Identification aveugle 2D robuste à la surestimation de l'ordre

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Abstract
Dans cet article, une nouvelle technique pour l'identification aveugle d'un système à entrée unique et sorties multiples (SIMO : Single-Input Multiple-Outputs) est introduite dans le cadre de la restauration aveugle d'image. Dans un premier temps, une version simplifiée de la méthode des relations croisées (CR : Cross Relation) permettant de réaliser un bon compromis entre complexité numérique et performance d'estimation est introduite. Ensuite, dans le cas où l'ordre du canal est inconnu (surestimé), nous proposons d'identifier le système en cherchant parmi les solutions minimisant la fonction de coût CR, celle qui soit la plus parcimonieuse. Ceci résulte en une fonction de coût hybride combinant un terme de régularisation l_1 à la fonction objective de la méthode CR. Des résultats de simulation montrent que la méthode CR simplifiée (SCR) ainsi que sa version robuste (R-SCR) permettent d'atteindre les objectifs visés.

Keywords: *Identification aveugle du système, Défloutage d'image, Méthode des relations croisées symétrique, Algorithme SCR robuste, Représentation parcimonieuse.*

Approaches for automated detection and enhancement of microcalcifications in mammograms

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Abstract
Breast cancer continues to be a signicant public particularly in Algeria. The mammography is the technique of imagery of the breast that is widely used to screen for early detection of breast cancer. In this paper, we propose to use a system for the detection of calcifications, based on a new approach suggested for enhancement of mammography image. The latter is based on the suppression of noise (to decrease the noise to the maximum) by an anisotropic filtering in order to bring out all the spots (Clear Spots) possible to be calcifications; by using an operator of the Top-Hat transform. This hat is resulting from the mathematical morphology, and is used in this work as a first step, with the purpose of enhancing the contrast of microcalcification. The segmentation by the simple technique of Otsu [1] is then used in order to separate detected calcifications. Visually, the obtained results are very clear, and show the good performance of the new approach suggested in this work. This latter allows extracting successfully the calcifications starting from the mammography referents from the mini-MIAS database [1], and our database [2].

Keywords*: Calcification, Otsu, Top-Hat transform, anisotropic, Filtering.*

Evaluation of deterministic DTI-based tractography algorithms on diffusion MRI phantom and real data

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Abstract
This paper presents a comparative performance analysis of certain deterministic Diffusion Tensor Imaging (DTI) based tractography algorithm used in Diffusion Magnetic Resonance Imaging (dMRI). A dedicated software platform has been built for such study and the performance assessment is conducted using both dMRI phantom and real data. This evaluation reveals the limitations of the considered tracking algorithms particularly in crossing fibers area, and highlights the impact of the chosen tractography parameters on the performance accuracy. from the mini-MIAS database [1], and our database [2].

***Keywords**: Tractography, diffusion MRI, diffusion tensor imaging.*

ANN based method for delineation and classification of rainy clouds using MSG/SEVIRI imagery

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Abstract
In this paper, a new method for the delineation and classification of rainfall areas using MSG/SEVIRI (Spinning Enhanced Visible and Infrared) data is developed. The technique is based on spectral, temporal, and textural properties of clouds. The present method uses as spectral parameters, brightness temperature and temperature differences in different channels. The textural information is based on the grey level rank approach where each pixel of the brightness temperature in the 10.8µm channel image is represented by a code which takes into account the relations between the spatial positions and the grey level ranks of the neighborhood pixels. The temporal parameter (RCT) is the rate of change of brightness temperature over two consecutive images. The developed daytime and nighttime rain area classification technique (RACT-DN) is based on two multilayer perceptron neural networks (MLP-D for daytime and MLP-N for nighttime). The two algorithms (MLP-D and MLP-N) are trained using as reference convective and stratiform classification data from ground meteorological radar over northern Algeria. It was found that the introduction of temporal and textural parameters improved the results of discrimination between convective and stratiform areas.

***Keywords**: Classification, MSG image, radar, artificial neural network, convective and stratiform clouds.*

Multi-measures fusion based on multi-objective genetic programming for full-reference image quality assessment

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Abstract
In this paper, we exploit the flexibility of multi-objective fitness functions, and the efficiency of the model structure selection ability of a standard genetic programming (GP) with the parameter estimation power of classical regression via multi-gene genetic programming (MGGP), to propose a new fusion technique for image quality assessment (IQA) that is called Multi-measures Fusion based on Multi-Objective Genetic Programming (MFMOGP). This technique can automatically select the most significant suitable measures, from 16 full-reference IQA measures, used in aggregation and finds weights in a weighted sum of their outputs while simultaneously optimizing for both accuracy and complexity. The obtained well-performing fusion of IQA measures are evaluated on four largest publicly available image databases and compared against state-of-the-art full-reference IQA approaches. Results of comparison reveal that the proposed approach outperforms other state-of-the-art recently developed fusion approaches.

***Keywords**: Image quality assessment, genetic programming, multi-objective optimization, multigene.*

Segmentation d'image utilisant une hybridation entre la méthode FCM et la Recherche Coucou

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Abstract
In this paper, we introduce an image segmentation method combining the Fuzzy C-means method and the Cuckoo Search . This hybidation based on an objective function expressed by Levine and Nazif's citeria, Zeboudj citeria, Borsotti citeria, has shown a clear improvement of the image segmentation quality. This is shown in comparative study between the results obtained with the FCM method used alone and those obtained with the hybridization FCM and the Cuckoo Search.

***Keywords**: Image segmentation, FCM, Cuckoo Search, hybridization*

Detection of atrial fibrillation using probabilistic interpretation of support vector

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Abstract
Atrial Fibrillation (AF) is an arrhythmia that can lead to several patient risks. It results in partial disorganization of the atrial electric activity. Non deadly but with serious consequences, this kind of arrhythmia affects mostly elderly people, in particular those who suffer from heart failure (one of the main causes of hospitalization). Thus, detection of AF becomes decisive in the prevention of cardiac threats. In this paper, different preprocessing techniques of ECG waveform are used for AF detection. The feature extraction method is based on the analysis of the two main physiological characteristics of AF: i) heart rate irregularity and ii) Atrial Activity (AA). Support Vector Machines (SVMs) classifier, working in binary and asymmetrical classification mode was used as pattern detector. This classifier builds on the probabilistic interpretation of SVMs dedicated for classification with rejection and weighted errors. Experiments on the MIT-BIH database (MITDB) show that our AF detection algorithm has accuracy of 98,4% with no rejection and 99,2% for the optimal classification cost.

***Keywords**: Electrocardiogram, P-wave, atrial fibrillation, support vector machines (SVMs), rejection.*

Burst sEMG activity detection using modified adaptive linear energy detector

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Abstract
This paper describes a diagnostic tool for evaluating and determining the burst duration of muscle's electromyography (EMG) activity by using an energy detector technique, referred to as Modified Adaptive Linear Energy Detector (M-ALED). The ALED method, is based on energy analysis which, has been introduced and widely used for Voice Activity Detection (VAD). In this work, we have modified the ALED method by conditioning the EMG signal by using the Teager Kaise Energy Operator (TKEO) and introducing the order statistic principle. These modifications help improving the robustness w.r.t. noise and hence the detection performance of the method. A performance analysis has been carried out in order to get the appropriate frame length associated to a buffer size of EMG signal, which can be adapted within our proposed approach. Real surface EMG (sEMG) and Synthetic signals are used to illustrate the performance of our proposed method.

***Keywords**: Electromyography (EMG), M-ALEDT, eager Kaise Energy Operator (TKEO), Real surface EMG (sEMG), activity detection.*

Onset electromyography activity detection using a CFAR technique

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Abstract
This work presents a novel technique for the automatic detection of the onset time of muscle's activity using surface electromyography (sEMG) signals. The method applies a Bayesian approach to detect the onset, where we use CA-CFAR principle for burst energy detectors. Under appropriate priors on the observed signal's distributions, we derived the closed form expressions of the false alarm and the detection probabilities. The validity of the proposed method was illustrated using both simulated surface EMG (sEMG) signals, as compared to existing detection methods, and experimental surface EMG signal recordings.

***Keywords**: EMG Activity, onset detection, CFAR.*

Variabilité de surface de la mer méditerranée vue par l'altimétrie satellitaire et la marégraphie

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Abstract
La mer Méditerranée, assimilable à un "océan miniature", se caractérise par la présence de processus physiques complexes recouvrant un large spectre de variabilité spatial et temporel. Ces phénomènes océanographiques sont accentués par la nature de bassin semi-fermé. L'utilisation des mesures issues des missions de l'altimétrie satellitaire et des marégraphes est une composante essentielle pour le suivi, la prévision et la gestion de cette mer. Dans le cadre de cette étude, un ensemble régional de données d'altimétrie satellitaire et les enregistrements in situ de marégraphes, disponibles en Méditerranée sur la période de 1993 à 2015 (ère d'altimétrie satellitaire), ont été analysés en termes de variabilité temporelle et de tendances linéaires. Les tendances de variations estimées à partir des données issues des deux techniques présentent des taux positifs au cours de la période de 1993 à 2015. Ce résultat est suffisant pour admettre d'une part, l'élévation du niveau moyen de la Méditerranée, et d'autre part, la complémentarité des deux techniques de mesures (altimétrie spatiale et marégraphie) pour couvrir les surfaces océaniques de la Terre tout aussi bien en plein océan que sur les zones côtières.

***Keywords**: Méditerranée, niveau de la mer, tendance, altimétrie spatiale, marégraphie.*

Automatic seizure detection in EEG signals using the SVM technique in conjunction with the Entropy and DFA algorithms

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Abstract
We assessed the complexity of the electroencephalogram (EEG) records in normal and epileptic subjects using two nonlinear measures: (1) Sample Entropy (SampEn) and (2) Detrended fluctuation analysis (DFA). SampEn quantifies the regularity while DFA quantifies the temporal correlations; forming overall indices of signal complexity. Both, SampEn and DFA are used to train SVM classifier in order to separate normal subjects from epileptic patients. The presented method showed 100% of accuracy in discriminating between these two classes. The results suggest that there exist differences in the ability of the human brain to generate complex electrical activity between normal peoples and epileptics. We conclude that presented methodology is most promising in providing more insight into the evolution of complexity of underlying brain electrical activity in physio/pathological states.

***Keywords**: Sample Entropy, Detrended fluctuation analysis, electroencephalogram, epilepsy, SVM classifier.*

Joint estimation of CFO and channels for MIMO-OFDM systems

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Abstract
Space Time Block Coding-Orthogonal Frequency Division Multiplexing (STBC-OFDM) based MIMO (Multi Input Multi Output) system has been shown to be robust against non-ideal operating conditions such as antenna correlation, channel estimation errors, and Doppler effects. But, the later suffers from carrier frequency offset (CFO) which makes channels estimation more challenging. In this paper, we propose joint semi-blind CFO and channels estimators based on modified-multiple signal classification (MMUSIC) algorithm for STBC-OFDM system over MIMO channels. Channels state information can be estimated at the receiver using pilot symbols embedded in each transmission block. To this end, we propose to

encode pilot symbols by a Specific Space-Time Block Coder (S-STBC) while information symbols are encoded by Alamouti based space-time block coding (A-STBC). The performance of our algorithms is compared with existing approach by simulations.

***Keywords**: STBC, CFO, MIMO channels, estimation, MUSIC, virtual subcarriers (VSCs), pilot symbols.*

Support vector machine and artificial neural network for rainfall classification from SEVIRI data

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Abstract
In this paper, a model combining two classifiers for improving the classification of precipitation is designed. It is composed of two classifiers namely Support Vector Machine and Artificial Neural Network. The training and testing of developed model are carried out using datasets derived from MSGSEVIRI (Meteosat Second Generation-Spinning Enhanced Visible and Infrared Imager) against collocated data observed by ground radar. Reliable and unreliable pixels are determined. The unreliable pixels are reclassified by using a novel training model. The designed methodology outperformed the two classifiers used independently and reached 93.12 % of overall accuracy of classification.

***Keywords**: Support vector machine, neural network, MSG-SEVIR, radar image, classification.*

Local phase quantization features extraction in discriminative subspace for kinship verification

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Abstract
We introduce LPQ-SIEDA approach to address the challenges posed in kinship verification from face images. Many experiments on the benchmark databases, namely the Cornell database and the UB Kinface database. More substantially, unlike most of the previous works cited in the literature, our proposed approach attain stable performance on all benchmark databases. Our results elucidate that using the proposed approach shows high performance compared favorably against the recent approaches in the literature on the benchmark databases.
***Keywords**: kinship verification, face images, LPQ-SIEDA approach.*

Features extraction using different histograms for texture classification

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Abstract
In this paper, we present three new features extractions methods for the texture classification using patterns recognition neural network, which further improve the classification performance. The first one; we use the histogram of the image as features, the second one; we use the histogram equalization as features, and the third one; we use the histogram of the image LBP as features. The extracted features are used as an input to the ANN classifier. The performance of the proposed methods evaluated by using two classes of Brodatz database textures and has been compared. The experimental results show that the classification accuracy of the proposed methods is 97.9 % for histogram features, 70.8 % for histogram equalization features and 100% for LBP histogram features. The proposed methods are evaluated using confusion matrix and ROC curves.

***Keywords**: Artificial neural network (ANN), features extraction**,** histogram**,** histogram equalization, local binary patterns (LBP), texture analysis.*

Amélioration de la compression d'image à haut débit par le codeur SPIHT

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Abstract
Le codeur SPIHT, même s'il est connu pour son efficacité, reste limité dans l'allocation de la mémoire pour le stockage des images compressées. Afin de remédier à cela, notre travail propose, dans cet article, une amélioration de la compression par une réduction du débit binaire à la sortie de l'encodeur SPIHT. Cette technique simple et efficace, permet de réduire le temps de transmission et l'espace de stockage de l'image compressée sans altérer la qualité de l'image reconstruite par rapport au codeur d'origine SPIHT La technique utilisée dans cet article est implémentée avec MATLAB et la performance de distorsion de débit est comparée à l'aide des paramètres tels que PSNR, MSE, CR et taille de l'image compressée.

***Keywords**: Compression, SPIHT, EZW, image, DWT, PSNR, taux de compression, outbit.*

Semantic similarity approach between two sentences

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Abstract
In this paper a novel method for computing the similarity between pair of sentences is put forward. The proposal involves original preprocessing steps that accounts for negation handling through use of antonyms and lowering semantic similarity together with WordNet semantic similarity measure. Next, Mihalcea et al.'s canonical extension from word to sentence is adopted [8]. The proposal also involves a training based approach where ROC curve of training set was used to tune a threshold like measure that assesses the presence or absence of paraphrasing. The developed approach is tested on Microsoft Paraphrasing Dataset where 70% accuracy and 80% F-score were obtained, which outperform many of related unsupervised / semi-supervised approaches.

***Keywords**: Words similarity, threshold, R.O.C curve.*

Variabilité de la longueur du jour (LOD) et sa corrélation avec le phénomène climatique el niño-southern oscillation (ENSO)

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Abstract
L'objectif de cette étude est d'examiner la variabilité de la longueur du jour (LOD) et d'étudier sa corrélation avec le phénomène ENSO (El Niño-Southern oscillation). À ce titre, la série chronologique LOD (1962-2016) fournie par l'IERS (International Earth Rotation and Reference Systems Service) est analysée par l'utilisation de la technique de décomposition dite "Seasonal-Trend Decomposition Based on Loess method" ou STL. En considérant l'indice des anomalies de la température de surface de la mer (SSTA) sur les régions Niño3, Niño4 et Niño3.4, l'indice multivarié d'ENSO (Multivariate ENSO Index, MEI) et l'Indice de l'Oscillation Australe (Southern Oscillation Index, SOI), le signal des résidus obtenu de la décomposition, indique une corrélation significative avec ces derniers indices de ENSO, notamment pendant les épisodes El Niño 1965-66, 1972-73, 1982-83 et 1997-98 et les épisodes La Niña 1970-71, 1973-74, 1988-89, 2007-08 et 2010-11. C'est un résultat pertinent qui suggère que la variabilité de LOD est en partie liée au phénomène ENSO.

***Keywords**: Longueur du jour, indicateurs ENSO, décomposition, seasonal-trend decomposition based on loess, corrélation.*

The effectiveness of ANFIS estimator position in PV pumping system

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Abstract
This work presents a new ANFIS estimator design. Combining the adaptive capability of the neural network to gather with the reasoning ability of the fuzzy logic in ANFIS modeling results in a fast responding and flexible model. This procedure lends itself perfectly adapted for complex system such as photovoltaic (PV) pumping systems. This paper presents a scheme for PMBLDC (permanent magnet brushless direct current) rotor position estimation based an ANFIS (adaptive network fuzzy inference system) estimator. The operation of such motor requires accurate rotor position knowledge. However, most of rotor position sensors produce undesirable effects such as mechanical losses and have other disadvantages. In order to overcome the disadvantages, sensorless scheme seems to offer great advantages.

***Keywords**: ANFIS estimator, PV pumping system, sensorless position, PMBLDC motor.*

Knapsack problem resolution based on optics inspired optimization algorithm

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Abstract
We present in this paper the application of Optics Inspired Optimization (OIO) algorithm, a metaheuristic destined to resolve optimization problems, to solve the encryption system of Ralph Merkle and Martin Hellman based on the knapsack problem. This algorithm was designed to find good global optimal solutions without being trapped by local optima in complex problems. Before its application on a real problem, this technique has been implemented and validated by benchmark functions to test it and proof its effectiveness. Its use has given excellent results.

***Keywords**: Optimization problems, metaheuristics algorithms, OIO algorithm, encryption, knapsack problem.*

Intégration des micro-miroirs à base de MOEMS dans les sources lasers

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Abstract
In this paper a novel method for computing the similarity between pair of sentences is put forward. The proposal involves original preprocessing steps that accounts for negation handling through use of antonyms and lowering semantic similarity together with WordNet semantic similarity measure. Next, Mihalcea et al.'s canonical extension from word to sentence is adopted [8]. The proposal also involves a training based approach where ROC curve of training set was used to tune a threshold like measure that assesses the presence or absence of paraphrasing. The developed approach is tested on Microsoft Paraphrasing Dataset where 70% accuracy and 80% F-score were obtained, which outperform many of related unsupervised / semi-supervised approaches.

***Keywords**: Words similarity, threshold, R.O.C curve.*

Étude et analyse de la fonction d'ambiguïté et les formes d'onde du système radar

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Abstract
Ces dernières années, une grande attention s'est portée sur la reconnaissance de la forme d'onde du signal de retour dans les radars modernes à cause de leur pertinence. De plus, le choix de la forme d'onde générée par l'émetteur du radar et exploitée par son récepteur revêt en outre une importance primordiale puisqu'elle conditionne l'acuité de la détection. L'objectif principal du présent article s'articule sur l'emploi de la fonction d'ambiguïté pour analyser les formes d'onde. Il étudie et compare le pouvoir de déterminer la portée et la fréquence Doppler de certaines populaires formes d'onde, comme la forme d'onde rectangulaire et la forme d'onde modulée linéairement en fréquence. Le modèle mathématique et les propriétés de la fonction d'ambiguïté des radars sont dérivés. Certains résultats graphiques sont fournis grâce aux simulations numériques. Ces résultats sont utiles pour l'étude et l'analyse de signaux radar.

***Keywords**: Système radar, forme d'onde, fonction d'ambiguïté, analyse temps-fréquence, résolution spatiale.*

A novel compact tip loaded inductively coupled loop meander antenna for 915 MHz RFID tag applications

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Abstract
This paper presents a compact tip loaded inductively coupled loop meander antenna for ultra-high frequency (UHF) radio frequency identification (RFID) applications. The meander and tip loaded techniques are introduced to reduce the size and to enhance the gain of the antenna. The proposed antenna has impedance bandwidth from 900 MHz to 922 MHz for the return loss to be below - 10dB (VSWR<2). The gain of the antenna at 915MHz is about 2.26 dBi. This antenna is designed using Computer Simulation Technology (CST) software. The presented antenna shows multiple qualities and it's easy to match it on each operating frequency.

***Keywords**: Antenna, radio frequency (RFID), tag, impedance matching, return loss, gain.*

A new UWB microstrip patch antenna with irregular fractal ground plane

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Abstract
In this paper, a new Ultra-Wide Band UWB printed monopole square antenna with small size of 12×18 mm^2 is presented. By etching the ground plane as irregular fractal shaped, the effect of the fractal Iterations Orders IO was compared to the traditional rectangular simple ground plane. It is found that the proposed antenna provides a wide usable fractional bandwidth of more than 102% (3.65 GHz - 11.33GHz) defined by -10 dB reflection coefficient. Which is evidently greater than non-fractal geometries, surpasses the bandwidth of UWB requirement. The antenna has an ordinary square radiating patch, therefore displays an omni-directional radiation pattern even at higher frequencies. So, it exhibits good UWB characteristics.

***Keywords**: Fractal antenna, radiation pattern 2D/3D, return-loss, UWB antenna.*

Acoustic noise reduction in two-channel sparse system by efficient proportionate forward adaptive filtering algorithm

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Abstract
This study addresses the speech quality enhancement problem by blind source separation techniques. Recently, several two-channel structures have been used for acoustic noise reduction and speech enhancement based on adaptive filtering algorithms. The forward structure shows a good performance in the two-channel convolutive mixture system when the impulse responses are dispersive. In this paper, we propose new two-channel adaptive filtering structures based on the normalized least mean square algorithm using the proportionate type. This new algorithm is proposed exactly when the convolutive mixing system is characterized by sparse impulse responses type. To validate the good performances of our proposed algorithms, intensive experiments are done with this new algorithm using several criteria for acoustic noise reduction. The obtained results show good performance of proposed proportionate algorithms in comparison with other ones.

***Keywords**: Acoustic noise reduction, sparse system, proportionate algorithm, NLMS algorithm, SegMSE criterion, convergence rate property.*

Comparison study of various speech enhancement methods for robust automatic speaker identification system

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Abstract
In this paper, we review some speech enhancement techniques and we evaluate their performance in terms of Perceptual Evaluation of Speech Quality scores (PESQ, ITU-T P.862) in noisy conditions. All method was evaluated in presence of different kind of noise using TIMIT database and NOIZEUS noisy speech corpus developed in Hu and Loizou laboratory that is suitable for evaluation of speech enhancement algorithms. The noisy database contains 30 sentences corrupted by eight different real -world noises at different SNRs. The noise was taken from the AURORA database. Simulation results conclude that the Tracking of nonstationary noise approach offers an improved performance of speech enhancement in comparison with various methods in terms of PESQ measure. Besides, we have evaluated the effects of speech enhancement techniques on a Speaker Identification system based on autoregressive (AR) model and Mel-frequency Cepstral coefficients (MFCC) that we have developed in [1], where simulation results showed a significant improvement for Tracking of noise algorithm.

Keywords: *Speech enhancement, speaker identification, PESQ, TIMIT.*

A Robust multi-stream feature processing for wireless communications Systems

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Abstract
This article handles possibilities of integrating speech technology in to robust wireless technology, allowing voice input for wireless devices. To improve the robustness of speech frontends we introduce, in this paper, a new set of feature vector which is estimated according to the impact of the proposed multidimensional acoustical features on the performance of the Mel-frequency based-advanced frontend. From the denoised acoustic frame using the wiener filter, we optimize the stream weights of multi-stream Hidden Markov Model (HMM) by deploying a discriminative approach based in Likelihood Maximization (LRM). Finally, these features are adequately transformed and reduced in a multi-stream scheme using Karhunen-Loeve Transform (KLT). The proposed frontend is shown to exhibit a relative error rate reduction and provides comparable recognition performance compared with the current Distributed Speech Recognition FrontEnd (DSR-FE) available in wireless communication systems.

Keywords: *Mobile speech recognition, noise robustness, frontend processing, Wiener filter, likelihood-ratio maximization.*

New two-channel backward normalized decorrelation algorithms for speech quality enhancement : Variable step-size Versions

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Abstract
Most adaptive filtering algorithms have been proposed and implemented on two-channel blind source separation structures for speech quality enhancement. The backward structure shows a good performance in term of estimated signal quality. The backward structure is often used to separate speech form noise and reduce the acoustic noise components at processing output. In this paper, firstly we present new configuration of backward symmetric adaptive decorrelation algorithm using a normalized step-size parameters. Secondly, we propose new implementation of the simple variable step-sizes on backward normalized decorrelation algorithm. Finally, we propose new efficient improved variable step-sizes backward normalized decorrelation algorithm. To validate the good performances of our proposed algorithms, intensive experiments are done using several criteria for speech quality enhancement. The obtained results show good performances of proposed algorithms in comparison with other ones.

Keywords: *Speech enhancement, backward structure, SAD algorithm, system mismatch, normalized step-size.*

Performances study of max-dmin precoder compared to the Alamouti coder

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Abstract
The aim of this paper is to improve the performance of Multi Input Multi Output Spatio temporal Block Code systems by introducing a Maximum of minimum Euclidian distance precoder. We have compared two transmission techniques to obtain the order of maximum diversity of a Multi Input Multi Output system the Maximum of minimum Euclidian distance precoder and the Alamouti code. The precoder is distinguished by the need to know the state of the channel at transmission, in contrast to the spatio-temporal block code. To do this, we simulated the two methods using a Rayleigh type channel model. We have quantified the influence of this knowledge on the bit error rate as well as the increase in the number of antennas at transmission and reception for several modulation profiles.

Keywords: *MIMO, Alamouti code, max-dmin precoder, ML receiver , MRC receiver.*

Bandwidth enhancement of a new modified circular printed planar antenna for UWB applications

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Abstract
This paper presents a new compact planar antenna for the ultra-wideband (UWB) applications. The proposed antenna has the size of 20x20 mm² providing a fractional bandwidth more than 81.19% (4.47 GHz to 10.59 GHz, S11<-10 dB). Frequency and time domain performances of the antenna are investigated. The results show that the proposed antenna presents a good gain performance and has flat transmission coefficient, linear phase and fairly good fidelity factor.

Keywords*: Modified circular planar antenna, bandwidth, return loss, UWB antenna.*

Detection moving objects using codebook with image pyramid

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Abstract
In this paper, we present a novel approach about detecting moving objects in different scenarios using an improved codebook algorithm. First, we tried to apply a pre-processing and post processing by using the image pyramid on the frames that we are going to process before and after applying the codebook on the video. The aim was to reduce the noise and decrease the executing time. Finally, the results are acceptable comparing to the state of the art.

***Keywords**: Codebook, image pyramid, background subtraction.*

Foreground detection using block-matching full search-LBP algorithm for dynamic background video

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Abstract
This paper focuses on developing a new method for discriminate moving objects from a static or dynamic background, concentrating on combine local binary pattern and block matching full Search algorithm. First, the local binary pattern operator labels the pixels of reference and current macro-blocks region, then we used Pearson product-moment correlation to computing linear relationship between the labeling pixels of current and previous macro blocks, in the end of this task we obtained a motion vector matrix. Basing on this last, we clustering the current frame to get a binary mask. To evaluate the performance of our proposed method, we experiment it on challenging sequences. It has shown that our method provides an improved segmentation results**.**

***Keywords**: Local binary pattern, block matching algorithm, full Search, dynamic background, motion detection, Pearson product-moment correlation.*

Détection des changements d'occupation du sol en milieu urbain par traitement numérique des images satellitaires

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Abstract
L'extension rapide et anarchique que connait actuellement la ville d'Oran par l'implantation sans contrôle de l'habitat, des activités et des équipements a abouti à la consommation et le détournement des terres agricoles de leur vocation initiale sous la pression urbaine. Le changement d'occupation du sol d'agricole en urbaine nécessite un suivi et une analyse diachronique. Notre approche consiste à utiliser les techniques de la télédétection pour évaluer et quantifier les changements d'usage du sol au niveau de l'agglomération oranaise. A ce propos, nous avons opté pour la méthode de classification supervisée par le maximum de vraisemblance en exploitant une série d'images satellitaires acquises par les capteurs Landsat d'une résolution spatiale de 30 m datant de 1987 à 2016. Les cartes d'occupation du sol produites à partir du processus de classification supervisée ont permis de quantifier les transformations d'usage des sols et d'identifier la nature du sol sur lequel a été faite l'évolution spatiale de notre périmètre d'étude.

***Keywords**: Transformation d'usage des sols, milieu urbain, télédétection, images Landsat.*

Impact of symmetric encryption algorithms in a VANET

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Abstract
The security of information exchange in vehicular ad-hoc networks (VANET) is a very sensitive and important field of research. It was considered a research priority by the scientific community. Several mechanisms are used to secure this exchange, among which symmetrical cryptography is cited. In this paper, we will study the performance of a set of symmetric cryptographic protocols that are AES-CBC, AES-CTR, AES-GCM, 3DES-CBC, chacha20-poly1305 in terms of time, throughput, bandwidth consumption, advantage And disadvantages. This study will be carried out on a real vehicular network (testbed), in order to provide decision support information to researchers in the field.

***Keywords**: VANET, security, symmetrical cryptography, AES; DES, chacha20-poly1305, performances.*

New application of LBP method for gender classification

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Abstract
In this paper, we present a novel approach about detecting moving objects in different scenarios using an improved codebook algorithm. First, we tried to apply a pre-processing and post processing by using the image pyramid on the frames that we are going to process before and after applying the codebook on the video. The aim was to reduce the noise and decrease the executing time. Finally, the results are acceptable comparing to the state of the art.

***Keywords**: Codebook, image pyramid, background subtraction.*

Reconnaissance automatique du pollen de trois espèces de pins à base de paramètres de formes et de texture utilisant des réseaux bayésiens

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Abstract
The aim of this paper is to apply Bayesian networks for recognizing microscopic objects namely pollen grains. Thus, for our tests, three hundred samples of each of three species of pollen are considered. The recognition procedure is made on the basis of shape and texture features. After images acquisition and pre-processing, three variants of Bayesian networks are applied. The first one is naive Bayesian networks RN which, despite their simple structure and strong assumption on independence, have given very good results. The second one is the naive Bayesian networks augmented by a tree TAN. The third one is the naive Bayesian networks augmented by a forest FAN which have not been investigated in image classification to our knowledge. A comparative study of the results given by these tree types of RB is provided.

***Keywords**: Bayesian network, pattern recognition, pollen, RN, TAN, FAN.*

Adaptation du Model de Mélanges de Gaussiennes au bruit: Appliqué a l'Identification de Locuteur par la VoIP

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Résumé

Ce document évolue la robustesse du model GMM pour l'identification automatique de locuteur dans un réseau sans fils. Des études ont été menées sur une base de données arabe nommée ARADIGIT, dans différents milieux bruités avec différents niveaux de bruit (SNR). Les premières expériences montrent que le GMM n'est pas un model robuste pour la base de donné originale et la base de donné synthétise. Ainsi, nous avons proposé d'adapter le modèle GMM au bruit spécialement lors de l'identification dans la VoIP. Les résultats obtenus confirment l'efficacité de cette technique proposée, dans le cas synthétisé et non synthétisé.

Mots clés: *Mélanges de Gaussiennes (GMM), G729, VoIP, Indentification Automatique du Locuteur (IAL), MFCC, MFCC, ARADIGIT, FanTool.*

The extra-costs of security mechanisms in VANET networks

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Abstract

The Vehicular Ad Hoc Network (VANET) are the networks that allow the exchange of information and communication between vehicles, they offer some applications intended for safety and others to the comforts. They differ from other networks by their special characteristics that must be taken into consideration during the implementation. In recent years, Security in these networks has become a very active field of research. Several mechanisms are used (cryptography, certificates and reputation systems, ect…), but each one has an extra cost on network performances in term of time, financial and network overhead. This paper will present the extra costs of a set of mechanisms, their advantages and their disadvantages to help researchers to choose among them in order to be used in a VANET network.

Keywords*: VANET; Security; Mechanisms; Performances; Extra-costs; Vulnerability; Solution.*

The Channel Shortening for MC-CDMA System over an ADSL Channel using a Water-filling

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Abstract

In this paper our objective focuses on the development of digital transmission techniques in order to solve the problem of Inter-Symbol Interference (ISI) due to multiple paths and the improvement of Multi-Carrier Code Division Multiple Access (MC-CDMA) system performance. The both algorithm: MERRY algorithm (Multicarrier Equalization by Restoration of Redundancy) called TEQ (Time domain EQualizer) and the power allocation method to allocate appropriate power to each user (Water-filling technique (WF)) [1] is used. Finally, the numerical results show that combining Water Filling with TEQ technique allows to reduce the ISI for MC-CDMA systems.

Keywords: *MC-CDMA, the Waterfilling technique,TEQ equaliser, MERRY algorithm*.

Couplage de modes dans les fibres microstructurées à deux coeurs

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Résumé

Les fibres à cristaux photoniques ou les fibres microstructurée air/Silice (FMAS) sont constituées d'un réseau périodique transverse de diélectriques. En introduisant un défaut dans ce réseau, il est possible de guider la lumière par un effet de bandes interdites photoniques, dont les propriétés diffèrent fondamentalement du guidage par réflexion totale interne qui a lieu dans les fibres conventionnelles [1].

Les FMAS à deux coeurs possèdent un potentiel important, et c'est l'une des motivations principales qui nous a poussés à aborder cette thématique dans cet article [2].

L'analyse du couplage inter-coeurs était également indispensable afin d'étudier le problème de la diaphonie. Sa connaissance est importante car il constitue un travail préliminaire à l'étude et la compréhension des FMAS multi-coeurs ou bien un réseau de guides dans la gaine microstructurée. On présente ensuite les principaux résultats sur les effets de battement entre les divers modes, en régime linéaire.

Mots clés: *Couplage de mode, Fibre à cristal photonique, Télécommunication Optique*

Classification des images par les histogrammes de couleurs RGB et les SVM Lights dans un bâtiment intelligent

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Résumé

Un bâtiment intelligent est un environnement qui contient un nombre de capteur et de caméra, qui ont pour objectifs de transmettre des informations, qui donnent les différentes actions prisent par les personnes et leur état, pour être traités par un système de classification de comportements, qui les utilisent comme des entrées pour donner un confort maximal aux personnes, qui se trouvent dans ce bâtiment, avec une consommation d'énergie optimal, par exemple si je fais du sport dans la pièce alors le système diminuera le chauffage.

Notre objectif est de concevoir un système qui fait la classification des images dans ce bâtiment intelligent, dont le but et de reconnaitre 6 comportements des personnes qui occupent ce bâtiment intelligent, afin de leur donner un confort et d'optimiser l'énergie consommée. Nous avons choisis ces 6 comportements, de tel manière qu'ils couvre la majorités des comportements des personnes. La classification est réalisée en utilisant la classification 1 parmi k et dans notre cas k = 6, on construits les 6 modèles dans la phase d'apprentissage en utilisant des noyaux déférents afin de choisir le meilleure model qui donnent le taux de la classification le plus élevé, et enfin pour classer un comportement, on classe les différents images qui le représente. C'est-à-dire faire 6 classifications et prendre le comportement qui a le taux de la classification le plus élevé.

***Mots clés** : traitement d'image, histogramme de couleurs RGB, SVM Lights, classification*

Prototype d'imageur d'étoile pour senseur stellaire

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Résumé

Dans cet article nous présentons un prototype à faible coût de la partie imageur du senseur stellaire (SST). En premier temps, nous avons décri les ressources matérielles utilisées dans le prototype développé. Ensuite, la partie logicielle qui concerne l'algorithme de traitement d'image pour l'extraction des positions des étoiles à partir d'un champ d'étoiles. Enfin, la validation de l'algorithme développé en utilisant des images statiques (images de test d'Alsat) et un banc d'essais basé sur un simulateur d'étoiles. Le résultat obtenu est la détection de plus de trois étoiles avec une fréquence qui peut aller jusqu'à 10HZ, ce qui est suffisant pour la détermination d'attitude d'un véhicule spatiale.

***Mots clés**: Senseur stellaire (SST), imageur d'étoiles, traitement d'images, Raspberry.*

Pectoral Muscle boundary detection using digital mammograms

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Abstract

Breast cancer is the most common cause of death women , for reason of its cause not yet fully known, however the early detection of breast cancer can re- duce the associated morbidity and mortality rates. Accurate removal of pectoral muscle based on the accurate detecting to the pectoral muscle boundary in gray-scale mammogram image, this suppression in mammograms can increase accuracy of the results of CAD techniques that are used for the earlier detection of breast cancer. The paper concerns an approach based on the similarity between intensities to delineate the pectoral muscle boundary using features of measure of semantic similarity between words in Natural Language Process (NLP) and Information Retrieval (IR) felds. The authors use morphological operations to remove the unwanted elements from mammograms such are radiopaque artifacts, in order to have good results.

***Keywords**: Breast cancer, mammogram, NLP, IR, semantic similarity, pectoral muscle.*

Mobile network design Problem Resolution Based on Optics Inspired Optimization Algorithm

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Abstract

The objective of this manuscript is to present and apply a new metaheuristic based on collision theories for solving optimization problems and to satisfy the two main properties, fast convergence and precision. This algorithm was applied for the design of a mobile network, which is an open field of research whose objective is improving the performance and coverage of this network, reducing traffic or minimizing the cost of deployment. The application of colliding bodies' algorithm to the design of a network has significantly minimized the deployment cost and gave excellent results comparing with other metaheuristics used for the same purpose.

***Key words**: Optimization problems, metaheuristic algorithms, mobile network design, Collision Body Optimization (CBO)*

Un routage basé sur les machines à vecteurs supports pour les réseaux ad-hoc

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Résumé

Les réseaux ad-hoc mobiles (MANET) sont des réseaux indépendants de toute infrastructure fixe. Ils permettent une liberté totale de déplacement aux utilisateurs. Vue leur limitations sur les plans énergie et porté de transmission, ils nécessitent des stratégies de routage tr`es délicates pour permettre leur utilisation. Dans ce sens, plusieurs algorithmes de routages ont été développés tels que DSDV, AODV et ZRP. Tous ces protocoles n'utilisent pas l'historique du routage et se basent uniquement sur les informations actuelles pour chaque tentative de routage.

Dans ce travail, nous proposons une technique qui apprend de l'historique des opérations de routage précédentes pour optimiser la charge de routage dans le réseau mobile. Cette technique convient le mieux pour les réseaux représentant une certaine régularité de mouvement tel que dans les réseaux VANET dans les villes, les réseaux de robots dans les environnement industriels,...etc.

Les expérimentations effectuées sur des réseaux simulés sur NS2 et basées sur la méthode SVM (machines `a vecteurs supports) montrent l'amélioration apportée par la technique proposée au protocole AODV.

Mots clés: *MANET, AODV, protocole de routage ad-hoc, Apprentissage artificiel, Machine à Vecteurs Supports.*

Neural Adaptive Fractional Order Differential based Algorithm for Medical Image Enhancement

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Abstract

In this paper, an adaptive fractional differential calculus based method for image enhancement is proposed. The adaptive fractional order used in the fractional differential mask is computed through a neural network based scheme. The training of the neural network is achieved by using adaptive fractional orders calculated by means of AFDA (Adaptive Fractional Differential Approach) algorithm for different medical images. After training, the neural network calculates the appropriate adaptive fractional order that will be substituted in the mask to enhance the image. We carry out experiments on medical images and compare the enhancing performance with that of the AFDA algorithm, demonstrating that the proposed method leads to a better quality of enhanced images, giving rise to clearer edges and richer texture with less computational complexity.

Keywords: *Image Enhancement, Fractional differential calculus, neural network.*

Effective Method for Automatic Reconstruction of Digital Multiplexed Holograms

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Abstract

Holography permits the recording of the whole complex wave front on a photosensible supports or on an optoelectronic detectors (CCD/CMOS). From the quadratic law of detection, the hologram has a real positive distribution, which is mainly formed by the complex wave front, its complex conjugate (repliqua) and the zero order also called DC term. Digital off-axis holography allows the separation of these terms but the influence of the zero order remains considerable because its frequency spread over the entire hologram resulting of a noisy reconstruction. We present in this paper a new method for automatic filtering based on the detection of the diffracted orders in the spectral domain. We show that the suppression of the zero order in the preliminary step has an immediate effect of the improvement the detection peaks of the diffracted orders and the increase of SNR ratio. We show from the experimental multiplexed microparticule holograms the effectiveness of the proposed method. All the results have been obtained from a LabVIEW user interface.

***Keywords**: Multiplexed/composite Hologram, Frequentiel filtering, Peak detection, Numerical reconstruction.*

Markov random field for slow motion detection and object segmentation

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Abstract

In this paper, we present a new modelling of MRF (Markov random field) for motion detection in the case of very slow movement in video sequence. To analyze a slow motion, a spatiotemporal strategy is used. In this strategy, each image from the sequence is compared with far images in time. This distant of comparison allows easily noticing the difference that can represent a motion, which is not possible with the classical modelling. The use of a far temporal analysis requires the redefinition of the energy equation of classical MRF model. The results of this work show the detection of slow motion. In addition, ever the comparison is more distantly, more very slow motion can be detected. In the other hand, the new modelling can determine more clearly the outline of the object and not only his moving regions that can help to localise the whole moving object.

Keywords*: *Surveillance, Markov random field, MRF, motion detection, slow motion, object segmentation.

fMRI Data Adjustment Based on BOLD Signal Clustering

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Abstract

The most common researches towards fMRI depend on the analysis of blood-oxygen-level dependent signal by using the general linear model (GLM). Although numerous methods for GLM study exist, their theory remains incomplete. To achieve a better brain activity detection, we explore a new approach based on a classification gained from the application of the c-means method on BOLD signals generated from the fMRI data. The obtained results are used to construct the design matrix; during the construction process BOLD signals are convolved using the hemodynamic response function (HRF). Moreover, the linear adjustment of BOLD signals will be the focus of this paper since it yields a better investigation of the GLM. To test the performance of the proposed method, we employ the estimation of parameters (β) of each signal. The findings were visualized thanks to the application of t-test for an activity inferior to 0.05. A good adjustment was achieved when TR is superior to 2sc.

Keywords : *fMRI, BOLD, GLM, c-means, clustering.*

Detection Moving Objects Using Codebook with Image Pyramid

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Abstract

In this paper, we present a novel approach about detecting moving objects in different scenarios using an improved codebook algorithm. First, we tried to apply a pre-processing and post processing by using the image pyramid on the frames that we are going to process before and after applying the codebook on the video. The aim was to reduce the noise and decrease the executing time. Finally, the results are acceptable comparing to the state of the art.

Keywords**:** *codebook; image pyramid; background subtraction.*

A MADM method for network selection in heterogeneous wireless networks

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Abstract

The coexistence of different Radio Access Technologies (RATs) in the same area has enabled the researchers to get profit from the available networks by the selection of the best RAT at each moment to satisfy the user requirements. The challenge is to achieve the Always Best Connected (ABC) concept; the main issue is the automatic choice of the suitable Radio Access Technology (RAT) from the list of the available RATs. This decision is called the network selection (NS).

In this paper, we propose a modified Simple Additive Weigh (modified-SAW) function to deal with the drawbacks of the existing solutions. Indeed, the existing Multiple Attribute Decision Making (MADM) methods suffer mainly from the famous problem of rank reversal once an alternative is added or removed, other problems occur in the legacy MADMs. We modify the SAW method intelligently and we use it to solve the NS problem. Finally, we compare the performance of our solution with the previous works in different scenarios; the simulations show that our proposal outperforms the other existing methods.

Keywords : *Always Best Connected, Multiple Attribute Decision Making, modified-SAW, network selection, Radio Access Technologies.*

Détection des faux documents administratifs par machines à vecteurs supports

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Résumé

Avec l'émergence des technologies de numérisation et d'impression sophistiquées, la falsification des documents a connu une augmentation inquiétante. La génération de document frauduleux 'a l'aide d'un scanner et d'une imprimante pour un gain malveillant et illégal est devenue une pratique courante.

La prévention des fraudes est devenue une préoccupation majeure de nombreuses organisations. Bien que la prévention soit la meilleure façon de réduire les fraudes, les fraudeurs sont adaptatifs et trouveront généralement des moyens de contourner ces mesures, surtout avec la présence des moyens technologiques modernes pour manipuler les images. La détection de la fraude est essentielle une fois que le mécanisme de prévention a échoué.

Ce travail vise `a étudier la falsification des documents administratifs, ses techniques et ses outils et de lui proposer des solutions 'a base d'apprentissage automatique.

Mots clés *: Document numérique, falsification, apprentissage automatique, extraction de caractéristiques, traitement d'image.*

Méthode des ensembles de niveaux pour la segmentation d'images en présence d'intensités inhomogènes

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Résumé

Le présent article propose une nouvelle méthode basée région pour la segmentation d'image, qui est capable de traiter le problème d'inhomogénéités d'intensités dans le processus de segmentation. Notre méthode a été validée sur des images synthétiques et réelles de diverses modalités, avec des performances souhaitables en présence d'inhomogénéités d'intensités. Les expériences montrent que notre méthode est plus robuste à l'initialisation, plus rapide et plus précise que le modèle de Chan et Vese bien connu. En tant qu'application, notre méthode a été utilisée pour la segmentation et la correction du biais dans les images de résonance magnétique (IRM) avec des résultats prometteurs.

Mots clés**:** *Correction du biais, image IRM, inhomogénéité d'intensité, level set, Segmentation d'images.*

Effect of Power Amplifier Nonlinearity on M-ary PSK Modulation Using Two Different Media

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Abstract

Wireless communication systems suffer a great deal from the inherent nonlinear nature of power amplifiers. Where the power amplifier is the most power-consuming block in wireless communication systems. It used to amplify the modulated signal before transmission. But in conversely the amplifier distort the transmitted signal.

This paper presents the simulation of the effect of power amplifier nonlinearity on M-ary FSK. Where using Matlab/Simulink environment. Also we are used the constellation diagram to illustrate the nonlinearity affecting on constellation of the M-ary FSK modulation and BER curves are used as performance measure.

***Keyword* :** *M-ary Frequency Shift Keying (M-FSK), Nonlinear amplifier, bit error rate (BER), Additive White Gaussian Noise (AWGN).*

Acquisition et visualisation du signal électrocardiogramme (ECG) sur PC

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Résumé

L'objectif de ce travail est d'acquérir le signal électrocardiogramme ECG et de concevoir une interface pour visualiser ce signal. Ce signal est extrait du corps du patient par les électrodes. La chaine d'acquisition comprend l'amplificateur d'instrumentation, le filtre passe-bande, le filtre et l'amplificateur de gain pour améliorer le signal capté faible.

Notre travail nécessite l'utilisation de deux cartes (la carte d'acquisition électronique et la carte numérique à base d'Arduino). La première a pour objectif l'acquisition et la mise en forme du signal ECG et la deuxième permet la numérisation et l'enregistrement du signal sur une carte SD pour le visualiser sur PC en utilisant une interface.

Mots clés : *ECG , électrode, acquisition, Arduino, interface.*

Combinaison des techniques de filtrage adaptative et non adaptative pour l'extraction du signal cardiaque fœtal

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Résumé

Selon l'OMS 2.6 million de bébé meurent pendant la gréasse. Un bon monitoring de la période prénatale permet une réduction importante de ce taux de mortalité, et il n'est possible qu'avec une bonne détection et extraction du signal cardiaque foetal ; ce dernier en plus des bruit internes issues du corps foetal ce trouve noyé dans différents types de bruit externe d'amplitude nettement plus importante, d'où la complexité de son extraction et la limitation des techniques précédentes qu'a la détection du rythme cardiaque foetal, chose qui n'est absolument pas suffisante pour garantir une bonne prédiction des anomalies foetal cardiaque ; de ce fait, l'extraction des différentes composantes électrique du signal foetal s'impose. Différentes techniques de filtrages existent, et les méthodes de filtrage hybride ont prouver leurs efficacités.

Mots clés*: Fetal ECG; Filtring methods; DWT; LMS; MSE; Cardiac abnormality; FFT; Wiener filter.*

A Multi Band Microstrip Patch Fractal Antenna for WLAN/WIMAX Applications

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Abstract

In this paper, a novel shapes of microstrip patch antenna to obtain multi band behavior for WLAN and WIMAX applications is presented. The proposed antenna consists of combination between KOCH Island with an iteration order of (IO = 3) and SIERPINSKI gasket fractal-shapes. For KOCH ISLAND patch antenna, it is found that, the resonant frequency of the patch can be greatly lowered, when the iteration order increases and the antenna become multi band from the second iteration. In addition, the introduction of SIERPINSKI Gasket with an iteration number of n = 3 and different iteration factors, shows that for τ = 0.75 the bandwidth [5.03GHz - 6.06GHz] which can used for WLAN and WiMAX applications is more important compared to the KOCH ISLAND antenna.

The design was performed using the CST Microwave Studio Software. For each structure the return loss (S11), radiation pattern and gain are simulated, compared and discussed.

Keywords: *Fractal antenna, KOCH ISLAND fractal-shape, Multi Band Antenna, SIERPINSKI GASKET.*

Facial Age Estimation Based on Texture Descriptors

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Abstract

Human face image contains much information about personal characteristics especially in biometrics systems including the person's identity, gender, emotional, expression, age…etc. In this paper, we present and applied different descriptors to estimate human age from facail images, using Multi Blocks Local Binary Pattern (MB-LBP), Binarized Statistical Image Features (BSIF), Local Phase Quantization (LPQ), Histograms of Oriented Gradients (HOG) and we apply a novel method called Multi Blocks Histograms of Oriented Gradients (MB-HOG) by support vector Machine regression (SVR), at the end, we evaluate the performance of facial age estimation systems by two protocols MAE and CS. Our experments are conducted on two public database (FG-NET and PAL).

Keywords *: Age estimation, Biometric, MB-LBP image, MAE and CS, LPQ,BSIF,HOG, SVR and MB-HOG.*

Gestion d'un carrefour intelligent

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Résumé

Le transport a toujours été un élément déterminant de la vie urbaine et de son développement économique. Lorsque la demande du trafic dépasse les capacités de l'infrastructure, la congestion entraîne une dégradation importante de la qualité de la conduite, des files d'attente avec des retards excessifs. Dans le milieu urbain, les congestions sont amplifiées lorsque plusieurs flux de véhicules tentent d'accéder à un même lieu. Les intersections font partie de ces lieux partagées par plusieurs flux conflictuels. Elles se trouvent ainsi au centre des préoccupations urbaines. Les intersections sont des lieux qui méritent une attention particulière car elles offrent une sécurité réduite et perturbent les déplacements. La signalisation tricolore joue un rôle considérable dans l'augmentation des capacités des intersections. La gestion de l'écoulement du trafic s'effectue à travers la boucle de régulation de l'intersection : Cette boucle est constituée de deux parties qui sont l'intersection et le système de feux de signalisation associé.

Nous avons besoin d'un modèle qui permet de décrire le comportement des véhicules au sein des intersections. Ensuite, en se basant sur ce modèle, nous nous affranchissons du principe du partage temporel de l'espace de l'intersection afin d'améliorer la fluidité du trafic. A ce niveau, se pose le problème de l'approche permettant d'optimiser l'attribution de l'espace de l'intersection.

***Mots clés** : régulation , réseaux de pétri, trafic urbain*

Implementation of time-frequency Distributions based on compact support kernels

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Abstract

This paper deals with hardware implementation of high-resolution kernel-based time-frequency distributions (TFDs) of Cohen's class derived from kernels with compact support. As for the time-lag CB kernel applied the first time to time-frequency signal analysis by Cheriet and Belouchrani, the separable CB and the polynomial CB kernels are used to generate their corresponding distributions in the t-f plane according to the method and system proposed by Cheriet and Belouchrani in their patent. The method uses first the Hilbert transform for producing analytical signals from real samples of the original signal then computes the convolutions of the proposed compact support kernels and the instantaneous autocorrelation functions and finally applies a Fourier transform to determine information related to the energy of the original signal with respect to time and frequency. The performance of the KCS-based TFDs and their numerical complexity were discussed in details in. The combination of the

obtained results, together with the method and system implementation proposed in, make these recently proposed distributions the best candidates for real-time implementation of high-performing DSP and/or FPGA embedded systems for practical estimation of nonstationary signals' energy.

Keywords: *Cheriet-Belouchrani (CB) TFD, Cohen's class, DSP, embedded system, FPGA, kernels with compact support, performance evaluation, polynomial compact support kernel, quadratic time-frequency distributions (TFDs), real-time implementation, separable compact support kernel, time-frequency analysis.*

Color-based Segmentation using Kohonen Self-Organizing Map (SOM) for x-ray airline image

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Abstract
Color image segmentation using Kohonen Self-Organizing Map (SOM), is proposed in this study. RGB color spaces is used as input in the process of clustering by SOM, the Wiener filter has been used to estimate the desired value of a noisy image before the operation .The clustering result, according to 4 clusters. In addition, a median filter for post-processing is introduced to effectively eliminate small spatial regions which are formed from the clustering result. Then, the validity of clustering result is tested by Validity Measure (VM) to determine the most optimal parameters of SOM, after we compare the result with k-mean and fuzzy c-mean methods. This system allows segmentation process become automatic and unsupervised. The segmentation results are close to human perception.

Keywords: *Image segmentation, clustering, self-srganizing map, Wiener filter, median filter, unsupervised.*