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Survey on De- noising and contrast Enhancement Techniques.

KS Madhu Mauthe, G Maria Rafols, and K Srilatha*.

Department of Electronics and Communication Engineering, Sathyabama University, Chennai, Tamilnadu, India.

ABSTRACT

Image enhancement is a process of refining the quality of the image in digital image processing. Here CLAHE algorithm and bilateral filter is used. Enhancement of an image which includes contrast and sharpness is required in many applications. One of the most common problem arise is due to weather conditions, fog has whitening effect which leads to the decline of image contrast, gained by optical equipment, and produces mistily to the image. The image gained in the foggy weather is not clear, therefore the blurrily image's restoration can be regarded as the image contrast enhancement problem. Firstly, carry on the Dual-Tree complex wavelet decomposition to the image, and then obtain the low frequency component and high-frequency components of image, use the Bilateral filter to low-frequency component, while utilize soft threshold based on level dependent threshold estimation to process high-frequency components, Finally the simulated results shows that used approaches provides better accuracy in image contents preservation with high signal to noise ratio rather than exist methods.

Keywords: survey, de-noising, contrast.

Corresponding author

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INTRODUCTION

A digital device as a consumer digital camera often suffers from varying light conditions because of its narrower dynamic range. The captured image could contain underexposed and overexposed regions. And the image has low local contrast in both underexposed and overexposed areas. Therefore an enhancement algorithm which enhances the image's visual quality K.Srilatha, S.Kaviyarasu et al [11]. This paper discusses the issue of illumination estimation in many enhancement algorithms that are based on decomposition. The exception that avails the contrast enhancement is also specified. A method on the limited contrast enhancement that results from the low smoothing capability of a traditional nonlinear filter Madhava, V, Yogesh,R, Srilatha,K et al [6]. This algorithm achieves better visual quality than some previous algorithms and here the contrast of the colour image is enhanced.

LITERATURE SURVEY

NOISE REDUCTION IN HYPERSPECTRAL IMAGES THROUGH SPECTRAL UNMIXING-Daniele Cerra, Rupert Muller

The hyper spectral images of de noising have been observed as distinct problem. By seeing the properties of a mixed spectrum, this paper introduces an overseen methodology expressing the pixel as a linear combination of the reference spectra in a hyper spectral scene. After the un mixing process, the remaining vector is mostly composed by the sensor induced noise, atmospheric unwanted influences and uninteresting arterials and thus ignored in the reconstruction of spectrum. The proposed method, stands in its simplicity and it is able to remove the noise effectively for spectral bands with both low and high signal-to-noise ratio. Experiments shows that this method could be used to recover spectral information from degraded bands, such that ones placed at edge between ultraviolet frequency and visible light frequency, which are usually rejected in practical applications. The proposed method gives better results by improving the visual quality, if the mean squared error is kept constant. Which leads to questioning the rationality of mean squared error as a predictor for the quality of an image in remote sensing applications. The main drawback is its wavelength which is long.

EFFICIENT CONTRAST ENHANCEMENT USING ADAPTIVE GAMMA CORRECTION WITH WEIGHTING DISTRIBUTION-Shih-Chia Huang, Fan- Chieh Cheng

This paper provides an effective method to modify histograms and enhance the digital image by improving the contrast in digital images. Enhancement plays a significant role in digital image processing, pattern recognition and computer vision. We provide an automatic transformation technique that advances the brightness of dimmed images via probability distribution of luminance pixels and gamma correction. To enhance the video, the proposed enhancement method uses temporal information concerning the differences between each frame to decrease computational complexity. Experimental results reveal that the proposed method provides us the enhanced images of comparably higher quality than those produced using previous state-of-the-art methods. The drawback is Different images will exhibit the same changes in intensity as a result of the fixed parameter.

Table.1: Performance (FPS) Evaluation for the Proposed TB Method

Campus Sequence With 600 Frames and 352 × 288 Pixels Per Frame (Statistic Camera)									
Method	THE	BBHE	DSIHE	RSIHE	RSWHE	DCRGC	AWMHE	CVC	AGCWD
Original fps	1190	1172	1181	1167	1158	1165	1152	5	1170
Improved fps	5505	4959	1042	4878	4724	4839	4651	296	4918
Home Sequence With 360 Frames and 480 × 270 Pixels Per Frame (Dynamic Camera)									
Method	THE	BBHE	DSIHE	RSIHE	RSWHE	DCRGC	AWMHE	CVC	AGCWD
Original fps	1198	1190	1187	1179	1169	1172	1162	6	1176
Improved fps	3482	3449	3416	3384	3293	3323	3263	12	3353

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HYPERSPECTRAL IMAGE RESOLUTION ENHANCEMENT USING HIGH-RESOLUTION MULTISPECTRAL IMAGE BASED ON SPECTRAL UNMIXING-Mohamed Amine Bendoumi, Mingyi He

In this paper, a hyper spectral (HS) image resolution enhancement algorithm based on spectral unmixing is provided for the fusion of high and low spatial resolution multispectral image which is (MS) and (HSI). As a result, a high-spatial-resolution HSI are reconstructed based on the high spectral features of the HSI. The HIS is represented by end members and the high spatial features of the MS image represented by abundances. Since the number of end members extracted from the MS image cannot overdo the number of bands in least-square based spectral unmixing algorithm, huge reconstruction errors will follow for the HSI, the fusion performance degrades the enhanced HSI. Therefore, in this paper, a novel fusion framework is also proposed by dividing the complete image into several subimages, based on the performance of the proposed spectral-unmixing-based fusion algorithm can be improved further. Finally, experiments on the Hyperspectral Digital Imagery Collection and Airborne Visible/Infrared Imaging Spectrometer data exhibit that the proposed fusion algorithms outstrip other well-known fusion methods in both spectral and spatial domains .The drawback is reconstruction error.

Table.2.Comparsion of PSNR, SAM, SSIM vs Time

		PSNR	SAM	SSIM	TIME
Washington DC	Algorithm 2	**43.71**	**0.9183**	**0.9820**	**10.01**
	CNMF	41.33	0.9984	0.9597	416.71
	SMM-MAP	39.74	0.9978	0.9706	149.48
Indian Pine	Algorithm 2	**41.77**	**0.7440**	**0.9222**	**3.88**
	CNMF	41.37	0.7674	0.9190	98.59
	SMM-MAP	40.77	0.7980	0.9187	15.06

MULTILEVEL-DWT BASED IMAGE DE-NOISING USING FEED FORWARD ARTIFICIAL NEURAL NETWORK-Torali Saikia and Kandarpa Kumar Sarma

In this paper, during image acquisition, retrieval or transmission, storage images get corrupted due to occurrence of noise. With altered varieties of noise and its extent and de-noising becomes challenging. Usually, a mass of methods have considered statistic, spatial and multiple domain approaches for de-noising. Yet, the possibility always occur for exploring advanced means of performing de-noising for improving the image quality. In the proposed work, we provide an approach for de-noising images by combining the features of Feed Forward Artificial Neural Network (FF ANN) and multilevel Discrete Wavelet Transform (DWT). We apply our algorithm to de-noise the images degraded by a type of multiplicative noise known as speckle noise. The results demonstrate that the proposed technique verifies effective for a range of variations and it is even suitable for critical applications. The drawback is speckle noise which is a multiplicative noise.

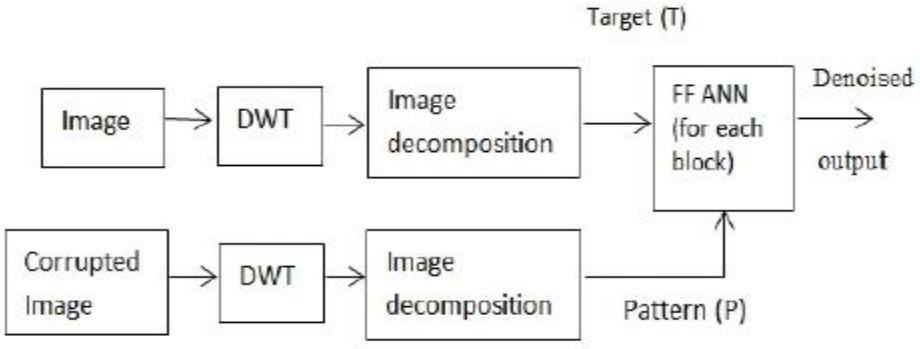

Fig.1:the proposed metod of multilevel-dwt based image de-noising using feed forward artificial neural network

Table.3.Comparative Analysis of PSNR Values of Different De-Nosing Methods

Image	Noisy image	Denoised image (MF)	Denoised image (BF)	Denoised image (WF)	Denoised image (Proposed method)
Cameraman	70.79	74.22	74.73	76.27	78.06
Lena	71.24	74.78	74.66	75.88	77.41
Mandril	69.71	70.93	72.13	71.01	73.65

CONTRAST ENHANCEMENT-BASED FORENSICS IN DIGITAL IMAGES-Gang Cao, Yao Zhao, *Senior Member, IEEE*, Rongrong Ni, *Member, IEEE*, and Xuelong Li,

Contrast enhancement is typically used to adjust the brightness and contrast of digital images. Malevolent users may also perform contrast enhancement for creating a realistic composite image. As it is significant is to detect the contrast enhancement blindly for validating the originality and authenticity of the digital images. This paper proposes two algorithms to detect the contrast enhancement involved manipulations in digital images. Detection of global contrast enhancement is applied to the previously JPEG-compressed images, which are widespread in real applications and it is processed to recognize the composite image produced by implementing contrast adjustment on either one or both source regions. The consistency between local artifacts is verified for seeing the image forgeries and locating the composition boundary.The focus should be on security on countering the existing and potential anti-forensic techniques and to improve the robustness against postprocessing.

CONCLUSION

This paper discusses about the illumination problems and problem arises during the contrast enhancement of colour images. The algorithm is extended to the colour channels without causing the graying effect. The luminance and chrominace are accounted to enhance the colour image, also the low frequency component gives smooth mask and high frequency component shows sharpened edges.And finally we provide the enhanced digital image by improving the quality of an image comparably high than the previous tasks.

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