

# MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

## 2015 IEEE IMAGE PROCESSING PROJECT LIST BASED ON MATLAB

### **1. A perception based color image adaptive watermarking scheme in YCbCr space**

Copyright protection has now become a challenging domain in real life scenario. Digital watermarking scheme is an important tool for copyright protection technique. A good quality watermarking scheme should have high perceptual transparency, and should also be robust enough against possible attacks. A well-known (Lewis-Barni) Human Visual System (HVS) based watermarking model is fairly successful with respect to the first mentioned criterion, though its effectiveness in color images has not been claimed. Furthermore, it is true that although several watermarking schemes are available in literature for grayscale images, relatively few works have been done in color image watermarking, and the little that have been done, have mostly been tested in RGB, YUV, YIQ color spaces. Thus the question remains that, which is the optimal color space for color image watermarking and whether this HVS model is applicable for that color space. There are two main contributions of the present work with respect to the above. First, it claims that for color image watermarking, the YCbCr space can be used as the perceptually optimum color space, the Cb component being the optimal color channel here. Second, it also tests the effectiveness of the above-mentioned HVS model in that color space. These have been achieved by using the HVS model to propose a new non-blind (original image and the watermark logo image both are needed for extraction) image adaptive Discrete Wavelet transform and Singular Value Decomposition (DWT/SVD) based color image watermarking scheme in YCbCr color space. The multi-resolution property of DWT and stability of SVD additionally makes the scheme robust against attacks, while the Arnold scrambling, of the watermark, enhances the security in our method. The experimental results support the superiority of our scheme over the existing methods.

### **2. Robust Watermarking by SVD of Watermark Embedded in DKT-DCT and DCT Wavelet Column Transform of Host Image**

Watermarking in wavelet domain and with SVD is popular due to its robustness. In this paper a watermarking technique using DCT wavelet and hybrid DKT-DCT wavelet along with SVD is proposed. Wavelet transform is applied on host and SVD is applied on watermark. Few singular values of watermark are embedded in mid frequency band of host. Scaling of singular values is adaptively done for each channel (Red, green and blue) using the highest transform coefficient from selected mid frequency band and first singular value of corresponding channel of watermark. Singular values of watermark are placed at the index positions of closely matching transform coefficients. This along with the adaptive selection of scaling factor adds to the robustness of watermarking technique. Performance of the proposed technique is evaluated against image processing attacks like cropping, compression using orthogonal transforms, noise addition, histogram equalization and resizing. Performance for DCT wavelet and DKT-DCT wavelet is compared and in many of the attacks DCT wavelet is found to be better than DKT-DCT wavelet.

### **3. Study and Analysis of Robust DWT-SVD Domain Based Digital Image Watermarking Technique Using MATLAB**

This paper presents a robust and blind digital image watermarking technique to achieve copyright protection. In order to protect copyright material from illegal duplication, various technologies have been developed, like key-based cryptographic technique, digital watermarking etc. In digital watermarking, a signature or copyright message is secretly embedded in the image by using an algorithm. In our paper, we implement that algorithm of digital watermarking by combining both DWT and SVD techniques. Initially, we decompose the original (cover) image into 4 sub-bands using 2-D DWT, and then we apply the SVD on each band by modifying their singular values. After subjecting the watermarked image to various attacks like blurring, adding noise, pixelation, rotation, rescaling, contrast adjustment, gamma correction, histogram equalization, cropping, sharpening, lossy compression etc, we extract the originally inserted watermark image from all the bands and compare them on the basis of their MSE and PSNR values. Experimental results are provided to illustrate that if we perform modification in all frequencies, then it will make our watermarked

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

image more resistant to a wide range of imageprocessing attacks (including common geometric attacks), i.e. we can recover the watermark from any of the four sub-bands efficiently.

### 4. Towards Practical Self-Embedding for JPEG-Compressed Digital Images

This paper deals with the design of a practical self-recovery mechanism for lossy compressed JPEG images. We extend a recently proposed model of the content reconstruction problem based on digital fountain codes to take into account the impact of emerging watermark extraction and block classification errors. In contrast to existing methods, our scheme guarantees a high and stable level of reconstruction quality. Instead of introducing reconstruction artifacts, emerging watermark extraction errors penalize the achievable tampering rates. We introduce new mechanisms that allow for handling high-resolution and color images efficiently. In order to analyze the behavior of our scheme, we derive an improved model to calculate the reconstruction success probability. We introduce a new hybrid mechanism for spreading the reference information over the entire image, which allows to find a good balance between the achievable tampering rates and the computational complexity. Such an approach reduced the watermark embedding time from the order of several minutes to the order of single seconds, even on mobile devices.

### 5. Fusion of MS and PAN Images Preserving Spectral Quality

Image fusion aims at improving spectral information in a fused image as well as adding spatial details to it. Among the existing fusion algorithms, filter-based fusion methods are the most frequently discussed cases in recent publications due to their ability to improve spatial and spectral information of multispectral (MS) and panchromatic (PAN) images. Filter-based approaches extract spatial information from the PAN image and inject it into MS images. Designing an optimal filter that is able to extract relevant and nonredundant information from the PAN image is presented in this letter. The optimal filter coefficients extracted from statistical properties of the images are more consistent with type and texture of the remotely sensed images compared with other kernels such as wavelets. Visual and statistical assessments show that the proposed algorithm clearly improves the fusion quality in terms of correlation coefficient, relative dimensionless global error in synthesis, spectral angle mapper, universal image quality index, and quality without reference, as compared with fusion methods, including improved intensity–hue–saturation, multiscale Kalman filter, Bayesian, improved nonsubsampling contourlet transform, and sparse fusion of image.

Index Terms—Directional filter, image fusion, optimal filter, pan-sharpening, spectral information.

### 6. Multifocus Image Fusion Based on NSCT and Focused Area Detection

To overcome the difficulties of sub-band coefficients selection in multiscale transform domain-based image fusion and solve the problem of block effects suffered by spatial domain-based image fusion, this paper presents a novel hybrid multifocus image fusion method. First, the source multifocus images are decomposed using the nonsubsampling contourlet transform (NSCT). The low-frequency sub-band coefficients are fused by the sum-modified-Laplacian-based local visual contrast, whereas the high-frequency sub-band coefficients are fused by the local Log-Gabor energy. The initial fused image is subsequently reconstructed based on the inverse NSCT with the fused coefficients. Second, after analyzing the similarity between the previous fused image and the source images, the initial focus area detection map is obtained, which is used for achieving the decision map obtained by employing a mathematical morphology postprocessing technique. Finally, based on the decision map, the final fused image is obtained by selecting the pixels in the focus areas and retaining the pixels in the focus region boundary as their corresponding pixels in the initial fused image. Experimental results demonstrate that the proposed method is better than various existing transform-based fusion methods, including gradient pyramid transform, discrete wavelet transform, NSCT, and a spatial-based method, in terms of both subjective and objective evaluations.

Index Terms—Multi-focus image fusion, non-subsampling contourlet transform, Log-Gabor energy, focused area detection, mathematical morphology.

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing))

### 7. Optimizing Image Segmentation by Selective Fusion of Histogram based K-Means Clustering

We present a simple, reduced-complexity and efficient image segmentation and fusion approach. It optimizes the segmentation process of coloured images by fusion of histogram based K-means clusters in various colour spaces. The initial segmentation maps are produced by taking a local histogram of each pixel and allocating it to a bin in the re-quantized colour space. The pixels in the re-quantized colour spaces are clustered into classes using the K-means (Euclidean Distance) technique. The initial segmentation maps from the six colour spaces are then fused together by various techniques and performance metrics are evaluated. A selective fusion procedure is followed to reduce the computational complexity and achieve a better segmented image. The parameters considered for selection of initial segmentation maps include entropy, standard deviation and spatial frequency etc. The performance of the proposed method is analysed by applying on various images from Berkeley image database. The results indicate an increased entropy in the segmented image as compared to other methods along with reduced complexity, processing time and hardware resources required for real time implementation.

Index Terms—Berkeley image database, colour spaces, fusion, histogram, image segmentation and K-Means clustering.

### 8. Medical Image Fusion by Combining SVD and Shearlet Transform

The method of incorporating information from multiple images into a single image to get enhanced imaging quality and reduce randomness and redundancy in medical images for diagnosis and assessment of medical problems. In this paper, we present a new technique for medical image fusion using Singular Value Decomposition (SVD) method on Shearlet Transform (ST) domain to improve the information content of an image by fusing images like positron emission tomography (PET) and magnetic resonance imaging (MRI) images. The proposed method first transforms the source image into shearlet-image by using Shearlet Transform (ST). Then, we have used SVD model in lowpass sub-band and selected modified sub-bands according to their local characteristics. The composition of different high-pass subband coefficients are processed by ST decomposition. Then the high and the low sub-band are fused. Finally, the fused image is reconstructed by performing the inverse shearlet transform (IST). We have used three benchmark images to carry out our experiment and compare with many state-of-art techniques. Experimental results demonstrate that the proposed method outperforms many state-of-the-art techniques in both subjective and objective evaluation criteria.

### 9. Comparison of Pixel-Level and Feature Level Image Fusion Methods

In recent times multiple imaging sensors are employed in several applications such as surveillance, medical imaging and machine vision. In these multi-sensor systems there is a need for image fusion techniques to effectively combine the information from disparate imaging sensors into a single composite image which enables a good understanding of the scene. The prevailing fusion algorithms employ either the mean or choose-max fusion rule for selecting the best coefficients for fusion at each pixel location. The choose-max rule distorts constants background information whereas the mean rule blurs the edges. Hence, in this proposed paper, the fusion rule is replaced by a soft computing technique that makes intelligent decisions to improve the accuracy of the fusion process in both pixel and feature based image fusion. Non Sub-sampled Contourlet Transform (NSCT) is employed for multi-resolution decomposition as it is demonstrated to capture the intrinsic geometric structures in images effectively. Experiments demonstrate that the proposed pixel and feature level image fusion methods provides better visual quality with clear edge information and objective

quality indexes than individual multiresolution-based methods such as discrete wavelet transform and NSCT.

### 10. A New Secure Image Transmission Technique via Secret-Fragment-Visible Mosaic Images by Nearly Reversible Color Transformations

A new secure image transmission technique is proposed, which transforms automatically a given large-volume secret image into a so-called secret-fragment-visible mosaic image of the same size. The mosaic image, which looks similar to

## **MATLAB PROJECT ABSTRACTS**

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing))

an arbitrarily selected target image and may be used as a camouflage of the secret image, is yielded by dividing the secret image into fragments and transforming their color characteristics to be those of the corresponding blocks of the target image. Skillful techniques are designed to conduct the color transformation process so that the secret image may be recovered nearly losslessly. A scheme of handling the overflows/underflows in the converted pixels' color values by recording the color differences in the untransformed color space is also proposed. The information required for recovering the secret image is embedded into the created mosaic image by a lossless data hiding scheme using a key. Good experimental results show the feasibility of the proposed method.

### **11. A Pan-Sharpener Based on the Non-Subsampled Contourlet Transform: Application to Worldview-2 Imagery**

Two pan-sharpening methods based on the nonsubsampled contourlet transform (NSCT) are proposed. NSCT is very efficient in representing the directional information and capturing intrinsic geometrical structures of the objects. It has characteristics of high resolution, shift-invariance, and high directionality. In the proposed methods, a given number of decomposition levels are used for multispectral (MS) images while a higher number of decomposition levels are used for Pan images relatively to the ratio of the Pan pixel size to the MS pixel size. This preserves both spectral and spatial qualities while decreasing computation time. Moreover, upsampling of MS images is performed after NSCT and not before. By applying upsampling after NSCT, structures and detail information of the MS images are more likely to be preserved and thus stay more distinguishable. Hence, we propose to exploit this property in pan-sharpening by fusing it with detail information provided by the Pan image at the same fine level. The proposed methods are tested on WorldView-2 datasets and compared with the standard pan-sharpening technique. Visual and quantitative results demonstrate the efficiency of the proposed methods. Both spectral and spatial qualities have been improved.

### **12. A New Iterative Triclass Thresholding Technique in Image Segmentation**

We present a new method in image segmentation that is based on Otsu's method but iteratively searches for subregions of the image for segmentation, instead of treating the full image as a whole region for processing. The iterative method starts with Otsu's threshold and computes the mean values of the two classes as separated by the threshold. Based on the Otsu's threshold and the two mean values, the method separates the image into three classes instead of two as the standard Otsu's method does. The first two classes are determined as the foreground and background and they will not be processed further. The third class is denoted as a to-be-determined (TBD) region that is processed at next iteration. At the succeeding iteration, Otsu's method is applied on the TBD region to calculate a new threshold and two class means and the TBD region is again separated into three classes, namely, foreground, background, and a new TBD region, which by definition is smaller than the previous TBD regions. Then, the new TBD region is processed in the similar manner. The process stops when the Otsu's thresholds calculated between two iterations is less than a preset threshold. Then, all the intermediate foreground and background regions are, respectively, combined to create the final segmentation result. Tests on synthetic and real images showed that the new iterative method can achieve better performance than the standard Otsu's method in many challenging cases, such as identifying weak objects and revealing fine structures of complex objects while the added computational cost is minimal.

### **13. Optimization of Segmentation Algorithms Through Mean-Shift Filtering Preprocessing**

This letter proposes an improved mean-shift filtering method. The method is added as a preprocessing step for regional segmentation methods, which aims at benefiting segmentations in a more general way. Using this method, first, a logistic regression model between two edge cues and semantic object boundaries is established. Then, boundary posterior probabilities are predicted by the model and associated with weights in the mean-shift filtering iteration. Finally, the filtered image, instead of the original image, is put into segmentation methods. In experiments, the regression model is trained with an aerial image, which is tested with an aerial image and a QuickBird image. Two popular segmentation

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing))

methods are adopted for evaluations. Both quantitative and qualitative evaluations reveal that the presented procedure facilitates a superior image segmentation result and higher classification accuracy.

### 14. Security Attacks on the Wavelet Transform and Singular Value Decomposition Image Watermarking

Two vulnerable attacks on the wavelet transform (WT) and Singular Value Decomposition (SVD) based image watermarking scheme are presented in this paper. The WT-SVD based watermarking is robust against various common image manipulations and geometrical attacks; however, it cannot resist against two security attacks, i.e. an attacker attack which successfully claims the real owner's watermarked image, and owner attack which correctly extracts watermark from any arbitrary image. As proved in this study, the SVD watermarking scheme cannot provide trustworthy evidence in rightful ownership protection. In addition, the robustness of the SVD watermarking scheme is a result of improper algorithm design.

### 15. Pansharpening Using Regression of Classified MS and Pan Images to Reduce Color Distortion

The synthesis of low-resolution panchromatic (Pan) image is a critical step of ratio enhancement (RE) and component substitution (CS) pansharpening methods. The two types of methods assume a linear relation between Pan and multispectral (MS) images. However, due to the nonlinear spectral response of satellite sensors, the qualified low-resolution Pan image cannot be well approximated by a weighted summation of MS bands. Therefore, in some local areas, significant gray value difference exists between a synthetic Pan image and a high-resolution Pan image. To tackle this problem, the pixels of Pan and MS images are divided into several classes by k-means algorithm, and then multiple regression is used to calculate summation weights on each group of pixels. Experimental results demonstrate that the proposed technique can provide significant improvements on reducing color distortion.

### 16. Discrete Wavelet Transform and Gradient Difference based approach for text localization in videos

The text detection and localization is important for video analysis and understanding. The scene text in video contains semantic information and thus can contribute significantly to video retrieval and understanding. However, most of the approaches detect scene text in still images or single video frame. Videos differ from images in temporal redundancy. This paper proposes a novel hybrid method to robustly localize the texts in natural scene images and videos based on fusion of discrete wavelet transform and gradient difference. A set of rules and geometric properties have been devised to localize the actual text regions. Then, morphological operation is performed to generate the text regions and finally the connected component analysis is employed to localize the text in a video frame. The experimental results obtained on publicly available standard ICDAR 2003 and Hua dataset illustrate that the proposed method can accurately detect and localize texts of various sizes, fonts and colors. The experimentation on huge collection of video databases reveal the suitability of the proposed method to video databases.

### 17. A Pansharpening Method Based on the Sparse Representation of Injected Details

The application of sparse representation (SR) theory to the fusion of multispectral (MS) and panchromatic images is giving a large impulse to this topic, which is recast as a signal reconstruction problem from a reduced number of measurements. This letter presents an effective implementation of this technique, in which the application of SR is limited to the estimation of missing details that are injected in the available MS image to enhance its spatial features. We propose an algorithm exploiting the details self-similarity through the scales and compare it with classical and recent pansharpening methods, both at reduced and full resolution. Two different data sets, acquired by the WorldView-2 and IKONOS sensors, are employed for validation, achieving remarkable results in terms of spectral and spatial quality of the fused product.

### 18. Research on the rice counting method based on connected component labeling

#56, II Floor, Pushpagiri Complex, 17<sup>th</sup> Cross 8<sup>th</sup> Main, Opp Water Tank, Vijaynagar, Bangalore-560040.

Website: [www.citlprojects.com](http://www.citlprojects.com), Email ID: [citlprojectsieee@gmail.com](mailto:citlprojectsieee@gmail.com), [projects@citlindia.com](mailto:projects@citlindia.com)

MOB: 9886173099, Whatsapp: 9986709224, PH : 080 -23208045 / 23207367.

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

Rice counting is essential to modern agricultural production sector, counting accuracy directly impact assessment of the merits of rice. In order to solve the problems of time-consuming and labor-intensive and low-precision existing in traditional manual counting and outline counting this paper uses image processing technology to count rice. Considering the rice overlapping segmentation is not ideal, this paper uses dynamic threshold method to binary the image and then extracts and labels connected domain. Finally, this method gets the number of rice through processing area of each connected domain.

### 19. A Novel Secure Image Steganography Method Based On Chaos Theory In Spatial Domain

This paper presents a novel approach of building a secure data hiding technique in digital images. The image steganography technique takes the advantage of limited power of human visual system (HVS). It uses image as cover media for embedding secret message. The most important requirement for a steganographic algorithm is to be imperceptible while maximizing the size of the payload. In this paper a method is proposed to encrypt the secret bits of the message based on chaos theory before embedding into the cover image. A 3-3-2 LSB insertion method has been used for image steganography. Experimental results show a substantial improvement in the Peak Signal to Noise Ratio (PSNR) and Image Fidelity (IF) value of the proposed technique over the base technique of 3-3-2 LSB insertion.

### 20. Improved LSB based Steganography Techniques for Color Images in Spatial Domain

This research paper aims to propose a new improved approach for Information Security in RGB Color Images using a Hybrid Feature detection technique; Two Component based Least Significant Bit (LSB) Substitution Technique and Adaptive LSB substitution technique for data hiding. Advanced Encryption Standard (AES) is used to provide Two Tier Security; Random Pixel Embedding imparts resistant to attacks and Hybrid Filtering makes it immune to various disturbances like noise. An image is combination of edge and smooth areas which gives an ample opportunity to hide information in it. The proposed work is direct implementation of the principle that edge areas being high in contrast, color, density and frequency can tolerate more changes in their pixel values than smooth areas, so can be embedded with a large number of secret data while retaining the original characteristics of image. The proposed approach achieved Improved Imperceptibility, Capacity than the various existing techniques along with Better Resistance to various Steganalysis attacks like Histogram Analysis, Chi-Square and RS Analysis as proven experimentally.

### 21. A Secure Image Steganography Based on RSA Algorithm and Hash-LSB Technique

Steganography is a method of hiding secret messages in a cover object while communication takes place between sender and receiver. Security of confidential information has always been a major issue from the past times to the present time. It has always been the interested topic for researchers to develop secure techniques to send data without revealing it to anyone other than the receiver. Therefore from time to time researchers have developed many techniques to fulfill secure transfer of data and steganography is one of them. In this paper we have proposed a new technique of image steganography i.e. Hash-LSB with RSA algorithm for providing more security to data as well as our data hiding method. The proposed technique uses a hash function to generate a pattern for hiding data bits into LSB of RGB pixel values of the cover image. This technique makes sure that the message has been encrypted before hiding it into a cover image. If in any case the cipher text got revealed from the cover image, the intermediate person other than receiver can't access the message as it is in encrypted form.

### 22. A Novel Approach On Image Steganographic Methods For Optimum Hiding Capacity.

Steganography gained importance in the past few years due to the increasing need for providing secrecy in an open environment like the internet. Steganography is the art of hiding the fact that communication is taking place, by hiding information in other information. Many different carrier file formats can be used, but digital images are the most popular because of their frequency on the internet Steganography is used to conceal the information so that no one can sense

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

its existence. In most algorithm used to secure information both steganography and cryptography are used together to secure a part of information. Steganography has many technical challenges such as high hiding capacity and imperceptibility. In this paper, we try to optimize these two main requirements by proposing a novel technique for hiding data in digital images by combining the use of adaptive hiding capacity function that hides secret data in the integer wavelet coefficients of the cover image with the optimum pixel adjustment (OPA) algorithm. The coefficients used are selected according to a pseudorandom function generator to increase the security of the hidden data. The OPA algorithm is applied after embedding secret message to minimize the embedding error. The proposed system showed high hiding rates with reasonable imperceptibility compared to other steganographic system.

### 23. A Proposed Method In Image Steganography To Improve Image Quality With Lsb Technique

Image steganography is becoming an important area in the field of steganography. As the demand of security and privacy increases, need of hiding their secret information is going on. If a user wants to send their secret information to other persons with security and privacy he can send it by using image steganography. During the last few years lot of different methods of hiding information has been done in this field. Some of the existing methods for hiding information give good results only in case of information gets hidden successfully. LSB is the most popular Steganography technique. It hides the secret message in the RGB image based on its binary coding. LSB algorithm is used to hide the secret messages by using algorithm. LSB changes the image resolution quite clear as well as it is easy to attack. It is clear that LSB changes the image resolution when the least significant bits add in the binary image format, so that image quality become burst and there become so much difference in the original image and encoded image in the respect of image quality. So to overcome this problem, In this thesis I suggested modifying the LSB technique so that we can get same image quality as it has before the encoding. The basic idea to get good image quality, I am going to modify the hiding procedure of the least significant bit. In this step I will hide two bits by two bits by taking identical values.

### 24. Satellite Image Fusion using Fast Discrete Curvelet Transforms

fusion based on the Fourier and wavelet transform methods retain rich multispectral details but less spatial details from source images. Wavelets perform well only at linear features but not at non linear discontinuities because they do not use the geometric properties of structures. Curvelet transforms overcome such difficulties in feature representation. In this paper, we define a novel fusion rule via high pass modulation using Local Magnitude Ratio (LMR) in Fast Discrete Curvelet Transforms (FDCT) domain. For experimental study of this method Indian Remote Sensing (IRS) Resourcesat-1 LISS IV satellite sensor image of spatial resolution of 5.8m is used as low resolution (LR) multispectral image and Cartosat-1 Panchromatic (Pan) of spatial resolution 2.5m is used as high resolution (HR) Pan image. This fusion rule generates HR multispectral image at 2.5m spatial resolution. This method is quantitatively compared with Wavelet, Principal component analysis (PCA), High pass filtering (HPF), Modified Intensity-Hue-Saturation (M.IHS) and Grams-Schmidt fusion methods. Proposed method spatially outperform the other methods and retains rich multispectral details.

### 25. Medical Image Fusion Based on Joint Sparse Method

In this paper, a novel joint image fusion algorithm which is the hybrid of Orthogonal Matching Pursuit (OMP) and Principal Component Analysis (PCA) is proposed to properly utilize the advantages and to overcome the disadvantages of both OMP and PCA methods. Firstly, common and innovative images are extracted from the source images. Secondly, sparse PCA method is employed to fuse the information of innovative features. Then weighted average fusion is used to fuse the sparse PCA result with the common feature thereby preserving the edge information and high spatial resolution. We demonstrate this methodology on medical images from different sources and the experimental results proves the robustness of the proposed method.

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing))

### 26. Survey on Multi-Focus Image Fusion Algorithms

Image fusion is a technique of combining source images i.e. multi-modal, multi-focus etc. to obtain a new more informative image. Multi-focus image fusion algorithm combines different images having different parts in focus. Applications of image fusion includes remote sensing, digital camera etc. This paper describes various multi-focus image fusion algorithms which uses different focus measure such as spatial frequency, energy of image laplacian, morphological opening and closing etc. The performance of these algorithms is analyzed based on how focused regions in images are determined to get a fused image. The method used for multi-focus image fusion is identifying the focused regions and combine them together to get an enhanced image.

### 27. PET and MRI Brain Image Fusion Using Wavelet Transform with Structural Information Adjustment and Spectral Information Patching

In this paper, we present a PET and MR brain image fusion method based on wavelet transform for low- and high-activity brain image regions, respectively. Our method can generate very good fusion result by adjusting the anatomical structural information in the gray matter (GM) area, and then patching the spectral information in the white matter (WM) area after the wavelet decomposition and gray-level fusion. We used normal axial, normal coronal, and Alzheimer's disease brain images as the three datasets for testing and comparison. Experimental results showed that the performance of our fusion method is better than that of IHS+RIM fusion method in terms of spectral discrepancy (SD) and average gradient (AG). In fact, our method is superior to IHS+RIM method both visually and quantitatively.

### 28. Adaptive and non-adaptive data hiding methods for grayscale images based on modulus function

This paper presents two adaptive and non-adaptive data hiding methods for grayscale images based on modulus function. Our adaptive scheme is based on the concept of human vision sensitivity, so the pixels in edge areas than to smooth areas can tolerate much more changes without making visible distortion for human eyes. In our adaptive scheme, the average differencing value of four neighborhood pixels into a block via a threshold secret key determines whether current block is located in edge or smooth area. Pixels in the edge areas are embedded by Q-bit of secret data with a larger value of Q than that of pixels placed in smooth areas. Also in this scholar, we represent one non-adaptive data hiding algorithm. Our non-adaptive scheme, via an error reduction procedure, produces a high visual quality for stego-image. The proposed schemes present several advantages. 1-of aspects the embedding capacity and visual quality of stego-image are scalable. In other words, the embedding rate as well as the image quality can be scaled for practical applications 2-the high embedding capacity with minimal visual distortion can be achieved, 3-our methods require little memory space for secret data embedding and extracting phases, 4-secret keys have used to protect of the embedded secret data. Thus, level of security is high, 5-the problem of overflow or underflow does not occur. Experimental results indicated that the proposed adaptive scheme significantly is superior to the currently existing scheme, in terms of stego-image visual quality, embedding capacity and level of security and also our non-adaptive method is better than other non-adaptive methods, in view of stego-image quality. Results show which our adaptive algorithm can resist against the RS steganalysis attack.

### 29. AN EFFICIENT MODIFIED STRUCTURE OF CDF 9/7 WAVELET BASED ON ADAPTIVE LIFTING WITH SPIHT FOR LOSSY TO LOSSLESS IMAGE COMPRESSION

We present a modified structure of 2-D CDF 9/7 wavelet transforms based on adaptive lifting in image coding. Instead of alternately applying horizontal and vertical lifting, as in present practice, Adaptive lifting performs lifting-based prediction in local windows in the direction of high pixel correlation. Hence, it adapts far better to the image orientation features in local windows. The predicting and updating signals of Adaptive lifting can be derived even at the fractional pixel precision level to achieve high resolution, while still maintaining perfect reconstruction. To enhance the performance of adaptive based modified structure of 2-D CDF 9/7 is coupled with SPIHT coding algorithm to improve the drawbacks of wavelet transform. Experimental results shows that the proposed scaling coefficients of modified structure based on adaptive lifting for image coding technique outperforms JPEG 2000 in both PSNR and visual quality, with the improvement up to 6.0 dB than existing structure on images with rich orientation features

#56, II Floor, Pushpagiri Complex, 17<sup>th</sup> Cross 8<sup>th</sup> Main, Opp Water Tank, Vijaynagar, Bangalore-560040.

Website: [www.citlprojects.com](http://www.citlprojects.com), Email ID: [citlprojectsieee@gmail.com](mailto:citlprojectsieee@gmail.com), [projects@citlindia.com](mailto:projects@citlindia.com)

MOB: 9886173099, Whatsapp: 9986709224, PH : 080 -23208045 / 23207367.

## **MATLAB PROJECT ABSTRACTS**

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

### **30. Occlusion Handling via Random Subspace Classifiers for Human Detection**

This paper describes a general method to address partial occlusions for human detection in still images. The random subspace method (RSM) is chosen for building a classifier ensemble robust against partial occlusions. The component classifiers are chosen on the basis of their individual and combined performance. The main contribution of this work lies in our approach's capability to improve the detection rate when partial occlusions are present without compromising the detection performance on non occluded data. In contrast to many recent approaches, we propose a method which does not require manual labeling of body parts, defining any semantic spatial components, or using additional data coming from motion or stereo. Moreover, the method can be easily extended to other object classes. The experiments are performed on three large datasets: the INRIA person dataset, the Daimler Multicue dataset, and a new challenging dataset, called PobleSec, in which a considerable number of targets are partially occluded. The different approaches are evaluated at the classification and detection levels for both partially occluded and non-occluded data. The experimental results show that our detector outperforms state-of-the-art approaches in the presence of partial occlusions, while offering performance and reliability similar to those of the holistic approach on non-occluded data. The datasets used in our experiments have been made publicly available for benchmarking purposes.

### **31. Predicting trait impressions of faces using local face recognition techniques**

The aim of this work is to propose a method for detecting the social meanings that people perceive in facial morphology using local face recognition techniques. Developing a reliable method to model people's trait impressions of faces has theoretical value in psychology and human-computer interaction. The first step in creating our system was to develop a solid ground truth. For this purpose, we collected a set of faces that exhibit strong human consensus within the bipolar extremes of the following six trait categories: intelligence, maturity, warmth, sociality, dominance, and trustworthiness. In the studies reported in this paper, we compare the performance of global face recognition techniques with local methods applying different classification systems. We find that the best performance is obtained using local techniques, where support vector machines or Levenberg-Marquardt neural networks are used as stand-alone classifiers. System performance in each trait dimension is compared using the area under the ROC curve. Our results show that not only are our proposed learning methods capable of predicting the social impressions elicited by facial morphology but they are also in some cases able to outperform individual human performances.

### **32. Fingerprint Compression Based on Sparse Representation**

A new fingerprint compression algorithm based on sparse representation is introduced. Obtaining an overcomplete dictionary from a set of fingerprint patches allows us to represent them as a sparse linear combination of dictionary atoms. In the algorithm, we first construct a dictionary for predefined fingerprint image patches. For a new given fingerprint images, represent its patches according to the dictionary by computing  $l_0$ -minimization and then quantize and encode the representation. In this paper, we consider the effect of various factors on compression results. Three groups of fingerprint images are tested. The experiments demonstrate that our algorithm is efficient compared with several competing compression techniques (JPEG, JPEG 2000, and WSQ), especially at high compression ratios. The experiments also illustrate that the proposed algorithm is robust to extract minutiae.

### **33. LBP-Based Edge-Texture Features for Object Recognition**

This paper proposes two sets of novel edge-texture features, Discriminative Robust Local Binary Pattern (DRLBP) and Ternary Pattern (DRLTP), for object recognition. By investigating the limitations of Local Binary Pattern (LBP), Local Ternary Pattern (LTP) and Robust LBP (RLBP), DRLBP and DRLTP are proposed as new features. They solve the problem of discrimination between a bright object against a dark background and vice-versa inherent in LBP and LTP. DRLBP also resolves the problem of RLBP whereby LBP codes and their complements in the same block are mapped to

#56, II Floor, Pushpagiri Complex, 17<sup>th</sup> Cross 8<sup>th</sup> Main, Opp Water Tank, Vijaynagar, Bangalore-560040.

Website: [www.citlprojects.com](http://www.citlprojects.com), Email ID: [citlprojectsieee@gmail.com](mailto:citlprojectsieee@gmail.com), [projects@citlindia.com](mailto:projects@citlindia.com)

MOB: 9886173099, Whatsapp: 9986709224, PH : 080 -23208045 / 23207367.

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

the same code. Furthermore, the proposed features retain contrast information necessary for proper representation of object contours that LBP, LTP, and RLBP discard. Our proposed features are tested on seven challenging data sets: INRIA Human, Caltech Pedestrian, UIUC Car, Caltech 101, Caltech 256, Brodatz, and KTH-TIPS2- a. Results demonstrate that the proposed features outperform the compared approaches on most data sets.

### 34. Image Denoising using Orthonormal Wavelet Transform with Stein Unbiased Risk Estimator

- De-noising plays a vital role in the field of the image preprocessing. It is often a necessary to be taken, before the image data is analyzed. It attempts to remove whatever noise is present and retains the significant information, regardless of the frequency contents of the signal. It is entirely different content and retains low frequency content. De-noising has to be performed to recover the useful information. In this process much concentration is spent on, how well the edges are preserved and how much of the noise granularity has been removed. In this paper I simulate the different thresholding techniques and compare them their PSNR. After simulation I can find that stein unbiased risk estimator is one of the best techniques for removing the noise from the image in terms of PSNR.

### 35. Combined DWT-DCT Digital Watermarking Technique Software Used for CTS of Bank.

For the faster clearing of cheques, a cheques truncation system is used. CTS of bank sends electronic cheque images to drawee branch for payment through the clearing house. It is normally believed that the system is safe and secure. However, the intruders may damage the data and can degrade the quality of cheque image or can duplicate cheque image. There is necessity of security and copyright protection. In this paper, "Combination of DWT-DCT Watermarking Technique Software Used for CTS of Bank" is discussed. By using combined DWTDCT digital watermarking technique software, it is implemented imperceptibility of watermark which are supported for copyright protection and security of cheque images.

### 36. BIOMETRIC AUTHENTICATION USING NEAR INFRARED IMAGES OF PALM DORSAL VEIN PATTERNS

This paper proposes an improved palm dorsal (back of hand) feature extraction algorithm for biometric personal authentication applications. The proposed method employs the existing database of near Infrared (IR) images of palm dorsal hand vein surface. The proposed system include: 1) Infrared palm dorsal images database collection; 2) Detection of Region of Interest (ROI); 3) Palm vein extraction by median filtering 4) Feature extraction using crossing number algorithm 5) Authentication using minutiae triangulation matching. The input image is segmented using an optimum thresholding algorithm. The knuckle points are used as key points for the image normalization and extraction of region of interest. The extracted ROI is processed to get the reliable vein pattern and features (minutiae) are extracted using crossing number algorithm. The scores for performing authentication are generated based on minutiae triangulation matching.

### 37. A Real Time Approach for Secure Text Transmission Using Video Cryptography

Image and video are the two most basic forms of transmitting information. With the help of Image and video encryption methods any particular set of images or videos can be transmitted without worrying about security. In the proposed paper a very simple and real time algorithm, using pixel mapping, is used for the encryption of the images which are the basic building blocks of any video file. In the proposed research paper the video is distributed into the photo frames using a matlab code and all the frames are sequentially stored. Each such frame contains a combination of red, blue and green layers. If we consider a pixel as an 8 bit value than each pixel has the value in the range of 0 to 255. In the proposed work for each frame two pixels situated at the top left and the bottom right

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

corner are modified so as to insert text in each image. After the completion of the pixel value changing all the images is placed in a sequential manner and then all the frames are cascaded for generation of the original video file with encryption. This new video is almost similar to the original video file with no changes visible to the naked eye.

### 38. Biometric authentication using near infrared images of palm dorsal vein patterns

This paper proposes an improved palm dorsal (back of hand) feature extraction algorithm for biometric personal authentication applications. The proposed method employs the existing database of near Infrared (IR) images of palm dorsal hand vein surface. The proposed system include: 1) Infrared palm dorsal images database collection; 2) Detection of Region of Interest (ROI); 3) Palm vein extraction by median filtering 4) Feature extraction using crossing number algorithm 5) Authentication using minutiae triangulation matching. The input image is segmented using an optimum thresholding algorithm. The knuckle points are used as key points for the image normalization and extraction of region of interest. The extracted ROI is processed to get the reliable vein pattern and features (minutiae) are extracted using crossing number algorithm. The scores for performing authentication are generated based on minutiae triangulation matching.

### 39. Reversible Data Hiding in Encrypted Images by Reserving Room Before Encryption

Recently, more and more attention is paid to reversible data hiding (RDH) in encrypted images, since it maintains the excellent property that the original cover can be losslessly recovered after embedded data is extracted while protecting the image content's confidentiality. All previous methods embed data by reversibly vacating room from the encrypted images, which may be subject to some errors on data extraction and/or image restoration. In this paper, we propose a novel method by reserving room before encryption with a traditional RDH algorithm, and thus it is easy for the data hider to reversibly embed data in the encrypted image. The proposed method can achieve real reversibility, that is, data extraction and image recovery are free of any error. Experiments show that this novel method can embed more than 10 times as large payloads for the same image quality as the previous methods, such as for PSNR dB.

### 40. A Robust Scheme for Digital Video Watermarking based on Scrambling of Watermark

The swift growth of communication networks has directed to situation that assists on-line e-commerce of digital properties. Subsequently, digital data holders can rapidly and immensely transfer multimedia contents athwart the Internet. This leads to broad curiosity in multimedia security and multimedia copyright protection. This paper proposes a robust scheme for digital video watermarking based on scrambling & then embedding the watermark into different parts of the source video according to its scene change. Proposed algorithm is robust against the various attacks like dropping of frame, averaging and collusion. The work is started with a comprehensive investigation of modern watermarking technologies, and perceived that none of the standing arrangements is proficient of resisting all the attacks. Hence, we propose the notion of embedding different fragments of a lone watermark into dissimilar scenes of a video. The efficiency of the scheme is tested over a sequence of research, in which a number of typical image processing attacks are tested, and the robustness of the scheme is revealed using the standards of the latest Stirmark test.

### 41. Image processing techniques for the enhancement of brain tumor patterns

Brain tumor analysis is done by doctors but its grading gives different conclusions which may vary from one doctor to another. So for the ease of doctors, a research was done which made the use of software with edge detection and segmentation methods, which gave the edge pattern and segment of brain and brain tumor itself. Medical image segmentation had been a vital point of research, as it inherited complex problems for the proper diagnosis of brain disorders. In this research, it provides a foundation of segmentation and edge detection, as the first step towards brain tumor grading. Current segmentation approaches are reviewed with an emphasis placed on revealing the

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

advantages and disadvantages of these methods for medical imaging applications. The use of image segmentation in different imaging modalities is also described along with the difficulties encountered in each modality.

### 42. Automatic retina exudates segmentation without a manually labeled training set

Diabetic macular edema (DME) is a common vision threatening complication of diabetic retinopathy which can be assessed by detecting exudates (a type of bright lesion) in fundus images. In this work, two new methods for the detection of exudates are presented which do not use a supervised learning step; therefore, they do not require labelled lesion training sets which are time consuming to create, difficult to obtain and prone to human error. We introduce a new dataset of fundus images from various ethnic groups and levels of DME which we have made publicly available. We evaluate our algorithm with this dataset and compare our results with two recent exudate segmentation algorithms. In all of our tests, our algorithms perform better or comparable with an order of magnitude reduction in computational time.

### 43. Local Edge-Preserving Multiscale Decomposition for High Dynamic Range Image Tone Mapping

Local energy pattern, a statistical histogram-based representation, is proposed for texture classification. First, we use normalized local-oriented energies to generate local feature vectors, which describe the local structures distinctively and are less sensitive to imaging conditions. Then, each local feature vector is quantized by self-adaptive quantization thresholds determined in the learning stage using histogram specification, and the quantized local feature vector is transformed to a number by N-nary coding, which helps to preserve more structure information during vector quantization. Finally, the frequency histogram is used as the representation feature. The performance is benchmarked by material categorization on KTH-TIPS and KTH-TIPS2-a databases. Our method is compared with typical statistical approaches, such as basic image features, local binary pattern (LBP), local ternary pattern, completed LBP, Weber local descriptor, and VZ algorithms (VZ-MR8 and VZ-Joint). The results show that our method is superior to other methods on the KTH-TIPS2-a database, and achieving competitive performance on the KTH-TIPS database. Furthermore, we extend the representation from static image to dynamic texture, and achieve favorable recognition results on the University of California at Los Angeles (UCLA) dynamic texture database.

### 44. Fuzzy C-Means Clustering With Local Information and Kernel Metric for Image Segmentation

In this paper, we present an improved fuzzy C-means (FCM) algorithm for image segmentation by introducing a tradeoff weighted fuzzy factor and a kernel metric. The tradeoff weighted fuzzy factor depends on the space distance of all neighboring pixels and their gray-level difference simultaneously. By using this factor, the new algorithm can accurately estimate the damping extent of neighboring pixels. In order to further enhance its robustness to noise and outliers, we introduce a kernel distance measure to its objective function. The new algorithm adaptively determines the kernel parameter by using a fast bandwidth selection rule based on the distance variance of all data points in the collection. Furthermore, the tradeoff weighted fuzzy factor and the kernel distance measure are both parameter free. Experimental results on synthetic and real images show that the new algorithm is effective and efficient, and is relatively independent of this type of noise.

### 45. Nonedge-Specific Adaptive Scheme for Highly Robust Blind Motion Deblurring of Natural Images

Blind motion deblurring estimates a sharp image from a motion blurred image without the knowledge of the blur kernel. Although significant progress has been made on tackling this problem, existing methods, when applied to highly diverse natural images, are still far from stable. This paper focuses on the robustness of blind motion deblurring methods toward image diversity—a critical problem that has been previously neglected for years. We classify the existing methods into two schemes and analyze their robustness using an image set consisting of 1.2 million natural images. The first scheme is edge-specific, as it relies on the detection and prediction of large-scale step edges. This scheme is sensitive to the diversity of the image edges in natural images. The second scheme is nonedge-specific and explores various image statistics, such as the prior distributions. This scheme is sensitive to statistical variation over different images. Based on

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing))

the analysis, we address the robustness by proposing a novel nonedge-specific adaptive scheme (NEAS), which features a new prior that is adaptive to the variety of textures in natural images. By comparing the performance of NEAS against the existing methods on a very large image set, we demonstrate its advance beyond the state-of-the-art.

### **46. Missing Texture Reconstruction Method Based on Error Reduction Algorithm Using Fourier Transform Magnitude Estimation Scheme**

A missing texture reconstruction method based on an error reduction (ER) algorithm, including a novel estimation scheme of Fourier transform magnitudes is presented in this brief. In our method, Fourier transform magnitude is estimated for a target patch including missing areas, and the missing intensities are estimated by retrieving its phase based on the ER algorithm. Specifically, by monitoring errors converged in the ER algorithm, known patches whose Fourier transform magnitudes are similar to that of the target patch are selected from the target image. In the second approach, the Fourier transform magnitude of the target patch is estimated from those of the selected known patches and their corresponding errors. Consequently, by using the ER algorithm, we can estimate both the Fourier transform magnitudes and phases to reconstruct the missing areas.

### **47. Efficient Contrast Enhancement Using Adaptive Gamma Correction With Weighting Distribution**

This paper proposes an efficient method to modify histograms and enhance contrast in digital images. Enhancement plays a significant role in digital image processing, computer vision, and pattern recognition. We present an automatic transformation technique that improves the brightness of dimmed images via the gamma correction and probability distribution of luminance pixels. To enhance video, the proposed image enhancement method uses temporal information regarding the differences between each frame to reduce computational complexity. Experimental results demonstrate that the proposed method produces enhanced images of comparable or higher quality than those produced using previous state-of-the-art methods. Index Terms—Contrast enhancement, gamma correction, histogram equalization, histogram modification

### **48. Unified Blind Method for Multi-Image Super-Resolution and Single/Multi-Image Blur Deconvolution**

This paper presents, for the first time, a unified blind method for multi-image super-resolution (MISR or SR), single-image blur deconvolution (SIBD), and multi-image blur deconvolution (MIBD) of low-resolution (LR) images degraded by linear space-invariant (LSI) blur, aliasing, and additive white Gaussian noise (AWGN). The proposed approach is based on alternating minimization (AM) of a new cost function with respect to the unknown high-resolution (HR) image and blurs. The regularization term for the HR image is based upon the Huber-Markov random field (HMRF) model, which is a type of variational integral that exploits the piecewise smooth nature of the HR image. The blur estimation process is supported by an edge-emphasizing smoothing operation, which improves the quality of blur estimates by enhancing strong soft edges toward step edges, while filtering out weak structures. The parameters are updated gradually so that the number of salient edges used for blur estimation increases at each iteration. For better performance, the blur estimation is done in the filter domain rather than the pixel domain, i.e., using the gradients of the LR and HR images. The regularization term for the blur is Gaussian (L2 norm), which allows for fast noniterative optimization in the frequency domain. We accelerate the processing time of SR reconstruction by separating the upsampling and registration processes from the optimization procedure. Simulation results on both synthetic and real-life images (from a novel computational imager) confirm the robustness and effectiveness of the proposed method.

### **49. Colorization-Based Compression Using Optimization**

In this paper, we formulate the colorization-based coding problem into an optimization problem, i.e., an L1 minimization problem. In colorization-based coding, the encoder chooses a few representative pixels (RP) for which the chrominance

## **MATLAB PROJECT ABSTRACTS**

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

values and the positions are sent to the decoder, whereas in the decoder, the chrominance values for all the pixels are reconstructed by colorization methods. The main issue in colorization-based coding is how to extract the RP well therefore the compression rate and the quality of the reconstructed color image becomes good. By formulating the colorization-based coding into an L1 minimization problem, it is guaranteed that, given the colorization matrix, the chosen set of RP becomes the optimal set in the sense that it minimizes the error between the original and the reconstructed color image. In other words, for a fixed error value and a given colorization matrix, the chosen set of RP is the smallest set possible. We also propose a method to construct the colorization matrix that colorizes the image in a multiscale manner. This, combined with the proposed RP extraction method, allows us to choose a very small set of RP. It is shown experimentally

### **50. Texture Enhanced Histogram Equalization Using TV-L1 Image Decomposition**

Histogram transformation defines a class of image processing operations that are widely applied in the implementation of data normalization algorithms. In this paper, we present a new variational approach for image enhancement that is constructed to alleviate the intensity saturation effects that are introduced by standard contrast enhancement (CE) methods based on histogram equalization. In this paper, we initially apply total variation (TV) minimization with a L1 fidelity term to decompose the input image with respect to cartoon and texture components. Contrary to previous papers that rely solely on the information encompassed in the distribution of the intensity information, in this paper, the texture information is also employed to emphasize the contribution of the local textural features in the CE process. This is achieved by implementing a nonlinear histogram warping CE strategy that is able to maximize the information content in the transformed image. Our experimental study addresses the CE of a wide variety of image data and comparative evaluations are provided to illustrate that our method produces better results than conventional CE strategies.

### **51. Fusion of Multifocus Images to Maximize Image Information**

When an image of a 3-D scene is captured, only scene parts at the focus plane appear sharp. Scene parts in front of or behind the focus plane appear blurred. In order to create an image where all scene parts appear sharp, it is necessary to capture images of the scene at different focus levels and fuse the images. In this paper, first registration of multifocus images is discussed and then an algorithm to fuse the registered images is described. The algorithm divides the image domain into uniform blocks and for each block identifies the image with the highest contrast. The images selected in this manner are then locally blended to create an image that has overall maximum contrast. Examples demonstrating registration and fusion of multifocus images are given and discussed.

### **52. Inception of Hybrid Wavelet Transform using Two Orthogonal Transforms and It's use for Image Compression**

The paper presents the novel hybrid wavelet transform generation technique using two orthogonal transforms. The orthogonal transforms are used for analysis of global properties of the data into frequency domain. For studying the local properties of the signal, the concept of wavelet transform is introduced, where the mother wavelet function gives the global properties of the signal and wavelet basis functions which are compressed versions of mother wavelet are used to study the local properties of the signal. In wavelets of some orthogonal transforms the global characteristics of the data are hauled out better and some orthogonal transforms might give the local characteristics in better way. The idea of hybrid wavelet transform comes in to picture in view of combining the traits of two different orthogonal transform wavelets to exploit the strengths of both the transform wavelets.

### **53. A New DCT-based Multiresolution Method for Simultaneous Denoising and Fusion of SAR Images**

Individual multiresolution techniques for separate image fusion and denoising have been widely researched. We propose a novel multiresolution Discrete Cosine Transform based method for simultaneous image denoising and fusion, demonstrating its efficacy with respect to Discrete Wavelet Transform and Dual- tree complex Wavelet Transform. We

## MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

incorporate the Laplacian pyramid transform multiresolution analysis and a sliding window Discrete Cosine Transform for simultaneous denoising and fusion of the multiresolution coefficients. The impact of image denoising on the results of fusion is demonstrated and advantages of simultaneous denoising and fusion for SAR images are also presented

### 54. Brain Segmentation using Fuzzy C means clustering to detect tumour Region

Tumor Segmentation from MRI data is an important but time consuming manual task performed by medical experts.

The research which addresses the diseases of the brain in the field of the vision by computer is one of the challenges in recent times in medicine, the engineers and researchers recently launched challenges to carryout innovations of technology pointed in imagery. This paper focuses on a new algorithm for brain segmentation of MRI images by fuzzy C means algorithm to diagnose accurately the region of cancer. In the first step it proceeds by noise filtering later applying FCM algorithm to segment only tumor area. In this research multiple MRI images of brain can be applied detection of glioma (tumor) growth by advanced diameter technique

### 55. Efficient image compression technique using full, column and row transforms on colour image

This paper presents image compression technique based on column transform, row transform and full transform of an image. Different transforms like, DFT, DCT, Walsh, Haar, DST, Kekre's Transform and Slant transform are applied on colour images of size 256x256x8 by separating R, G, and B colour planes. These transforms are applied in three different ways namely: column, row and full transform. From each transformed image, specific number of low energy coefficients is eliminated and compressed images are reconstructed by applying inverse transform. Root Mean Square Error (RMSE) between original image and compressed image is calculated in each case. From the implementation of proposed technique it has been observed that, RMSE values and visual quality of images obtained by column transform are closer to RMSE values given by full transform of images. Row transform gives quite high RMSE values as compared to column and full transform at higher compression ratio. Aim of the proposed technique is to achieve compression with acceptable image quality and lesser computations by using column transform.

### 56. Grading of rice grains by image processing

The purpose of this paper is grading of rice grains by image processing technique. Commercially the grading of rice is done according to the size of the grain kernel (full, half or broken). The food grain types and their quality are rapidly assessed through visual inspection by human inspectors. The decision making capabilities of human-inspectors are subjected to external influences such as fatigue, vengeance, bias etc. with the help of image processing we can overcome that. By image processing we can also identify any broken grains mixed . Here we discuss the various procedures used to obtain the percentage quality of rice grains.

### 57. Multi layer information hiding -a blend of steganography and visual cryptograph

This study combines the notion of both steganography [1] and visual cryptography [2]. Recently, a number of innovative algorithms have been proposed in the fields of steganography and visual cryptography with the goals of improving security, reliability, and efficiency; because there will be always new kinds of threats in the field of information hiding. Actually Steganography and visual cryptography are two sides of a coin. Visual cryptography has the problem of revealing the existence of the hidden data where as Steganography hides the existence of hidden data. Here this study is to suggest multiple layers of encryption by hiding the hidden data. Hiding the hidden data means, first encrypting the information using visual cryptography and then hide the share/s[3] into images or audio files using steganography. The proposed system can be less of draw backs and can resist towards attacks

### 58. Quality Evaluation of Rice Grains Using Morphological Methods

#56, II Floor, Pushpagiri Complex, 17<sup>th</sup> Cross 8<sup>th</sup> Main, Opp Water Tank,Vijaynagar,Bangalore-560040.

Website: [www.citlprojects.com](http://www.citlprojects.com), Email ID: [citlprojectsieee@gmail.com](mailto:citlprojectsieee@gmail.com), [projects@citlindia.com](mailto:projects@citlindia.com)

MOB: 9886173099, Whatsapp: 9986709224, PH : 080 -23208045 / 23207367.

## **MATLAB PROJECT ABSTRACTS**

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

In this paper we present an automatic evaluation method for the determination of the quality of milled rice. Among the milled rice samples the quantity of broken kernels are determined with the help of shape descriptors, and geometric features. Grains are said to be broken kernels whose lengths are 75% of the grain size. This proposed method gives good results in evaluation of rice quality