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# *Some Study On Video in-paint using Image Processing Approach*

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***Abstract***

*This paper presents basics of image processing approach and study of different image processing methods for painting still images and how this is useful to improve image resolution for both still as well as video images. This paper also presents how to improve the low resolution image patch with high resolution image patch. It also includes how one can erase unwanted title, name or translated language displays in video images by painting its pixels with desired color. This paper also describes basic building blocks of image processing sequence and image compression methods.*

***Keywords:*** *—Image, Digital image, Image Processing Sequence, Image Compression, Video in-paint, Samples, Object recognition, Recognition of action, Object tracking, Depth image.*

## INTRODUCTION

This paper presents a study on different image processing techniques for still images and how it can be applied for video image processing, as video clip contains consecutive sequences of video frames and one frame contains collection of consecutive sequences of images. This paper specially focuses on how image processing approach will be useful in video-in painting, for removing unwanted name, title or language translation display in video clips or movie clips. The next section describes the study of different existing methodologies explained as a study of different papers.

## HISTORY

The paper [1],suggests a single image super resolution approach using sparse signal representation. It also suggests [1],by using image statistical information


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one can represent image patches as a sparse linear combination of elements with the help of appropriate use of image dictionary. Paper[1] also suggests that ,in a sparse representation of image for each low resolution image input patch, use the coefficient of sparse representation to get the high resolution output.

The paper[2], suggests how image can get shapes from pixels? It also suggests how continuous-domain visual signals are captured in the form of discrete digital images. Actually, this operation is invertible unless continuous domain signal satisfy the constraints like limited bandwidth. This paper[2] also tells us the different problems of recovering image shapes from set of samples. This paper [2], also suggests how they formulated the reconstruction technique by using minimum shape perimeter over the set of consistent binary image shapes. It has also introduced the requirement which guarantees equivalence between the two different problems.

This paper [3], suggests how the discriminative model is becoming more favorable due to its excellent denoising performance. It [3] also demonstrate that their DnCNN model exhibit high effectiveness in image denoising tasks and also it is effectively implemented using GPU computing.

This paper [4], mainly focuses on problem of online Tracking of objects and their classification in a particular image sequence. Their [4] proposed solution also tells, it can track multiple objects in a scene without prior knowledge of objects. It [4] also tells how tracked objects can be classified by using one of the fastest learning Image Classifier.

This paper[5], suggests a framework which can summarise collection of videos instead of single video. They have used diversy aware sparse optimization method for multi-video summarization. This method [5] also useful to retrieve information about particular video from collection of summarized videos. They [5] have also developed alternating minimization algorithm for solving optimization problem more efficiently. This paper also tells about different experiments conducted on 140 videos for multi video summarization purpose.

This paper [6] focuses on recognition of action using 3D Texture Histograms and different boosting classifier. This paper[6] suggests one of low cost 3D descriptor histograms of texture which can extract


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discrimant features from depth maps. In this technique 3D histogram textures are obtained from projecting different depth frames onto 3 orthogonal Cartesian planes, i.e. plane having frontal, side, top planes which provides combinely salient and accurate information of action. Apart from this, paper [6], has proposed multiclass Boosting classifier for classification of object actions.

**BASICS OF VIDEO IMAGE PROCESSING**

a) ***Digital:*** Data represented in the form of numbers or digits, which is obtained from some discrete signals. Discrete signals can be obtained from original analog signal.

b) ***Image***: An image can be defined as arrays of pixels or it is M*N matrix having 'M' number of rows and 'N' number of columns. For grayscale image pixel can be represented in terms of pixel reflectivity R(X,Y) and pixel intensity I(X,Y).It can be represented in the form of equation as:
$P(X,Y) = R(X,Y) * I(X,Y)$

Where, P(X,Y)= Pth image pixel having (X,Y) coordinates of that pixel in M*N image. Image also can be defined in terms of two dimensional function F(X,Y).

c) ***Processing:*** Processing is nothing but to perform certain operations on data(here image data) according to particular algorithm or program.

d) ***Digital Image Processing:*** It can be defined as, to perform image processing operations on digital images using some computer algorithms.

e) ***Digital Image****:* Digital image having finite set of elements called as pels, image elements, pixels or picture elements.

f) ***Digital Image Processing Sequence:*** In case of video image display, it is sequence of continuous images which are displayed in the form of certain number of image frames per second and one frame contain collection of images to represent particular movie scene. If number of frames displayed at specified minimum requirement, then we will get continuous illusion of movie pictures.


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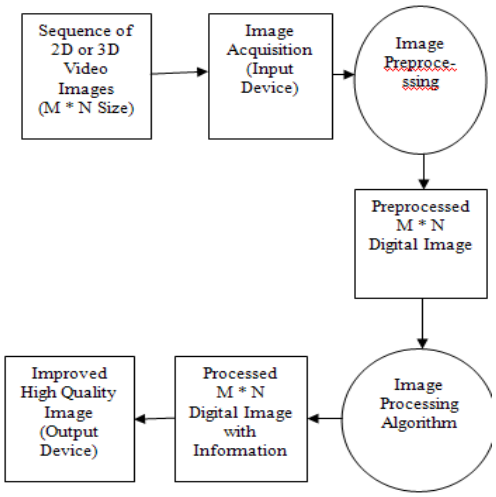



***Fig.1.1 Basic Image Processing Sequence***

g) ***Input device:*** It can be high Quality (High resolution Camera) or image sensor, which captures or feed image as input to the system.

h) ***Preprocessing:*** In preprocessing phase different operations are carried out over input image, such as image enhancement, noise removal, noise filtration etc.

i) ***Image Processing Algorithms:*** Image processing algorithm used to process the input digital image in order to improve the image quality or change its particular pixel parameter values. E.g. Color to grayscale conversion, Increase or decrease brightness and contrast of image.

## IMAGE COMPRESSION

Image Compression is nothing but reducing amount of data required to represent given digital image. In image compression generally redundant image data is removed.

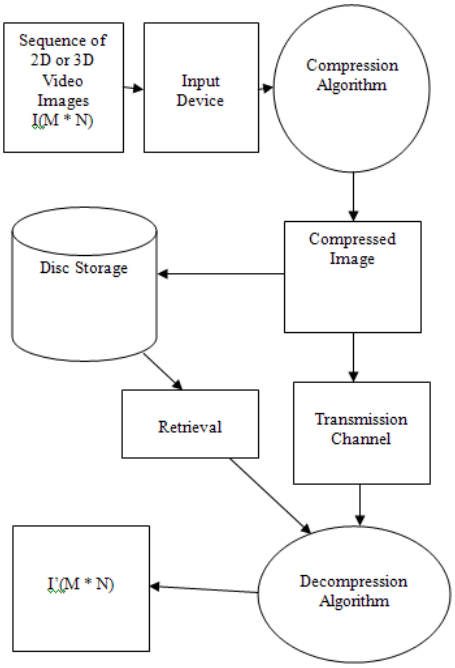



***Fig.1.2 Block schematic of Image Compression Sequence***

It is useful as far as storage space on disc is concerned and transmission over small bandwidth channel is concerned. Compressed image would require less storage space on disc as well as it would require less bandwidth for transmission over communication channel.

**(A) Image Compression Process:** In case of block diagram shown in Fig 1.2, I(M * N) is the original input image which is compressed using standard image


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compression algorithm (Lossy or Lossless) and compressed image is either stored on storage device or transmitted over low bandwidth communication channel. At receiving end the compressed image can be obtained in its original form by decompressing it, by using standard decompression (reconstruction) algorithm, i.e. I'(M * N).

Where, M= Number of rows of image pixels and

N= Number of columns of pixels in original image.

**(B) Image Compression Methods:**

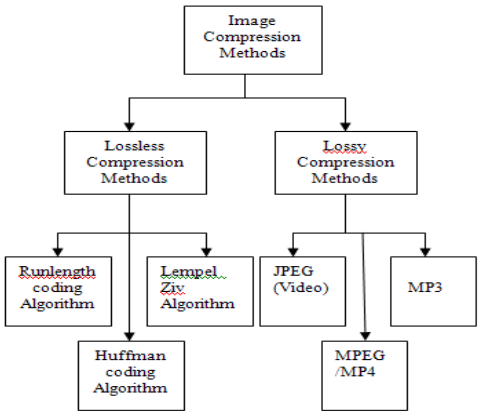



***Fig.1.3 Classification of Image Compression Methods***

***(a) Lossless Compression Algorithm:***

In case of compressed Image obtained after decompression is same as original Image Without Loss Of data. Examples of lossless compression Algorithms are Huffman Coding Algorithm, Run length coding algorithm, Lempel Ziv Algorithm etc.

$$E(X,Y) = P'(X,Y) - P(X,Y) = 0$$

Where E(X,Y) = Error or Loss of data

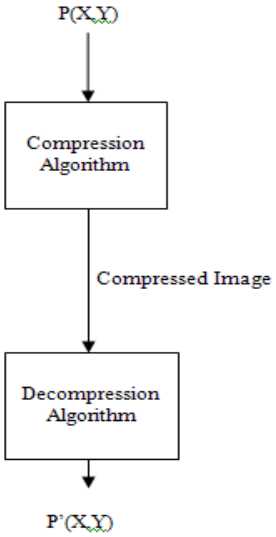



***Fig.1.4 Lossless Compression Process***

***(b) Lossy Compression Algorithm:***

In this algorithm, image obtained after decompression has considerable amount of data loss. In this case data loss E(X,Y) is definitely greater than zero.

$$E(X,Y) = P'(X,Y) - P(X,Y) > 0$$

**CONCLUSION**

Thus, in this Paper we have studied different Image Processing techniques which are useful in video in-paint using image processing approach. Thus after in-depth study of different image processing approach like image painting, which would be very useful for developing efficient and high performance video in-


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paint algorithm.Also,this paper focuses on basics of image processing sequence, image compression methods like lossy and lossless compression.

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