



(1)

Exponential Spline Perfect Reconstruction Decomposition with Applications in Compression and De-noising

M. F. Fahmy, and G. Fahmy

Abstract:

B-splines caught interest of many engineering applications due to their merits of being flexible and provide a large degree of differentiability and cost/quality trade off relationship. However they have less impact with continuous time applications as they are constructed from piecewise polynomials. On the other hand, Exponential spline polynomials (E-splines) represent the best smooth transition between continuous and discrete domains as they are made of exponential segments. In this paper we present a complete analysis for an E-spline based subband coding (wavelet) perfect reconstruction (PR) system. Derivations for the scaling and wavelet functions are presented, along with application of the proposed system in image compression and image denoising. In image compression, a comparison of the proposed technique compared with the B-spline based PR system as well as the basic wavelet subband system with the SPIHT image codec, is presented. In image denoising, we report the enhancement achieved with the proposed E-spline based denoising approach compared with B-spline based denoising and another basic denoising technique. In both applications, E-splines show superior performance as will be illustrated.

Keywords:

Cardinal Exponential Splines, Image Compression, Image De noising

Published In:

Journal of Signal, Image and Video Processing Springer, Volume 8, Issue 6 (2014), pp. 1111-1120. , Volume 8, Issue 6 (2014) , 1111-1120



(2)

Integer DCT convergence for JPEG-75 forensics for images

G. Fahmy

Abstract:

Many forensic techniques recently tried to detect the tampering and manipulation of JPEG compressed images that became a critical problem in image authentication and origin tracking. Some techniques indicated that a knowledgeable attacker can make it very hard to trace the image origin, while others indicated that portions of the compressed image that has been compressed at different quality factor quantization matrices are distinguishable if they are re-compressed at a higher quality factor quantization matrix (with less quantization steps). In this paper we propose the idea of adopting Integer DCT (ICT) as an implementation technique that can be utilized in the detection of any hacking or tampering of JPEG/ICT compressed images. The proposed approach is based upon recent literature ideas of recompressing JPEG image blocks and detecting if this block has been compressed/touched before or not. We also propose an ICT implementation that has a onetime signature on processed coefficients or pixels and can be used as a tool to detect if this block has been compressed before using the proposed implementation or not. We finally propose to re-compress images originally compressed with ICT but with a different quantization matrix as a different compression parameter to analysis and detect more forgeries. Illustrative examples on several processed images are presented with complexity analysis.

Keywords:

image forensics, JPEG edits, IDCT Compression

Published In:

International Journal of Information Assurance and Security (JIAS) , ISSN 1554-1010 Volume 10 (2015) , pp. 080-088



(3)

Image super resolution and Enhancement using E-splines

G. Fahmy

Abstract:

E-splines (Exponential spline) polynomials represent the best smooth transition between continuous and discrete domains. As they are constructed from convolution of exponential segments, there are many degrees of freedom to optimally choose the most convenient E-spline, suitable for a specific application. In this paper, the parameters of these E-splines were optimally chosen, to enhance the performance of image zooming and interpolation schemes. The proposed technique is based on minimizing the total variation function of the detail coefficients of the E-spline based wavelet decomposition. In zooming applications, the quality of interpolated images are further improved and sharpened by applying ICA technique to them, in order to remove any dependency. Illustrative examples are given to verify image enhancement of the proposed E-spline scheme, when compared with the existing approaches.

Keywords:

Image de-noising, interpolators, E-spline functions

Published In:

Journal of Communications and Computers , 10 (2013) , 1497-1501



(4)

Joint Watermarking and Compression for Images in Transform domain

G. Fahmy

Abstract:

Image watermarking, authentication and encryption have gained an increased importance during the last decade. This is due to the widespread use of visual media over the Internet and in several digital media applications. Several watermarking techniques have been proposed, some in spatial domain, and more recently in the transform/frequency domain and have been reported to be robust against different attacks, namely compression. It is also well known the importance and effectiveness of compression techniques to store transmit and retrieve visual information. However, the creation or development of a joint watermarking and compression framework for images has yet to be explored, where watermarking and compression could be pursued jointly on a trade-off manner. In other words, watermarking embedding/extraction can be performed on compressed domain data, while compression parameters could be used as watermarking keys. The primary focus of this paper is to explore this novel/unique idea. We propose a joint watermarking and compression (JWC) technique in the transform domain. This transform domain is based on the Natural Preserve Transform and can be utilized to achieve a balance between watermarking and compression for visual information. Watermarking performance is evaluated blindly for different compressed domain data scenarios, while compression performance is analyzed for other watermarking cases. Extensive simulation results that demonstrate the efficiency of the proposed joint watermarking and compression technique are presented.

Keywords:

Image Watermarking, Natural Preserve Transform, Image Compression; Hartley Transform

Published In:

International Journal of Modern Engineering Research , vol.2, Issue.4, , pp-2341-2351



(5)

Shift variance behavior for different sub-band coding systems, Biorthogonal, Orthogonal and Bspline wavelets

G. Fahmy

Abstract:

Sub-band coding has long been utilized and adopted in different compression, coding and reconstruction techniques in most signal processing applications. It has wide applications in communications, bit rate codecs, sampling, and compression for images, videos and speech. However sub-band coding systems in general suffer from a certain amount of shift variance of the output reconstructed signal, due to the frequency overlap between different sub-bands in the analysis stage. This overlap is known as non-ideal anti-aliasing. In this paper we simplify the shift variance analysis of sub-band coding systems in general, and we present different metrics that have been reported in the literature to measure the bounds of shift variance for Perfect Reconstruction (PR) sub-band systems, we simplify its mathematical analysis and illustrate with graphs the reasons for these bounds and compare them. We apply these metrics on Biorthogonal, Orthogonal and Bspline wavelets and present the worst case scenario for different input signals in terms of shift variance for all these sub-band coding systems, both numerically and graphically. We finally compare the shift variance behavior for different sub-band PR systems for different types of input signals.

Keywords:

Shift variance, Bspline, multirate system

Published In:

International Journal of Modern Engineering Research , vol.2, Issue.4 , pp-2331-2340



(6)

Fast Multiplier-less Implementation of B-spline basis with enhanced compression performance

G. Fahmy

Abstract:

The Bspline mathematical functions have long been utilized for signal representation, zooming and interpolation. In this paper we propose a novel technique for preprocessing signals/images prior to the decomposition stage in different image coders based on the Bspline decomposition for enhanced compression performance. Bspline coefficients have been traditionally calculated through inverse filtering using a causal/non-causal manner, which makes it non practical for online applications. More over Bsplines are known to be integer coefficients and representations as they are the exact mathematical translators between the discrete and continuous versions of signals. In this paper we also propose a novel implementation technique for Bspline coefficient calculation. This technique is based on a straight forward calculation approach through a Toeplitz matrix that allows parallel processing for online applications. The proposed technique is also suitable for integer coefficients as in the Bspline case. Simulation results that demonstrate the effectiveness of the proposed techniques as well as complexity analysis are presented.

Keywords:

Bsplines, Compression, Multiplier-Less

Published In:

American Journal of Signal Processing , 1(1) , 6-11



(7)

B-splines Wavelets for Signal Denoising and Image Compression

M. F. Fahmy, G. Fahmy and O. F. Fahmy

Abstract:

In this paper we propose to develop novel techniques for signal/image decomposition, and reconstruction based on the B-spline mathematical functions. Our proposed B-spline based multiscale/resolution representation is based upon a perfect reconstruction analysis/synthesis point of view. Our proposed B-spline analysis can be utilized for different signal/imaging applications such as compression, prediction, and denoising. We also present a straightforward computationally efficient approach for B-spline basis calculations that is based upon matrix multiplication and avoids any extra generated basis. Then we propose a novel technique for enhanced B-spline based compression for different image coders by preprocessing the image prior to the decomposition stage in any image coder. This would reduce the amount of data correlation and would allow for more compression, as will be shown with our correlation metric. Extensive simulations that have been carried on the well known SPIHT image coder with and without the proposed correlation removal methodology are presented. Finally, we utilized our proposed B-spline basis for denoising and estimation applications. Illustrative results that demonstrate the efficiency of the proposed approaches are presented.

Keywords:

B-splines · Wavelets · Signal denoising · Image compression

Published In:

Journal of Signal, Image and Video Processing , Volume 5, Issue 2 (2011) , 141



(8)

Phase based detection of JPEG counter forensics

G. Fahmy, A. Alqallaf and R. Wurtz

Abstract:

Many recent techniques for forgery detection tried to counter noise dithering, which is considered to be the most successful technique for removing footprints of JPEG editing in countering forensics. In this paper we propose a novel idea of detecting any noise dithering that is typically adopted in removing footprints in counter anti forensics of images. This technique is based on detecting phase variations for DCT coefficients, for decoded JPEG images. We try to measure the level of coherence of phase values for coefficients and detect thresholded variations that would indicate some editing or tampering of images. The proposed technique is robust against noise dithering due to the fact that local homogeneous regions inherit distinctive phase values. These phase values are inconsistent with embedded or dithered noise signals that are considered to be out of phase and can be easily detected in noisy environments. Our proposed technique is compared with literature techniques for performance in noisy applications.

Keywords:

image forensics, JPEG edits, anti forensic

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IEEE-ICECS International Conference Communications, Electronics and Systems , NULL , NULL



(9)

Beyond Band limited Sampling - 60 years after Shannon

G. Fahmy

Abstract:

In this paper we present the topic of sampling of signals that are not band limited 60 years after the well known Shannon-Nyquist sampling theory. We consider the sampling process of several signals that were not exactly considered or treated by Shannon. We can call them non band limited signals. Research in sampling of non band limited signals is divided into two main categories. Signals that are sensed using modern state of the art compressive sensing techniques, and signals with a finite number of degrees of freedom that are sensed through sampling kernels that are physically realizable. These latter types of signals are typically called signals with finite rate of innovation. We present our results with these two main categories with different images and signals. Illustrative examples of the proposed techniques are presented.

Keywords:

NULL

Published In:

Journal of Engineering Sciences-University of Assiut , vol. 39, no. 3, May 2011 , NULL



(10)

Single Image Super-resolution using E-spline Functions

G. Fahmy

Abstract:

Single image super resolution has become an important topic in many imaging applications especially that it has a more constrained environment than regular multi image super resolution. In this paper we propose a novel single image super resolution technique that can significantly enhance a single image based on local data and statistics without a need for any prior information. The proposed algorithm is based on injecting Laplacian energy in high frequency details and estimating missing information from matched other parts of the image. Interpolation and zooming are achieved for the initial low resolution image through Exponential spline (E-spline) interpolation followed by Independent Component Analysis (ICA) separation to enhance the quality of the final high resolution image. A detailed comparison between E-spline and B-spline interpolation for the output image as well as another comparison with recent literature techniques are presented. Further enhanced results with ICA processing are also demonstrated.

Keywords:

Super resolution, E-spline interpolators, single image super resolution

Published In:

IEEE International Symposium for Signal Processing and Information Technology, Abu Dhabi, Dec, 2015. , NULL , NULL



(11)

Nonorthogonal DCT block convergence for JPEG-75 forensics

G. Fahmy

Abstract:

Many forensic techniques recently tried to detect the tampering and manipulation of JPEG compressed images that became a critical problem in different imaging applications. Some techniques indicated that a knowledge able attacker can make it very hard to detect image tampering, while others indicated that portions of the compressed image that has been compressed at different compression parameters can be detected, if they are recompressed after changing some of these parameters. In this project, we pursue the idea of analyzing forensically suspect-able images to detect forgery. We study the effect of adopting Nonorthogonal Discrete Cosine Transform (NDCT) that is highly utilized in efficient media implementations, in detecting if different parts of the image have been modified. This is performed by measuring block convergence of different image parts and detecting its stability after recompressions.

Keywords:

image forensics, JPEG edits, anti-forensic

Published In:

IEEE International Symposium for Signal Processing and Information Technology, India, Dec, 2014. , NULL , NULL



(12)

B-Spline based Perfect Reconstruction of Non-band Limited Signals Through Noisy Sensors

G. Fahmy and M. Ihle

Abstract:

We consider the problem of sampling non band limited signals with a finite number of degrees of freedom such as non uniform splines or piecewise polynomials. These signals are typically called signals with finite rate of innovation (FRI). We propose a novel technique for perfectly reconstructing impulses of Diracs. These Diracs are our adopted non band limited signal and have been filtered specifically through a B-spline sampling kernel, and then been uniformly sampled with a period T . This B-spline sampling kernel has an impulse response that is similar to most linear acquisition sensors/devices. The novelty of our proposed approach lies in the fact it is robust in noisy environments, unlike many recent similar techniques, i.e. Dragotti et al.[1] that may provide faster implementation but are very delicate with any type of noise. Our technique also does not have any restrictions on the number of perfectly reconstructed Diracs with respect to the sampling kernel order and achieves its reconstruction in a B-spline 2-channel perfect reconstruction (PR) framework. A comparison of our proposed B-spline based perfect reconstruction system with the recent technique given in [1], in terms of speed, complexity, and kernel order complexity, is provided.

Keywords:

Diracs, FRI polynomials, B-splines

Published In:

IEEE International Symposium for Signal Processing and Information Technology, Athens, Dec, 2013 , NULL , NULL



(13)

E-spline Based Image Interpolators

M.F. Fahmy, G. Fahmy, and O. F. Fahmy

Abstract:

Exponential spline polynomials (E-splines) represent the best smooth transition between continuous and discrete domains. As they are constructed from convolution of exponential segments, there are many degrees of freedom to optimally choose the most convenient E-spline; suitable for a specific application. In this paper, the parameters of these Esplines are optimally chosen, to sharpen the performance of an interpolated high resolution systems HR derived from a given low resolution decimated one whether noisy or noiseless. The proposed technique is based on minimizing the aliasing effects due to the high frequency bands of the HR images. Illustrative examples are given to verify image enhancement of the proposed E-spline scheme, when compared with the existing approaches.

Keywords:

Image de-noising, interpolators, E-spline functions

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IEEE International Symposium for Signal Processing and Information Technology, India, Dec, 2014 , NULL , NULL



(14)

Modified Efficient Fast Multiplication-Free Integer Transformation for the 2-D DCT H.265 Standard

M. N. Haggag, M. El-Sharkawy, and G. Fahmy

Abstract:

In this paper, efficient one-dimensional (1-D) fast integer transform algorithm of the DCT matrix for the H.265 standard is proposed. Based on the symmetric property of the integer transform matrix and the matrix operations, along with using the dyadic symmetry modification on the standard matrix, the efficient fast 1-D integer transform algorithm is developed. Therefore, the computational complexities of the proposed fast integer transform are smaller than those of the direct method. In addition to computational complexity reduction the proposed algorithms provides transformation quality improvement. With lower complexity and better transformation quality, the proposed fast algorithm is suitable to accelerate the quality-demanding video coding computations

Keywords:

NULL

Published In:

Journal of Software Engineering and Applications, vol. 3, no. 8 , August 2010 , NULL , NULL



(15)

Nonblind and Quasiblind Natural Preserve Transform Watermarking

G. Fahmy, M. F. Fahmy and U. S. Mohamed

Abstract:

This paper describes a new image watermarking technique based on the Natural Preserving Transform (NPT). The proposed watermarking scheme uses NPT to encode a gray scale watermarking logo image or text, into a host image at any location. NPT brings a unique feature which is uniformly distributing the logo across the host image in an imperceptible manner. The contribution of this paper lies in presenting two efficient non-blind and quasi-blind watermark extraction techniques. In the quasi blind case, the extraction algorithm requires little information about the original image that is already conveyed by the watermarked image. Moreover, the proposed scheme does not introduce visual quality degradation into the host image while still being able to extract a logo with a relatively large amount of data. The performance and robustness of the proposed technique are tested by applying common image-processing operations such as cropping, noise degradation, and compression. A quantitative measure is proposed to objectify performance; under this measure, the proposed technique outperforms most of the recent techniques in most cases. We also implemented the proposed technique on a hardware platform, digital signal processor (DSK 6713). Results are illustrated to show the effectiveness of the proposed technique, in different noisy environments.

Keywords:

NULL

Published In:

EURASIP Journal of advances on Signal Processing, volume 2010, ID. 452548 , NULL , NULL



(16)

Texture Characterization for Joint Compression and Classification Based on Human Perception

G. Fahmy, J. Black and S. Panchanathan

Abstract:

Today's multimedia applications demand sophisticated compression and classification techniques in order to store, transmit, and retrieve audio-visual information efficiently. Over the last decade, perceptually based image compression methods have been gaining importance. These methods take into account the abilities (and the limitations) of human visual perception (HVP) when performing compression. The upcoming MPEG 7 standard also addresses the need for succinct classification and indexing of visual content for efficient retrieval. However, there has been no research that has attempted to exploit the characteristics of the human visual system to perform both compression and classification jointly. One area of HVP that has unexplored potential for joint compression and classification is spatial frequency perception. Spatial frequency content that is perceived by humans can be characterized in terms of three parameters, which are: 1) magnitude; 2) phase; and 3) orientation. While the magnitude of spatial frequency content has been exploited in several existing image compression techniques, the novel contribution of this paper is its focus on the use of phase coherence for joint compression and classification in the wavelet domain. Specifically, this paper describes a human visual system-based method for measuring the degree to which an image contains coherent (perceptible) phase information, and then exploits that information to provide joint compression and classification. Simulation results that demonstrate the efficiency of this method are presented.

Keywords:

NULL

Published In:

IEEE Transactions on Image Processing, vol. 16, pp. 1389-1696 June 2006 , NULL , NULL



(17)

Teeth Segmentation in Digitized Dental X-Ray Films using Mathematical Morphology

Eyad Haj Said, Diaa M. Nassar, G. Fahmy and Hany Ammar

Abstract:

Automating the process of postmortem identification of individuals using dental records is receiving increased attention. Teeth segmentation from dental radiographic films is an essential step for achieving highly automated postmortem identification. In this paper, we offer a mathematical morphology approach to the problem of teeth segmentation. We also propose a grayscale contrast stretching transformation to improve the performance of teeth segmentation. We compare and contrast our approach with other approaches proposed in the literature based on a theoretical and empirical basis. The results show that in addition to its capability of handling bitewing and periapical dental radiographic views, our approach exhibits the lowest failure rate among all approaches studied.

Keywords:

NULL

Published In:

IEEE Transactions for security and information forensics, vol. 1, pp. 178-189, June 2006 , NULL , NULL



(18)

Towards an Automated Dental Identification System (ADIS)

G. Fahmy, D. Nassar, E. Haj-Said, H. Chen, O. Nomir, J. Zhou, R. Howell, H. Ammar, M. Abdel-Mottaleb and A. Jain

Abstract:

Forensic odontology has long been carried out by forensic experts of law enforcement agencies for postmortem identification. We address the problem of developing an automated system for postmortem identification using dental records (dental radiographs). This automated dental identification system (ADIS) can be used by law enforcement agencies as well as military agencies throughout the United States to locate missing persons using databases of dental x rays of human remains and dental scans of missing or wanted persons. Currently, this search and identification process is carried out manually, which makes it very time-consuming in mass disasters. We propose a novel architecture for ADIS, define the functionality of its components, and describe the techniques used in realizing these components. We also present the performance of each of these components using a database of dental images.

Keywords:

NULL

Published In:

Journal of Electronic Imaging, vol. 14.issue 4, 043018, December 2005. , NULL , NULL



(19)

A Lifting Based System for Compression and Classification trade off in the JPEG2000 framework

G. Fahmy, S. Panchanathan

Abstract:

In this paper, we propose a novel design for a lifting based wavelet system that achieves the optimal trade off between compression and classification performances. In addition, it can also achieve a superior compression performance compared to existing wavelet kernels. The proposed system is based on bi-orthogonal filters and can operate in a scalable compression framework. In the proposed system, the trade off point between compression and classification is determined by the system, however the user can also fine-tune the relative performance using two controllers (one for compression and one for classification). Extensive simulations have been performed to demonstrate the superior compression and/or classification performance of our system in the context of the recent image compression standard, namely (JPEG2000). Our simulation result shows that the lifting based kernels, generated from the proposed system, are capable of achieving superior compression performance compared to the default kernels adopted in the JPEG2000 standard (with a classification rate of 70%). The generated kernels can also achieve a comparable compression quality with the JPEG2000 kernels whilst also provide a 99% classification rate. In other words the proposed lifting based system achieves the trade off between compression and classification performance in the wavelet domain.

Keywords:

NULL

Published In:

Journal of Visual Communication and Image Representation, vol. 15, issue 2, pp. 145-162, June 2004 , NULL , NULL



(20)

Image Enhancement using E-spline Functions

M. F. Fahmy, G. Fahmy and O. F. Fahmy

Abstract:

Exponential spline polynomials (E-splines) represent the best smooth transition between continuous and discrete domains. As they are constructed from convolution of exponential segments, there are many degrees of freedom to optimally choose the most convenient E-spline, suitable for a specific application. In this paper, the parameters of these Esplines were optimally chosen, to enhance the performance of image de-noising as well as image zooming schemes. The proposed technique is based on minimizing the total variation function of the detail coefficients of the E-spline based wavelet decomposition. In image de-noising schemes, apart from Espline parameter estimations, the thresholding levels of their detail coefficients, are also optimally chosen. In zooming applications, the quality of interpolated images are further improved and sharpened by applying ICA technique to them, in order to remove any dependency. Illustrative examples are given to verify image enhancement of the proposed e-spline scheme, when compared with the existing approaches.

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, Athens, Dec, 2013 , NULL , NULL



(21)

E-spline Analysis for De-noising and Wavelet Compression Applications

M. F. Fahmy, and G. Fahmy

Abstract:

B-splines caught interest of many engineering applications due to their merits of being flexible and provide a large degree of differentiability and cost/quality trade off relationship. However they have less impact with continuous time applications as they are constructed from piecewise polynomials. On the other hand, Exponential spline polynomials (E-splines) represent the best smooth transition between continuous and discrete domains as they are made of exponential segments. In this paper we present a technique for utilizing E-splines in image compression and de-noising applications. This technique is based upon sub-band decomposition of the image through an E-spline based perfect reconstruction (PR) system. Different thresholdings are applied on the decomposition layers for de-noising purposes. Due to the selective nature of E-spline based decomposition, the performance of our E-spline based de-noising technique outperforms all other literature techniques.

Keywords:

NULL

Published In:

IEEE EuroCon 2013 conference, Zagreb July 2013 , NULL , NULL



(22)

E-spline in Image De-noising Applications

M. F. Fahmy, G. Fahmy and T. Alkanhal

Abstract:

B-splines caught interest of many engineering applications due to their merits of being flexible and provide a large degree of differentiability and cost/quality trade off relationship. However they have less impact with continuous time applications as they are constructed from piecewise polynomials. On the other hand, Exponential spline polynomials (E-splines) represent the best smooth transition between continuous and discrete domains as they are made of exponential segments. In this paper we present a technique for utilizing E-splines in image de-noising applications. This technique is based upon sub-band decomposition of the image through an E-spline based perfect reconstruction (PR) system. Different thresholdings are applied on the decomposition layers for de-noising purposes. Due to the selective nature of E-spline based decomposition, the performance of our E-spline based de-noising technique outperforms all other literature techniques.

Keywords:

NULL

Published In:

IEEE-National Radio Conference, Institute of Telecommunication, Cairo, Egypt, April 2013 , NULL , NULL



(23)

Detectable Tampering of JPEG Anti Forensics

G. Fahmy

Abstract:

Many forensic techniques recently tried to detect the tampering and manipulation of JPEG compressed images that became a critical problem in image authentication and origin tracking. Some techniques indicated that a knowledgeable attacker can make it very hard to trace the image origin, while others indicated that portions of the compressed image that has been compressed at different quality factor quantization matrices are distinguishable if they are recompressed at a higher quality factor quantization matrix (with less quantization steps). In this paper, we pursue the idea of recompressing forensically suspect-able images with different compression parameters. We use different quantization matrix sizes that would indicate a DCT projection at different frequencies (horizontally, vertically, and diagonally), and would make it easier to track any tampering or hacking footprints. We show that a JPEG compressed image can make these footprints distinguishable if recompressed with a smaller size quantization matrix. Illustrative examples are presented.

Keywords:

NULL

Published In:

National Workshop for information assurance, King Saud University, April 2012 , NULL , NULL



(24)

Image Compression using Exponential B-spline functions

M. F. Fahmy, and G. Fahmy

Abstract:

Exponential B-spline functions are more flexible than cardinal B-spline polynomials due to the extra degrees of freedom inherited by the arbitrary choice of its parameters. In this paper, independent simple proofs of some of the important features of Exponential B-spline functions are given. A novel efficient technique has also been proposed for decomposing a signal in terms of its exponential B-spline expansion. Applications of Exponential B-spline functions in spatial image compression are demonstrated. Our illustrative results show that Exponential B-splines outperform cardinal B-splines in image compression.

Keywords:

NULL

Published In:

IEEE- National Radio Conference, Cairo Univ., April 2012 , NULL , NULL



(25)

An interactive super resolution coding approach of images and videos for enhanced user visualization

G. Fahmy

Abstract:

In this paper we propose an interactive super resolution coding technique to enhance user's visualization of received low resolution (LR) images. The proposed technique hides/embeds high frequencies and edges in the LR image, and constructs a high resolution (HR) image upon a user click. The proposed technique is suitable for many applications (eg. digital libraries) that display images and videos to the user in small sizes, and should be capable of reconstructing a HR version of the image or video upon a click on the LR version. The proposed approach consists of an insertion part and an extraction part. In the insertion part (that could be treated as an acquisition algorithm), high frequency components of the sensed image are embedded/inserted among the content of the finally delivered LR image in an invisible manner. The resulting sensed image is a regular low resolution image, however when performing the extraction part on it, a HR image is constructed without any side information in a blind, fast, robust and effective manner. The proposed approach has been tested on several images and video sequences against noise and compression, and gave very competitive results with current literature methods.

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Spain, Dec. 2011 , NULL ,
NULL



(26)

NONORTHOGONAL DCT IMPLEMENTATION FOR JPEG FORENSICS

G. Fahmy

Abstract:

The detection of JPEG prior compression has become an essential task in the detection of forgery in image forensics. In this paper we propose a novel DCT implementation technique that can be utilized in the detection of any hacking or tampering of JPEG/DCT compressed images. The proposed approach is based upon recent literature ideas of recompressing JPEG image blocks and detecting if this block has been compressed before or not and how many times. In this paper we proposed a DCT implementation that has a onetime signature on processed coefficients or pixels and can be used as a tool to detect if this block has been compressed before using the proposed implementation or not. Any further processing can be easily detected and identified. The proposed DCT transformation is nonorthogonal and results in a minor amount of error due to this nonorthogonality, however it maintains an excellent tradeoff between compression performance, and transform error. Illustrative examples on several processed images are presented with complexity analysis.

Keywords:

NULL

Published In:

International Hybrid, Intelligence Systems Conference, Kuwait Dec. 2014 , NULL , NULL



(27)

A Novel Transform based Face Watermarking Approach for Security and Data Hiding Applications

G. Fahmy

Abstract:

In this paper we proposed a novel technique for watermarking facial images into different background images in an invisible manner. This facial image can be extracted blindly from the watermarked image without any prior knowledge about the background image (blindly). More over the proposed technique can still deliver an extracted face image even in the presence of noise, compression or cropping of the watermarked image, but with some visual quality degradation. This embedding/extraction methodology is fake-free and robust against compression, noise and cropping attacks. The proposed approach consists of an insertion part and an extraction part. The proposed approach is based upon the natural preserve transform technique that achieves a balance between energy concentration and energy distribution; hence it is best used for watermarking images. Extensive simulation results on several facial and background images, that demonstrate the effectiveness of the proposed technique, are illustrated in comparison with current watermarking methods in the literature.

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Luxor, Dec. 2010 , NULL ,
NULL



(28)

VC-1 Zero Block Detection Method in Motion Estimation Video Coding

H. Deghiedy, M. El-Sharkawy, and G. Fahmy

Abstract:

In this paper, we propose a VC-1 zero block detection method, for very low bit-rate applications that skip the transform operation for detected zero blocks. The proposed method works during the process of motion search for inter frame coding, by comparing the SAD of each residual block to two thresholds based on a value related to the QP, resulting in a two-option method for each threshold; where the 1st is for preserving quality, and the 2nd is for saving time. Normally VC-1 skips the quantization operation for detected zero blocks. In addition when a MB (macro-block) is detected as a zero MB, meaning that all 6 blocks in a MB are zeros; VC-1 signals this MB as a skipped MB, where it's treated differently and many processes are skipped on the MB layer. For that reason, the proposed method is enhanced again with skipping the transform operation, but for MBs with five zero blocks. Meaning that a 6th non-zero block in the MB will be a zero block, and the whole MB will then be signaled as a skipped MB. Loosing the information of the non-zero block, adds quality degradation, but compression takes place more effectively. Among the four sequences tested the Hall showed the best results with up to 73.55%, 78.00%, and 88.91% of the original file size, encoding, and decoding times respectively. On the other hand, the quality degraded, as was expected, with a maximum average PSNR by 5.3 dB for the Hall sequence and 3.4 dB in the Foreman sequence.

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Luxor, Dec.2010 , NULL , NULL



(29)

Efficient Fast Multiplication-Free Integer Transformation for the 2-D DCT H.265 Standard

M. N. Haggag, M. El-Sharkawy, and G. Fahmy

Abstract:

In this paper, efficient one-dimensional (1-D) fast integer transform algorithm of the DCT matrix for the H.265 standard is proposed. Based on the symmetric property of the integer transform matrix and the matrix operations, along with using the dyadic symmetry modification on the standard matrix, the efficient fast 1-D integer transform algorithm is developed. Therefore, the computational complexities of the proposed fast integer transform are smaller than those of the direct method. In addition to computational complexity reduction the proposed algorithms provides transformation quality improvement. With lower complexity and better transformation quality, the proposed fast algorithm is suitable to accelerate the quality-demanding video coding computations

Keywords:

NULL

Published In:

IEEE International Conference for Image Processing, ICIP 2010, Hong Kong , NULL , NULL



(30)

Enhanced Bspline based compression performance for images

G. Fahmy and T. Aach

Abstract:

The B-spline mathematical functions have long been utilized for signal representation, zooming and interpolation. However they have not been investigated for different image coding applications. In spite of the fact that B-splines are a semi-orthogonal basis (not full orthogonal) they still can be utilized for redundancy removal and decorrelation maximization prior to any compression scheme. This is due to their distinctive feature of preserving energy in low frequencies. In this paper we propose a novel technique for preprocessing signals/images prior to the decomposition stage in different image coders based on the B-spline decomposition. Mathematical explanation and derivation for the proposed B-spline decomposition basis is presented and analyzed. We derive our theoretic/mathematical justification, through some Eigen analysis calculations, for the enhancement in compression performance achieved with our B-spline based compression approach. We also present a straightforward approach for calculating the B-spline basis in a fast and efficient manner. Extensive simulations have been carried out on the well known SPIHT image coder with and without the proposed correlation removal methodology. Simulation results that demonstrate the effectiveness of the proposed technique are presented.

Keywords:

NULL

Published In:

IEEE International conference on Acoustics, Speech and Signal Processing, ICASSP, Dallas, March 2010 , NULL , NULL



(31)

A Quasi Blind Watermark Extraction of Watermarked Natural Preserve Transform Images on a DSP Board

G. Fahmy

Abstract:

The Natural Preserve Transform (NPT) has been presented as a tool for fuzzy logic watermarking. This paper describes a new image watermarking technique based on Naturalness Preserving Transform (NPT). The proposed watermarking scheme uses NPT to encode a gray scale watermarking logo image or text, into a host image at any location. This paper presents efficient non-blind and quasi-blind watermark extraction techniques. In the quasi blind case, the extraction algorithm requires only very few information about the original image that is already conveyed by the watermarked image. Moreover, the proposed scheme does not introduce visual quality degradation into the host image. The performance and robustness of the proposed technique are tested by applying common image-processing operations such as cropping, noise degradation, and image compression. A quantitative measure is proposed to objectify performance; under this measure, the proposed technique outperforms most of the recent techniques in most cases. We also implemented the proposed technique on a hardware platform, digital signal processor (DSK 6713). Simulation and implementation results are illustrated to show the effectiveness of the proposed technique.

Keywords:

NULL

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IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Ajman, UAE, Dec. 2009 , NULL , NULL



(32)

A Quasi Blind Watermark Extraction of Watermarked Natural Preserve Transform Image

M. F. Fahmy, O. M. Fahmy and G. Fahmy

Abstract:

The Natural Preserve Transform (NPT) has been presented as a tool for fuzzy logic watermarking. This paper describes a new image watermarking technique based on Naturalness Preserving Transform (NPT). The proposed watermarking scheme uses NPT to encode a gray scale watermarking logo image or text, into a host image at any location. This paper presents efficient non-blind and quasi-blind watermark extraction techniques. In the quasi blind case, the extraction algorithm requires only very few information about the original image that is already conveyed by the watermarked image. Moreover, the proposed scheme does not introduce visual quality degradation into the host image. The performance and robustness of the proposed technique are tested by applying common image-processing operations such as cropping, noise degradation, and image compression. A quantitative measure is proposed to objectify performance; under this measure, the proposed technique outperforms most of the recent techniques in most cases.

Keywords:

NULL

Published In:

IEEE International Conference on Image Processing, ICIP November 2009 , NULL , NULL



(33)

Bspline based Super-Resolution Construction of Textured Images

G. Fahmy

Abstract:

Super-Resolution image construction has gained increased importance recently. This is due to the demand for resolution enhancement for many imaging applications, as it is much efficient to capture images in a low resolution environment. The Bspline mathematical functions have long been utilized for signal representation. However they have been just recently been used for signal interpolation and zooming. This is due to the fact that they are flexible and provide the best cost/quality trade off relationship. In this paper we present a super-resolution image construction algorithm, where the high frequencies and edges of the high resolution constructed image are solely based on the Bspline signal representation. Mathematical explanation and derivation for the proposed Bspline prediction is analyzed. Several texture images from the Vistex database has been used to test the proposed technique. Extensive simulation results, that have been carried out with the proposed approach on different classes of images and demonstrated its usefulness, are proposed.

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, pp. 267-272, Cairo, Dec. 2007 ,
NULL , NULL



(34)

An Improved Watchdog Timer to Enhance Imaging System Reliability In The Presence Of Soft Errors

A. El-attar and G. Fahmy

Abstract:

Satellite and Ariel imaging systems are located at high altitudes. Thus, they are more vulnerable to Soft errors than similar systems operating at sea level. This paper studies the effect of transient faults on microprocessor based imaging systems. The paper studies the ability of different watchdog timer systems to recover the system from failure. A new improved watchdog timer system design is introduced. This new design solves the problems of both the standard and windowed watchdog timers. The watchdog timers are tested by injecting a fault while a processor is reading an image from RAM and sending it to the VGA RAM for display. This method is implemented on FPGA, and visually demonstrates the existence of fast watchdog resets, which can not be detected by standard watchdog timers, and faulty resets which occur undetected within the safe window of the windowed watchdog timers.

Keywords:

NULL

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IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, pp. 1116-11120, Cairo, Dec. 2007. , NULL , NULL



(35)

A Study of Fault Coverage of Standard and Windowed Watchdog Timers

A. El-attar, and G. Fahmy

Abstract:

Both standard and windowed watchdog timers were designed to detect flow faults and ensure the safe operation of the systems they supervise. This paper studies the effect of transient failures on microprocessors, and utilizes two methods to compare the fault coverage of both watchdog timers. The first method is injecting a fault while a processor is reading an image from RAM and sending it to the VGA RAM for display. This method is implemented on FPGA, and visually demonstrates the existence of fast watchdog resets which can not be detected by standard watchdog timers, and faulty resets which occur undetected within the safe window of the windowed watchdog timers. The second method is a simulation where the fault coverage for each watchdog timer system is calculated. This simulation tries to take into consideration many factors which could affect the outcome of this comparison.

Keywords:

NULL

Published In:

IEEE International Conference on Signal Processing and Communications, pp. 325-328, Dubai Nov. 2007 , NULL , NULL



(36)

Super-Resolution Construction of IRIS Images from a Visual Low Resolution Face Video

G. Fahmy

Abstract:

Iris became an important biometric in the last decade, due to its uniqueness and richness of features. In this paper, a novel super-resolution and image registration technique for visual (non-infra-red) iris images is presented. In the proposed technique a full face, 3 second long, 90 frames, visual video is captured with a digital camera located 3 feet away from each subject. Iris images are segmented from the full face image. A cross correlation model is applied for the registration/ alignment of full gray scale iris images. A high resolution iris image, that is 4 times higher in terms of size and resolution, is constructed from every 9 low resolution images. This process of building a high resolution image is based on an auto_regressive signature model between consecutive low resolution images in filling the sub pixels in the constructed high resolution image. Then this process is iterated until a 16 times higher resolution iris image is constructed. Illustrative images are shown that prove the effectiveness of the proposed technique.

Keywords:

NULL

Published In:

IEEE International Conference for Signal Processing and its applications, ISSPA 2007, WB-P4-4, Sharjah, UAE, Feb. 2007 ,
NULL , NULL



(37)

'A New Signal Compression Algorithm Using AllPass Extraction And Its Use In Image Compression And Coding

M. F. Fahmy and G. Fahmy

Abstract:

A new signal compression scheme is proposed. It is based on all pass extraction from the received signal's transfer function. The all pass parameters are closely related to a linear prediction polynomial LP of the same order, of the received data. Results have shown that, this new algorithm yields far smaller signal's reconstruction errors when compared with other known methods, for the same compression ratio CR. This algorithm is used in image compression and coding, as follows: First, the image is segmented into blocks and the 2-D DCT of each block, is computed. Next, each 2-D DCT matrix is zigzag scanned to yield a 1-D vector, which is subsequently compressed using the proposed scheme. The image is reconstructed in a reverse manner, using the compressed vectors. The image's compressed parameters is further compressed using schemes like EZW or SPHIT coders. Simulation results have revealed that the proposed compression scheme competes very well with JPEG compression schemes, especially when the images have many details.

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, pp. 91-94, Vancouver, August 2006 , NULL , NULL



(38)

The effect of lighting direction/condition on the performance of face recognition algorithms

30. G. Fahmy, A. Elsherbeeney, H. Ammar, S. Mandala, M. Abdel-Mottaleb

Abstract:

In this paper, we measure the effect of the lighting direction in facial images on the performance of 2 well-known face recognition algorithms, an appearance based method and a facial feature based method. We collect hundreds/thousands of facial images of subjects with a fixed pose and under different lighting conditions through a unique facial acquisition laboratory designed specifically for this purpose. Then we present a methodology for automatically detecting the lighting direction of different face images based on statistics derived from the image. We also detect if there is any glare regions in some lighting directions. Finally we determine the most reliable lighting direction that will lead to a good quality/high performance facial image from both techniques based on our experiments with the acquired data.

Keywords:

NULL

Published In:

SPIE Human Identification Conference (6202-21) April 2006 , NULL , NULL



(39)

Performance Evaluation of non-ideal IRIS Based Recognition System Implementing Global ICA Encoding

N. Schmid and Vivekanad Dorairaj and G.Fahmy

Abstract:

We describe and analyze the performance of a non-ideal iris recognition system. The system is designed to process non-ideal iris images in two steps: (i) estimation of the gaze direction and (ii) processing and encoding of the rotated iris image. We use two objective functions to estimate the gaze direction: Hamming distance and Daugman's integro-differential operator and determine an estimated angle by picking the value that optimizes the selected objective function. After the angle is estimated, the off-angle iris image undergoes geometric transformations involving the estimated angle and is further processed as if it were a frontal view image. The encoding technique developed in this work is based on application of the global Independent Component Analysis (ICA) to masked iris images. We use two datasets: CASIA dataset and a special dataset of offangle iris images collected at WVU to verify the performance of the encoding technique and angle estimator, respectively. A series of Receiver Operating Characteristics (ROCs) demonstrates various effects on the performance of the non-ideal iris based recognition system implementing the global ICA encoding.

Keywords:

NULL

Published In:

IEEE International Conference on Image Processing, pp. 285-288, Genova, Italy 2005. , NULL , NULL



(40)

Performance Evaluation of IRIS Based Recognition System Implementing Global ICA Encoding

N. Schmid and Vivekanad Dorairaj and G.Fahmy

Abstract:

In this paper, we describe and analyze the performance of two iris-encoding techniques. The first technique is based on Principle Component Analysis (PCA) encoding method while the second technique is a combination of Principal Component Analysis with Independent Component Analysis (ICA) following it. Both techniques are applied globally. PCA and ICA are two well known methods used to process a variety of data. Though PCA has been used as a preprocessing step that reduces dimensions for obtaining ICA components for iris, it has never been analyzed in depth as an individual encoding method. In practice PCA and ICA are known as methods that extract global and fine features, respectively. It is shown here that when PCA and ICA methods are used to encode iris images, one of the critical steps required to achieve a good performance is compensation for rotation effect. We further study the effect of varying the image resolution level on the performance of the two encoding methods. The major motivation for this study is the cases in practice where images of the same or different irises taken at different distances have to be compared. The performance of encoding techniques is analyzed using the CASIA dataset. The original images are non-ideal and thus require a sequence of preprocessing steps prior to application of encoding methods. We plot a series of Receiver Operating Characteristics (ROCs) to demonstrate various effects on the performance of the iris-based recognition system implementing PCA and ICA encoding techniques.

Keywords:

NULL

Published In:

SPIE Human identification conference, Proc SPIE 5779, pp. 51, April 2005. , NULL , NULL



(41)

Towards an Automated Dental Identification System (ADIS)system

34. G. Fahmy, D. Nassar, E. Haj-Said, H. Chen, O. Nomir, J. Zhou, R. Howell, H. Ammar, M. Abdel-Mottaleb and A. Jain

Abstract:

This paper addresses the problem of developing an automated system for postmortem identification using dental records. The Automated Dental Identification System (ADIS) can be used by law enforcement agencies to locate missing persons using databases of dental x-rays. Currently, this search and identification process is carried out manually, which makes it very time consuming and unreliable. In this paper, we propose an architecture for ADIS, we define the functionality of its components, and we briefly describe some of the techniques used in realizing these components.

Keywords:

NULL

Published In:

IEEE International Conference of Biometric Authenticity, pp. 789-796, Hong Kong 2004 , NULL , NULL



(42)

Modified Efficient Fast Multiplication-Free Integer Transformation for the 2-D DCT H.265 Standard system

M. N. Haggag, M. El-Sharkawy, and G. Fahmy

Abstract:

In this paper, efficient one-dimensional (1-D) fast integer transform algorithms of the DCT matrix for the H.265 standard are proposed. Based on the symmetric property of the integer transform matrix and the matrix operations, which denote the row/column permutations and the matrix decompositions, along with using the dyadic symmetry modification on the standard matrix, the efficient fast 1-D integer transform algorithms are developed. Therefore, the computational complexities of the proposed fast integer transform are smaller than those of the direct method. In addition to computational complexity reduction one of the proposed algorithms provides transformation quality improvement, while the other provides more computational complexity reduction while maintaining almost the same transformation quality.

Keywords:

NULL

Published In:

Data Compression Conference, Snowbird, UT, March 2011. , NULL , NULL



(43)

Texture Characterization for Joint Compression and Classification Based on Human Perception in the Wavelet Domain

G. Fahmy, J. Black and S. Panchanathan

Abstract:

Over the last decade perceptually based image compression has gained significant importance. This is because it relies on Human Visual Perception (HVP) in measuring the reconstruction quality in the compression process. as humans are the end users for images. Visual data that is perceived by humans can be characterized in terms of three parameters, Magnitude, Phase and Orientation of the spatial frequency content. While existing perceptually based image compression techniques exploits the first parameter, the novel contribution of this paper is its focus on the use of phase data for perceptually based texture compression. In this paper a HVS based texture characterization approach is applied to measure the perceived (by humans) phase coherence in the image. Then images are more compressed after removing the unperceived phase redundancy. Finally subjective tests are performed to measure the reconstruction quality of the proposed compression approach. The proposed compression algorithm has been applied in the JPEG2000 framework. Simulation results that demonstrate the efficiency of the proposed approach are presented.

Keywords:

NULL

Published In:

IEEE International Conference on Image Processing, pp. 2335-2338, Singapore, Sept. 2004 , NULL , NULL



(44)

A Lifting Based System for Optimal Compression and Classification in the JPEG2000 framework

G. Fahmy and S. Panchanathan

Abstract:

In this paper, we propose a novel design for a lifting based system that achieves the optimal trade off between compression and classification performances. In addition, it can also achieve superior compression performance compared to existing wavelet kernels. The proposed system is based on bi-orthogonal filters and can operate in the JPEG2000 framework. Typically, in our proposed system the trade off point between compression and classification is automatically determined by the system. However, the user can also fine-tune the relative performance if required using two adjusters (one for compression and one for classification). Extensive simulations have been performed to demonstrate the efficiency of OOT system. Our simulation result shows that a 99% classification performance can be achieved at a comparable reconstruction quality whilst a superior compression performance over the JPEG2000 standard can be achieved at a classification rate of 70%.

Keywords:

NULL

Published In:

Proc. IEEE International Symposium on Circuits and Systems (ISCAS 2002), pp. IV153- 156, Phoenix, AZ, May 2002. ,
NULL , NULL



(45)

A Joint Compression and Indexing Technique in Wavelet Compressed Domain

G. Fahmy, J. Bhalod and S. Panchanathan

Abstract:

The recent MPEG 4 and JPEG 2000 standards address the need for content based coding and manipulation of visual media. The upcoming MPEG 7 standard proposes content descriptors, which succinctly describe the visual content for the purpose of efficient retrieval. This implies that there is an impending need for efficient and effective joint compression and indexing approaches. Several compressed domain indexing techniques have been presented in the recent literature. These are based on the extraction of features from the compression parameters to derive the indices. However, there is little work in the domain of exploring the use of these features to serve the purposes of both compression and indexing. In this paper, we propose a new technique for joint compression and indexing in the wavelet domain. We note that wavelet based compression is used in JPEG 2000 and (for texture coding) in MPEG 4. In the proposed technique, the wavelet decomposed image is first preprocessed to extract features which are then used for compressing the image as well as for deriving the indices. Extensive simulations have been performed in the JPEG 2000 compressed domain to demonstrate the efficiency of the proposed technique.

Keywords:

NULL

Published In:

Proc. IEEE International Conference on Multimedia and Expo (ICME2001), pp. 249 -252, Tokyo, Japan, August 2001 ,
NULL , NULL



(46)

An efficient design algorithm of N-band IIR digital filters

Saleh, A.I.; Fahmy, M.F.; Raheem, G.A.; Fahmy, G.F.

Abstract:

NULL

Keywords:

NULL

Published In:

Radio Science Conference, 1998. NRSC '98. , NULL , NULL



(47)

Design of two channel IIR QMF filters with smooth wavelet functions

A. I. Saleh, M. F. Fahmy, G. M. Raheem and G. F. Fahmy

Abstract:

NULL

Keywords:

NULL

Published In:

Radio Science Conference, 1999. NRSC '99 , NULL , NULL



(48)

Prediction of the quality of JPEG-compressed color images based on the SCIELAB metric

G. Fahmy and L. Karam

Abstract:

NULL

Keywords:

NULL

Published In:

The Thirty-Fourth Asilomar Conference on , Volume: 2 , pp. 1054 -1057, 29 Oct.-1 Nov. 2000 , NULL , NULL



(49)

A lifting based system for optimal image compression in the wavelet domain

G. Fahmy and S. Panchanathan

Abstract:

NULL

Keywords:

NULL

Published In:

Proceedings. (ICASSP '02). IEEE International Conference on Acoustics, Speech, and Signal Processing, Volume: 4, pp. 4188-4189 May 2002 , NULL , NULL



(50)
Perceptual Indexing of Visual Information

G. Fahmy and S. Panchanathan

Abstract:

NULL

Keywords:

NULL

Published In:

Proc. Visual Communications and Image Processing 2002, Proc SPIE 4671 pp. 978, San Jose, CA, January 2002. , NULL ,
NULL



(51)
challenges of developing an Automated Dental Identification
System

Omaima Nomir, Mohamed Abdel-Mottaleb, Diao Eldin Nassar, G. Fahmy, and Hany H. Ammar

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE mid-west symposium on circuits and systems, pp. 411- 414, Cairo, Egypt, December 2003 , NULL , NULL



(52)

Dental X-Ray Image Segmentation

Eyad Haj Said, Diao Eldin M. Nassar, G. Fahmy and Hany H. Ammar

Abstract:

NULL

Keywords:

NULL

Published In:

SPIE Human identification conference, Proc SPIE 5404, pp. 409, April 2004. , NULL , NULL



(53)

Non-frontal/non-ideal iris localization and acquisition

G. Fahmy, L. Hornak, N. Schmid, X. Li and S. Schuckers

Abstract:

NULL

Keywords:

NULL

Published In:

SPIE ITCOM 2004 Philadelphia, Proc SPIE 5601 pp. 267, October 2004 , NULL , NULL



(54)

□A Fast B_SPLINE Based Algorithm for image zooming and compression□

M. F. Fahmy, T. K. Abdel Hameed and G. Fahmy

Abstract:

NULL

Keywords:

NULL

Published In:

24th National Radio Science Conference, pp. C-20(1-9), Ain Shams, Egypt, March 2007 , NULL , NULL



(55)

Signal Denoising and Image Compression Using Bspline Wavelets

Mamdouh F. Fahmy, Gamal F. Abdel Raheem, Osama S Mohammed, Omar F. Fahmy, G. Fahmy

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Sarajevo, Dec. 2008 , NULL , NULL



(56)

Bspline based Wavelets with Lifting Implementation

G. Fahmy

Abstract:

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Keywords:

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Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Sarajevo, Dec. 2008 , NULL ,
NULL



(57)

Watermarking via Bspline Expansion and Natural Preserving Transforms

M. Fahmy, G. Raheem, O. Mohammed, O. Fahmy and G. Fahmy

Abstract:

NULL

Keywords:

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Published In:

IEEE International Symposium for Signal Processing and Information Technology, ISSPIT, Sarajevo, Dec. 2008. , NULL ,
NULL



(58)

Natural preserving transform watermarking technique

M.F. Fahmy, G. Abdel Raheem, U. S. Mohamed+ , Omar F. Fahmy and G. F. Fahmy

Abstract:

NULL

Keywords:

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Published In:

26th National Radio Science Conference, C32, Future University, Egypt, March 2009 , NULL , NULL



(59)

□Modified Efficient Fast Multiplication-Free Integer Transformation for the 2-D DCT H.265 Standard□

M. N. Haggag, M. El-Sharkawy, and G. Fahmy

Abstract:

NULL

Keywords:

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Published In:

Data Compression Conference, Snowbird, UT, March 2011. , NULL , NULL



(60)

On the design on Biorthogonal filters

G. Fahmy, G. Raheem, M. Fahmy, A. Saleh

Abstract:

NULL

Keywords:

NULL

Published In:

International Journal for Circuit Theory and Applications, Volume 28, Issue 3, Date: May/June 2000, Pages: 209-224. ,
NULL , NULL



(61)

Content Based Indexing in the Wavelet Domain

J. Bhalod, G. Fahmy and S. Panchanathan

Abstract:

NULL

Keywords:

NULL

Published In:

Asian Journal of Information Technology vol. 2 (2): 109-122, 2003 , NULL , NULL