



(1)

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:

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Keywords:

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



(2)

Natural preserving transform watermarking technique

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

Abstract:

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Published In:

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



(3)

A new technique for blind source separation for post nonlinear mixture

M. F. Fahmy, U. S. Mohammed and N. A. Saleh

Abstract:

This paper presents a new method for solving post-nonlinear blind source separation (PNLBSS). It proposes a modified Gaussianization technique for recovering PNLBSS systems. The proposed technique overcomes the failure of classical Gaussianization schemes to work properly in some PNL mixture with severe nonlinearity characteristics. It is found that the failure is due to the multi-modality of the probability distributions (pdf), of the received nonlinear mixture. In order to estimate the received pdf, the paper proposes an accurate nonparametric evaluation of the pdf signal and its entropy functions. The pdf estimation is based on using B-spline wavelet transform as the smoothing filter for the data histogram distribution. The paper also proposes a pre-mapping scheme that transforms multi-modal pdf to a uni-modal one, and thereby makes them Gaussianable. Several illustrative examples are given, to verify the ability of the proposed technique to estimate pdf signal, recover PNLBSS mixture with severe nonlinearity characteristics.

Keywords:

Gaussian distribution; blind source separation; entropy; nonlinear filters; smoothing methods; splines (mathematics); wavelet transforms; B-spline wavelet transform; PNLBSS; PNLBSS system recovery; blind source separation; data histogram distribution; entropy function; modified Gaussianization technique; pdf estimation; post nonlinear mixture; probability distribution; smoothing filter

Published In:

Luxor, Egypt , ,



(4)

A Fast Iterative Blind Image Restoration Algorithm

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

Abstract:

A Fast Iterative Blind Image Restoration Algorithm Successful blind image deconvolution algorithms require the exact estimation of the Point Spread Function size, PSF. In the absence of any priori information about the imagery system and the true image, this estimation is normally done by trial and error experimentation, until an acceptable restored image quality is obtained. This paper, presents an exact estimation of the PSF size that yields the optimum restored image quality. The paper also describes a least squares PSF estimation, instead of the slow iterative update, that is commonly used in Iterative Blind Deconvolution software, IBD. Moreover, a technique is also proposed to improve the sharpness of the deconvolved images, by constrained maximization of the detail wavelet-coefficient entropies. Several simulations are given to verify these results.

Keywords:

Blind Image Deconvolution , Image Deblurring , Image Restoration

Published In:

Cairo, Egypt , ,



(5)

Image Compression Using Exponential B-spline Functionsalgorithm

M. F. Fahmy and G. F. 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:

Bspline Wavelets , Image Compression , Wavelets

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Cairo, Egypt , ,



(6)

A New Fast Iterative Blind Deconvolution Algorithm

M. F. Fahmy, G. M. A. Raheem, U. S. Mohammed, O. M. Fahmy

Abstract:

Successful blind image deconvolution algorithms require the exact estimation of the Point Spread Function size, PSF. In the absence of any priori information about the imagery system and the true image, this estimation is normally done by trial and error experimentation, until an acceptable restored image quality is obtained. This paper, presents an exact estimation of the PSF size, which yields the optimum restored image quality for both noisy and noiseless images. It is based on evaluating the detail energy of the wave packet decomposition of the blurred image. The minimum detail energies occur at the optimum PSF size. Having accurately estimated the PSF, the paper also proposes a fast double updating algorithm for improving the quality of the restored image. This is achieved by the least squares minimization of a system of linear equations that minimizes some error functions derived from the blurred image. Moreover, a technique is also proposed to improve the sharpness of the deconvolved images, by constrained maximization of some of the detail wavelet packet energies. Simulation results of several examples have verified that the proposed technique manages to yield a sharper image with higher PSNR than classical approaches.

Keywords:

Blind Image Deconvolution; Image Enhancement

Published In:

Signal & Information Processing (JSIP) , ,



(7)

An Enhanced Iterative Blind Deconvolution Algorithm

M. F. Fahmy, G. M. A. Raheem, U. S. Mohammed, O. M. Fahmy

Abstract:

Successful blind image deconvolution algorithms require the exact estimation of the Point Spread Function size, PSF. In the absence of any priori information about the imagery system and the true image, this estimation is normally done by trial and error experimentation, until an acceptable restored image quality is obtained. This paper, presents an exact estimation of the PSF size, for both noisy and noiseless images. It is based on evaluating the detail energy of the wave packet decomposition of the blurred image. The minimum detail energy occurs at the optimum PSF size. Having accurately estimated the PSF, the paper also proposes a fast double updating algorithm for improving the quality of the restored image, by the least squares minimization of a system of linear equations describing some peak error deviations derived from the blurred image. Extension to the noisy case has also been investigated. Simulation results of several examples are verified.

Keywords:

Blind image deconvolution , Total Variation , image enhancement

Published In:

TUWien, Vienna, Austria , ,



(8)

Design of fixed point state space digital filters with low round off noise

M. F. Fahmy, Y. M. Yassin, G. A. Raheem and Tarek I. Haweel

Abstract:

NULL

Keywords:

NULL

Published In:

International Journal of Circuit Theory and Applications , vol. 22 , 3-13



(9)

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



(10)

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

Published In:

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



(11)

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.

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



(12)

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.

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Published In:

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



(13)

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.

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



(14)

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.

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(15)

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:

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



(16)

An efficient design algorithm of N-band IIR digital filters

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

Abstract:

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Keywords:

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Published In:

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



(17)

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

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

Abstract:

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Keywords:

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Published In:

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



(18)
Signal Denoising and Image Compression Using Bspline
Wavelets

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

Abstract:

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NULL



(19)

Watermarking via Bspline Expansion and Natural Preserving Transforms

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

Abstract:

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NULL



(20)

On the design on Biorthogonal filters

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

Abstract:

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NULL , NULL