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Image and Improve Its Resolution Using Digital Image Processing

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***Abstract* - Digital image processing refers to processing of a two dimensional picture by digital computer. Digital image processing is the use of computer algorithms to perform image processing on digital images. Digital signal processing has digital image analysis, Independent component analysis, Hidden Markov models. The hardware based systems are unable to work under electromagnetic noise and produce a high resolution image. To overcome the problem the software digital system is constructed with features such as reconfigurability, linearity and low noise. This software digital system is able to operate in presence of disturbances and processing over analog allows a many advantages It of image much processing. Wider range algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing. Some techniques which are used in digital image processing include: Pixilation, Linear filtering, Principal components electromagnetic noise. This system captures the image and process the image by filtering the noise and distortions in it. Finally the original image is reconstructed.**

Keywords: software digital system, image.

I. INTRODUCTION

The main objective of the project is to reconstruct the captured image by filtering out the noise and distortions. It can be achieved using software digital system. Capture an image to which the high resolution has to be attained. Two similar images are synchronized based on their pixel values. The synchronization of image is done by comparing the similar pixel values. The synchronized image is preprocessed by generating frames. Size of the frame can be given according to the user criteria. The preprocessed image is filtered by discharging the noise and distortions. Discharging of noise and distortion is implemented using the data mining algorithms such as k-mean and classification algorithm. The frames are refined by which the frames are validated based on the minimum and maximum threshold value. In such validated frames the energy value is calculated with each frame having the maximum number of pixels. Such validated frames are selected in order to reconstruct the image. The reconstructed image will have high spatial resolution without any noise distortions.

II. RELATED WORKS

In [1] author describes the construction of HICAM gamma distortions. Camera to capture the image. The hardware that consists of A to D converter signals to for converting signals, analog Field digital Programmable Gate Array is used to process the input signals, Communication board is used to transform the images from the HICAM gamma camera to processing system. The 2D image is reconstructed either in tomography mode or scintigraphy mode. Finally the image is reconstructed using the reconstruction software. The image is reconstructed using the reconstruction software. The image is reconstructed by consolidating the frames. The frames with high threshold value are considered as validated a frame which is observed from silicon drift classification algorithm. The frames are refined by which the frames are validated based on the minimum and maximum threshold value. In such validated frames the energy value is calculated with each frame having the maximum number of pixels. Such detectors. From the calibration of single SDD the gain value is calculated using the offset value and co peak value.

DH has one more advantage in space applications, namely its image data reduction feature. Indeed, it enables to re-construct on ground many sample planes from one singleimage taken in orbit, reducing therefore significantly the amount of data to be down linked from the FSL/ISS to the ground for telescience, or to be recorded for later quantitative evaluation on ground. The downlink data rate is indeed very The emergence of new easy, fast and reliable techniques of image storage and Internet transmission has stirred up the practice of medicine. For example, patients could get immediate diagnosis of any specialist located anywhere [10]. In classical image encoding systems, the last compression operation consists in entropy coding, generally based on variable length codes. If the coding process produces a single bit stream, as soon as one bit is lost during the transmission of encoded data, the whole image is then lost. For this reason, progressive transmission of information constitutes a key issue in the domain of telemedicine and teleastronomy.

III. PROPOSED WORK

Spatially invariant implies that the blur is independent of position. That is the blurred object will look the same regardless of its position in the image. Spatially variant implies that the blur depends on position. That is an object in

an observed image may look different if its position is changed. If we assume that the blur is spatially invariant then the PSF is represented by the image of a single point source. In this case, the structure of H depends on the boundary condition. Images are shown only in a finite region, but points near the boundary of a blurred image are likely to have been affected by information outside the field of view. Since this information is not available, for computational purposes, we need to make some assumption about the boundary conditions. Periodic boundary conditions imply that the image repeats itself endlessly in all directions; periodic boundary conditions imply that H is a block circulant matrix with circulant blocks (BCCB).

Proposed Blind Super Resolution Restoration using DCT:

Images are obtained in areas ranging from everyday photography, astronomy, remote sensing, medical imaging, microscopy and many more. In each of mere cases there is an underlying object or scene we wish to observe. The original image or the true image is the ideal representation of the observed scene. Yet the observation process is never perfect, there is uncertainty in the measurement occurring as blur, noise and other degradations in the recorded images. Image restoration aims to recover an estimate of the original image from the degraded observations. Classical image restoration seeks an estimate of the true image assuming the blur is known, whereas blind image restoration tackles the much more difficult but realistic problem where the degradations are unknown. The low resolution observation model of Eq. (2) is considered. We formally state by casting the problem in multi channel restoration format, the noise is AWGN and the blur is considered as between channels and within channel of the low resolution images.

The low resolution observation model of Eq. 2 is considered. In this paper we propose a novel progressive image compression algorithm for super resolution reconstruction using DCT. At the encoder the images have to be compressed before transmission. A 2D DCT is applied for each low resolution image whose size is chosen as 256x256.The low resolution images are divided into sub image of size 8x8, with a total of 32 non overlapping blocks. DCT is applied on each 8x8 blocks producing one DC coefficient and AC coefficients. In order to remove the noise which is present during acquisition, we encode each Block DCT image by applying the zonal filters to the low frequency components and discard the high frequency components, which results in denoised image. Once the images have been deblurred and denoised. The images are fused using maximum frequency fusion to obtain a single image.

IV. ALGORITHM

At the encoder:

Step 1: Three input low resolution blurred, noisy, under sampled, rotated, shifted images are considered.

Step 2: The images are first preprocessed, i.e. registered using FFT based algorithm, as discussed in section 4.1.

Step 3: Each LR image is divided into 8x8 non overlapping blocks; DCT is applied to each block.

Step 4: Zonal mask is applied to low frequency components and high frequency components are discarded.

Step 5: Iterative Blind Deconvolution (IBD) is applied to remove the blur present in the images.

Step 6: Restoration is performed in order to remove the blur and noise present in the image.

Step 7: The restored images are fused using maximum frequency fusion.

V. CONCLUSION AND FUTURE WORK

In this paper we have proposed a novel DCT based Progressive reconstruction of super resolution image from a set of low resolution images. Our proposed novel zonal filter based denosing retains the low frequency components and discards the high frequency components as most of the noise will be present in the high frequency components. Different zonal masks are applied to obtain optimized results. Experiments are conducted on different natural images corrupted by various noise levels to access the performance of the proposed method in comparison with other methods. The advantage of our proposed approach is that low frequency components are transmitted progressively, at each stage of transmission the quality of the image is enhanced. Finally adaptive interpolation is applied to reconstruct a super resolution image. We reable to obtain very high PSNR and ISNR value when compared to the state of art super resolution reconstruction. We are able to obtain a very high super resolution image with super resolution factor of 2, 4 times than that of the original image. Experimental results show that our proposed method performs quite well in terms of robustness and efficiency. components are transmitted progressively, at each stage of transmission the quality of the image is enhanced. Finally adaptive interpolation is applied to reconstruct a super resolution image. We are able to obtain very high PSNR and ISNR value when compared to the state of art super resolution reconstruction. We are able to obtain a very high super resolution image with super resolution factor of 2, 4 times than that of the original image. Experimental results show that our proposed method performs quite well in terms of robustness and efficiency.

VI. REFERENCES

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