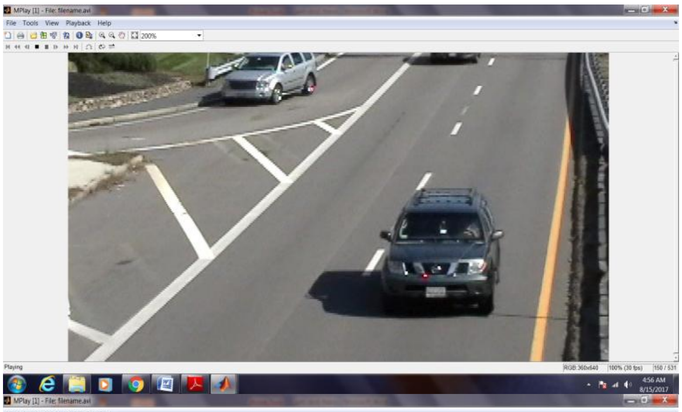
Table.1 PSNR (dB) Comparison of Colorization Results

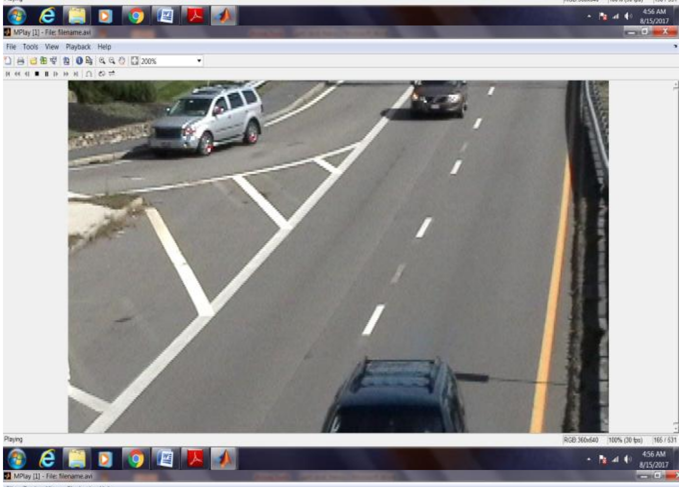
No. of Frame	**RGB PSNR in db (approx.)**			**MEAN GRAY** LEVELS PSNR (dB)
	R	**B**	**G**	
13	135	130	125	130
148	130	125	120	125
191	135	132	122	132
228	132	128	120	128
298	124	130	134	130
340	122	120	118	120
400	130	125	120	125
450	134	128	124	128
531	130	128	118	128

.We take number of frame randomly where object found and we found that the PSNR is too high and it is good for our colorization result.

- **Concluding Multi Frame with Same Object of Colorization**







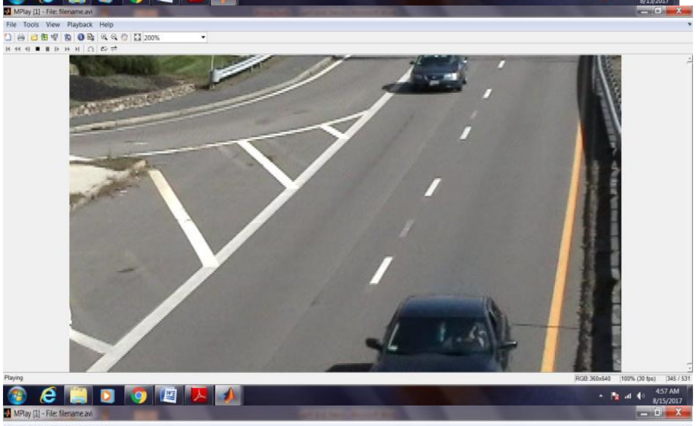


Fig.4 Concluding Multi Frame with Same Object of Colorization

Original information determined by our technique are shown in Fig. 3,4 from these figures, distinguish that the proposed modification results do better and great, it also demonstrate that the proposed technique can acquire give better concert in video colorization scheme.

VIII. CONCLUSION AND FUTURE SCOPE

- ### CONCLUSION

Unfortunately, these error measures don't align well with the Human perception of pictures. It’s an honest rule of thumb but that in comparison pictures victimization these measures, massive variations in objective measurements do tend to imply similar variations in human perception of the photographs. But once the variations between an equivalent objectives live on many pictures square measure little then it's not the case that the variations would imply similar sensory activity evaluations. An illustration throughout the lecture can justify this additional clearly. Victimization this technique, human subjects square measure asked to rank ascertained (processed) pictures in terms of this five purpose scale. Collating results from such experiments provides some quantitative measure of the subjective perception of the photographs.

In this study, we have a tendency to propose a brand new automatic video colorization method for video sequences. The optical flow estimation method is 1st adapted to at first match reference colour frames with monochrome frames that square measure to be colorized.

Then we have a tendency to initialize monochrome frames and propagate colour to uncoloured regions. What is more, so as to avoid the artefacts from motion estimation and colour propagation, we have a tendency to style a multi frame and accommodative rearrangement colorization technique. Experimental results show that the projected technique will get the effective results of video colorization.

In any case, as these numerous fields converge with mutual recognition of the importance of understanding, measuring, monitoring, and acting upon the standard of visual signals, principled approaches square measure guaranteed to emerge whereby the consequences of blindly measured quality degradations on visual tasks may be established.

It is quite attainable that among a couple of years, image and video quality ‘‘agents’’ are pervasive and a standard element of switches, routers, wireless access points, cameras and different mobile devices, still as displays.

Agents like these might move over large-scale networks, distributed management and optimization of visual quality because the traffic becomes more and more congested.

The big selection of applications has created face recognition each from still pictures and video sequences terribly important areas of analysis. Though' vital efforts have gone into understanding the various sources of variations poignant the facial look, the accuracy of face recognition algorithms in fully uncontrolled scenarios continues to be removed from satisfactory.

- **FUTURE WORK**

Create and illumination variations still stay one of the largest challenges for face recognition. Most of the approaches which may handle non-canonical facial create need manual labelling of many landmark locations within the face that is AN impediment to realizing a completely automatic face recognition system. Another issue that must be addressed is strength to low resolution pictures. Common place face recognition ways work well if the photographs or videos square measure of high quality, however sometimes fail once enough resolution isn't accessible. Apart from these variations, lots of labour is needed to handle the opposite sources of variations like expressions, make-up, aging, etc.

Face recognition from video sequences may be a comparatively new analysis space as compared to still image based mostly face recognition and there are several unaddressed problems. The massive quantity of knowledge that's being collected from police investigation cameras requires economical ways for exploit, pre-processing and analysing these video streams. Also, much work needs to be done to optimally use the dynamic info gift within the video sequence for recognition.

The brightness level and structure options are computed by intensity and LBP data, severally, for visual quality prediction of pictorial regions. The internal visual quality of SCIs is calculable by fusing these of matter and pictorial components. Within the future, we are going to any investigate the way to fuse the visual quality uncountable matter and pictorial regions to obtain additional cheap quality uncountable SCIs.

Use a dynamic game to formulate the behaviour of crowd sources. The equilibrium is achieved. All crowd sources cannot increase individual profit by ultimately dynamic their costs and the smart-phone users acquire the very best overall profit. Then, we tend to extend the dynamic game to a repeated one. The crowd-sources could work with one another to get the best overall profit, considering the long profit.

Our model is used in several sensible situations, like urban noise mapping, traffic mapping, and air quality mapping. The capturing of Omni-directional pictures is full of lighting conditions, resolution of the camera sensing element, mirror profile, vibrations, etc. This work contributed to beat some of these issues. The planned ways square measure principally cantered to afford reworked pictures without any vital distortion. One in every of the foremost vital sources of those distortions is caused by the vibrations. The planned stabilization rule works with sub-pixel accuracy and high speed for the parameter estimation, that square measure necessary for proper image transformation utilized in time period applications. The verification of planned ways wasn't done solely through an experiment by victimization analysis of trailing ways on pre-processed position images however additionally utilized in applications. Behaviour of the trailing ways was evaluated on varied forms of captured knowledge. The no inheritable knowledge set contains many video sources from both: perspective cameras and Omni-directional system. These tests show that the wide pictures no inheritable from extreme systems are used for act monitoring with nearly a similar effectiveness as from perspective cameras.

Many pc applications advantages from this advantage and therefore it might be fascinating to focus the analysis into this space. Lots of issues relevant to the position vision still exist. These issues signal the means of the continuation the long run work. One in every of them is that the lighting that affects the system from totally different sides. The lighting claims to influence analysis of the various conditions and also the ways of modifications that square measure susceptible to lighting conditions are advised. One of the interesting areas is that the colouring analysis for flesh components detection. This feature is affected by {different totally different completely different} lighting conditions from different lightning sources, that have an effect on the Omni-directional system way more than classical cameras with slender field of read. The variety of mirror profiles offers the new space of the system styles with specific requirements on the sector of read and quality of the image components. These properties need modifications of existing ways for image process so as to attain appropriate results.

Mirrors with non-central viewpoint square measure used due to their specific properties. On the opposite hand, since they need non-central viewpoint, specific demands to style ways for proper Image formation or 3D purpose determination would be needed.

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