

MATLAB

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ABSTRACTS

MATLAB DOMAIN: IEEE -IMAGE PROCESSING

1. ADAPTIVE BILATERAL FILTER FOR SHARPNESS ENHANCEMENT AND NOISE REMOVAL

ABSTRACT:

We proposed a novel method for adaptive bilateral filter for sharpness enhancement and noise removal. It sharpens an image by increasing the slope of the edges without producing overshoot or undershoots. It is an approach to sharpness enhancement that is fundamentally different from the unsharp mask. This new approach to slope restoration also differs significantly from previous slope restoration algorithms in that the adaptive bilateral filter does not involve detection of edges or their orientation, or extraction of edge profiles. In the adaptive bilateral filter, the edge slope is enhanced by transforming the histogram via a range filter with adaptive offset and width. The ABF is able to smooth the noise, while enhancing edges and textures in the image. The parameters of the ABF are optimized with a training procedure. ABF restored images are significantly sharper than those restored by the bilateral filter. Compared with an USM based sharpening method—the optimal unsharp mask, ABF restored edges are as sharp as those rendered by the OUM, but without the halo artifacts that appear in the OUM restored image. In terms of noise removal, ABF also outperforms the bilateral filter and the OUM. We demonstrate that ABF works well for both natural images and text images.

Index Terms:

Bilateral filter,
De-blurring,
Noise removal,
Sharpness enhancement,
Slope restoration.

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2. A SYNOPSIS OF RECENT WORK IN EDGE DETECTION USING THE DWT

Abstract

Research in automatic edge detection is an active field because it is used in many different applications in image processing, such as diagnosis in medical imaging, topographical recognition and automated inspection of machine assemblies. Automatic edge detection within an image is a difficult task. When viewing an image, humans can easily determine the boundaries within an image without conscious thought. However, no single edge detection algorithm, at present, has been discovered which will automatically successfully discover all edges for many diverse images. Automatic edge detection is a highly researched field because it is used in many different applications in image processing, such as diagnosis in medical imaging, topographical recognition and automated inspection of machine assemblies. Historically, the Discrete Wavelet Transform (DWT) has been a successful technique used in edge detection. The contributions of new, recent work in this area are examined and summarized concisely. Utilizing multiple phases, such as de-noising, reprocessing threshold coefficients, smoothing, and post processing, are suggested for use with multiple iterations of the DWT in this research. The DWT is combined with various other methods for an optimal solution for the edge detection problem.

PROPOSED METHOD:

We approach for edge detection using the DWT, proposed by uses two distinct families of wavelets. Two dissimilar wavelets are referenced because isotropic wavelets excel at isolating point wise discontinuities and directional wavelets shine at locating contoured paths; each type corrects a weakness in the other type of wavelet

3. ROBUST GLOBAL MOTION ESTIMATION ORIENTED TO VIDEO OBJECT SEGMENTATION

Abstract:

Motion is an important part of video signals; motion estimation is one of the most widely used methods in video processing. Most global motion estimation (GME) methods are oriented to video coding while video object segmentation methods either assume no global motion (GM) or directly adopt a coding oriented method to compensate for GM. This paper proposes a hierarchical differential GME method oriented to video object segmentation. A scheme which combines three-step search and motion parameters prediction is proposed for initial estimation to increase efficiency. A robust estimator that uses object information to reject outliers introduced by local motion is also proposed. For the first frame, when the object information is unavailable, a robust estimator is proposed which rejects outliers by examining their distribution in local neighborhoods of the error between the current and the motion-compensated previous frame. Subjective and objective results show that the proposed method is more robust, more oriented to video GME has many applications, such as sprite generation, video coding, scene construction, and video object segmentation. Depending on the application, the requirements on GME may differ. For example, in video coding, estimated motion does not need to resemble the true motion as long as the bit rate is achieved for a given quality

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Proposed Method:

A scheme which combines three-step search and motion parameters prediction is proposed for initial estimation to increase efficiency.

4.LOCAL FEATURES FOR ENHANCEMENT AND MINUTIAE EXTRACTION IN FINGERPRINTS**Abstract:**

Fingerprints are the most widely used biometric feature for person identification and verification in the field of biometric identification. Fingerprints have been in use for biometric recognition since long because of their high acceptability, immutability and individuality. Immutability refers to the persistence of the fingerprints over time whereas individuality is related to the uniqueness of ridge details across individuals. Fingerprints possess two main types of features that are used for automatic fingerprint identification and verification: (i) global ridge and furrow structure that forms a special pattern in the central region of the fingerprint and (ii) Minutiae details associated with the local ridge and furrow structure. This paper presents the implementation of a minutiae based approach to fingerprint identification and verification and serves as a review of the different techniques used in various steps in the development of minutiae based Automatic Fingerprint Identification Systems, In combination with these techniques, preliminary results on the statistics of fingerprint images are then presented and discussed.

Proposed Method:

Finger print minutia impressions were pre-enhanced by the introduced method and the detected minutia points are superimposed (rings) on the enhanced fingerprint images.

5.IMAGE DIFFUSION USING SALIENCY BILATERAL FILTER**Abstract**

One challenge in bilateral filter is to choose an appropriate kernel, for balancing the trade-off between edge maintaining and noise removal. In this paper, we propose to improve the performance of the 4th floor Oberle Tower Balmatta Mangalore 0824-4261407 ,9886271407
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bilateral filter by replacing the constant kernels with a function decreasing with the boundary saliency. We call this adaptive filtering scheme as Saliency Bilateral Filter (SBF) which can average smooth regions with a broad filtering kernel and preserve strong boundaries with a sharp one. It can smooth away noise and small-scale structures while retaining important features, thus improving the performances for many image processing algorithms. In this paper, we present a novel diffusion algorithm for which the filtering kernels vary according to the perceptual saliency of boundaries. The effectiveness of the proposed approach is validated by experiments on various medical images.

Proposed System:

To adjust filtering kernels based on the saliency of boundaries. The connection between the filtering kernel and perceptual saliency makes it possible to remove noise and preserve salient boundaries adaptively. The qualitative and quantitative results show convincing recompense in comparison with the bilateral filter and other popular filters.

6. BIOMETRIC INSPIRED DIGITAL IMAGE STEGANOGRAPHY

ABSTRACT:

Steganography is defined as the science of hiding or embedding "data" in a transmission medium. The word Steganography is originally made up of two Greek words which mean "Covered Writing". Steganalysis is the science of attacking Steganography

In a battle that never ends. It mimics the already established science of Cryptanalysis. Note that a Steganographer can create a Steganalysis merely to test the strength of her algorithm. Its ultimate objectives, which are indefectibility, robustness (i.e., against image processing and other attacks) and capacity of the hidden data (i.e., how much data we can hide in the carrier file), are the main factors that distinguish it from other "sisters-in science" techniques, namely watermarking and Cryptography. This paper provides an overview of well known Steganography methods. It identifies current research problems in this area and discusses how our current research approach could solve some of these problems. We propose using human skin tone detection in color images to form an adaptive context for an edge operator which will provide an excellent secure location for data hiding.

Proposed System:

Our proposed framework, Steganoflage, is based on edge embedding in the DWT domain using skin tone detection in RGB sequential image files. We chose to use the latter to compensate for the limited capacity that edge embedding techniques demonstrate. We use the actual elements of the image when hiding a message. This leads to many exciting and challenging future research problems.

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7. AUTOMATED ESTIMATION OF THE UPPER SURFACE OF THE DIAPHRAGM IN 3-D CT IMAGES

Abstract:

Modern CT scanners can generate volumetric images with high spatial resolution within 20 to 30 s; these images display the details of the human body. Recognition of the anatomical structures of the human body is the first step in the development of a CAD system. The diaphragm is located below the lungs and above the liver. The shape of the diaphragm is not uniform and changes with breathing. The state of respiration during the CT scans influenced the shape of the diaphragm in the CT images. Shape model-based segmentation of the diaphragm. Instead of using a predefined shape model, we used the bottom surface of the lung to directly determine the shape of the diaphragm in the CT images, and we avoided the influence of the variation in the shape of the diaphragm that is caused by respiration during the CT scan. This paper describes a fully automated method by which the position of the diaphragm surface can be estimated by deforming a thin-plate model to match the bottom surface of the lung in CT images.

Proposed system:

A fully automated method to estimate the position of the upper surface of the diaphragm from non-contrast torso CT images. This method was applied to 338 torso CT images, and the diaphragm was successfully identified in 265 images. The validity and usefulness of this method was demonstrated. We also confirmed that the results of diaphragm recognition were useful for the identification of the anatomical structure of the body cavity from CT images.

8. INVARIANT IMAGE WATERMARKING BASED ON STATISTICAL FEATURES IN THE LOW-FREQUENCY DOMAIN

Abstract:

We are of the belief that the easiest way to keep something from prying eyes is to place it right in front of the person looking for it and make it look as innocuous as possible. Everyone has a taste for a certain kind of collection of data. It is more than likely that the person will have that kind of data on the storage device of his computer.

Our aim is to come up with a technique of hiding the message in the data file in such a way, that there would be no perceivable changes in the data file after the message insertion. At the same time, if the message that is to be hidden were encrypted, the level of security would be raised to quite a satisfactory level. Now, even if the hidden message were to be discovered the person trying to get the message would only be able to lay his hands on the encrypted message with no way of being able to decrypt it. The purpose here is to forbid any unauthorized use of an image by adding an obvious identification key, which removes the image's commercial value. The two features are: 1) mathematically invariant to scaling the size of images; 2) independent of the pixel position in the image plane; 3) statistically resistant to cropping; and

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4) robust to interpolation errors during geometric transformations, and common image processing operations

Proposed System:

The proposed system uses data such as image, text, noise and signature as a carrier medium which add another step in security. The objective of the newly proposed system is to create a system that makes it very difficult for an opponent to detect the existence of a secret message by encoding it in the carrier medium as a function of some secret key and that remains as the advantage of this system.

9. TRANSFORM METHODS FOR REMOTE SENSING ENVIRONMENTAL MONITORING

Abstract:

Transform methods in signal and image processing generally speaking are easy to use and can play a number of useful roles in remote sensing environmental monitoring. Examples are the pollution and forest fire monitoring. Transform methods offer effective procedures to derive the most important information for further processing or human interpretation and to extract important features for pattern classification. Most transform methods are used for image (or signal) enhancement and compression. However other transform methods are available for linear or nonlinear discrimination in the classification problems. In this paper we will examine the major transform methods which are useful for remote sensing especially for environmental monitoring problems. Many challenges to signal processing will be reviewed. Computer results are shown to illustrate some of the methods discussed.

Proposed System:

Nonlinear PCA attempts to use high order statistics in PCA analysis. The independent component analysis (ICA) seeks for independent components which provide complimentary information of the data. ICA may use high-order statistical information. Its computation can now be more efficient by using fast ICA algorithms.

10. A MODIFIED PROBABILISTIC NEURAL NETWORK FOR PARTIAL VOLUME SEGMENTATION IN BRAIN MR IMAGE

Abstract:

High-quality magnetic resonance imaging (MRI) is routinely used to obtain anatomical structure of the brain in both clinical and research arenas. A modified probabilistic neural network (PNN) for brain tissue

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segmentation with magnetic resonance imaging (MRI) is proposed. In this approach, covariance matrices are used to replace the singular smoothing factor in the PNN's kernel function, and weighting factors are added in the pattern of summation layer. This weighted probabilistic neural network (WPNN) classifier can account for partial volume effects, which exist commonly in MRI, not only in the final result stage, but also in the modeling process. It adopts the self-organizing map (SOM) neural network to overly segment the input MR image, and yield reference vectors necessary for probabilistic density function (PDF) estimation. A supervised "soft" labeling mechanism based on Bayesian rule is developed, so that weighting factors can be generated along with corresponding SOM reference vectors. Tissue classification results from various algorithms are compared, and the effectiveness and robustness of the proposed approach are demonstrated.

Proposed system:

The proposed algorithm and some other popular segmentation algorithms were applied to simulated MR images and real MR images for validation. Our results demonstrate that both the MCR and relative overlap ratio are improved using WPNN compared with other algorithms.

11. AUTOMATIC EXUDATES DETECTION FROM NON-DILATED DIABETIC RETINOPATHY

ABSTRACT:-

Diabetic-related eye diseases are the most common cause of blindness in the world. So far the most effective treatment for these eye diseases is early detection through regular screenings. To lower the cost of such screenings, we employ state-of-the-art image processing techniques to automatically detect the presence of abnormalities in the retinal images obtained during the screenings. In this Paper, we focus on one of the abnormal signs: the presence of exudates in the retinal images. We propose a novel approach that combines brightness adjustment procedure with statistical classification method and local-window-based verification strategy. Experiment can be done to indicate that we are able to achieve 100% accuracy in terms of identifying all the retinal images with exudates while maintaining 70% accuracy in correctly classifying the truly normal retinal images as normal. This translates to a huge amount of savings in terms of the number of retinal images that need to be manually reviewed by the medical professionals each year.

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12.3-D MODEL-BASED VEHICLE TRACKING

Abstract:

This paper aims at tracking vehicles from monocular intensity image sequences and presents an efficient and robust approach to three-dimensional (3-D) model-based vehicle tracking. Under the weak perspective assumption and the ground-plane constraint, the movements of model projection in the two-dimensional image plane can be decomposed into two motions: translation and rotation. They are the results of the corresponding movements of 3-D translation on the ground plane (GP) and rotation around the normal of the GP, which can be determined separately. A new metric based on point-to-line segment distance is proposed to evaluate the similarity between an image region and an instantiation of a 3-D vehicle model under a given pose. Based on this, we provide an efficient pose refinement method to refine the vehicle's pose parameters. An improved EKF is also proposed to track and to predict vehicle motion with a precise kinematics model. Experimental results with both indoor and outdoor data show that the algorithm obtains desirable performance even under severe occlusion and clutter.

PROPOSED METHOD:

We also tested the proposed tracking algorithm with explicit occlusion reasoning on an image sequence that contains significant occlusion to demonstrate the algorithm's robustness to occlusion.

13.DYNAMIC SIGNATURE VERIFICATION USING DISCRIMINATIVE TRAINING

Abstract:

Signature verification is a commonly used biometric authentication method. Compared to other forms of biometric authentication such as finger print or iris verification, signature verification has the advantage that it is an historically well established and well accepted approbation method and is thus perceived to be less intrusive than many modern alternatives.

We propose a new approach to dynamic signature verification using the discriminative training framework. The authentic and forgery samples are represented by two separate Gaussian Mixture models and discriminative training is used to achieve optimal separation between the two models. An enrollment sample clustering and screening procedure is described which improves the robustness of the system. We also introduce a method to estimate and apply subject norms representing the "typical" variation of the subject's signatures. The subject norm functions are parameterized, and the parameters are trained as an integral part of the discriminative training

14.A UNIVERSAL NOISE REMOVAL ALGORITHM WITH AN IMPULSE DETECTOR

ABSTRACT:

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This paper a local image statistic for identifying noise pixels in images corrupted with impulse noise of random values. The statistical values quantify how different in intensity the particular pixels are from their most similar neighbors. We continue to demonstrate how this statistic may be incorporated into a filter designed to remove additive Gaussian noise. The result is a new filter capable of reducing both Gaussian and impulse noises from noisy images effectively, which performs remarkably well, both in terms of quantitative measures of signal restoration and qualitative judgments of image quality. Our approach is extended to automatically remove any mix of Gaussian and impulse noise.

15.FINGERPRINT IMAGE ENHANCEMENT ALGORITHM AND PERFORMANCE EVALUATION

ABSTRACT:

A critical step in automatic fingerprint matching is to automatically and reliably extract minutiae from the input fingerprint images. However, the performance of a minutiae extraction algorithm relies heavily on the quality of the input fingerprint images. In order to ensure that the performance of an automatic fingerprint identification/verification system will be robust with respect to the quality of input fingerprint images, it is essential to incorporate a fingerprint enhancement algorithm in the minutiae extraction module. We present a fast fingerprint enhancement algorithm, which can adaptively improve the clarity of ridge and valley structures of input fingerprint images based on the estimated local ridge orientation and frequency. We have evaluated the performance of the image enhancement algorithm using the goodness index of the extracted minutiae and the accuracy of an online fingerprint verification system. Experimental results show that incorporating the enhancement algorithm improves both the goodness index and the verification accuracy.

16.NUMBER PLATE RECOGNITION

The main focus in this research is to experiment deeply with, and find alternative solutions to the image segmentation problems within the License Plate Recognition framework .it is necessary to locate and extract the license plate region from a larger scene image. Second, having a license plate region to work with, the alphanumeric characters in the plate need to be extracted from the background so as to deliver them to an OCR system for recognition.

In order to identify a vehicle by reading its license plate successfully, it is obviously necessary to locate the plate in the scene image provided by some acquisition system (e.g. video or still camera). Locating the region of interest aids in dramatically reducing both the computational expense and algorithm complexity. Also, the input to the following segmentation and recognition stages is simplified, resulting in easier algorithm design and shorter computation times.

Automatic Number Plate Recognition (ANPR) which is also known as Number Plate Recognition (NPR) or License Plate Recognition (LPR) is a system for automated identification of vehicle number plates. This allows cars to be tracked and their whereabouts to be documented in real-time. Its uses range from

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calculating the time someone has spent in a car-park of a superstore to counter-terrorism surveillance of ports and airports.

MATLAB DOMAIN: IEEE -SIGNAL PROCESSING

1. ROBUST SPEAKER RECOGNITION IN NOISY CONDITIONS

Abstract

This paper investigates the problem of speaker identification and verification in noisy conditions, assuming that speech signals are corrupted by environmental noise, but knowledge about the noise characteristics is not available. This research is motivated in part by the potential application of speaker recognition technologies on handheld devices or the Internet. While the technologies promise an additional biometric layer of security to protect the user, the practical implementation of such systems faces many challenges. One of these is environmental noise. Due to the mobile nature of such systems, the noise sources can be highly time-varying and potentially unknown. This raises the requirement for noise robustness in the absence of information about the noise. This paper describes a method that combines multicondition model training and missing-feature theory to model noise with unknown temporal-spectral characteristics. Multicondition training is conducted using simulated noisy data with limited noise variation, providing a "coarse" compensation for the noise, and missing-feature theory is applied to refine the compensation by ignoring noise variation outside the given training conditions, thereby reducing the training and testing mismatch. This paper is focused on several issues relating to the implementation of the new model for real-world applications. These include the generation of multicondition training data to model noisy speech, the combination of different training data to optimize the recognition performance, and the reduction of the model's complexity.

The new algorithm was tested using two databases with simulated and Realistic noisy speech data. The first database is a redevelopment of the TIMIT database by rerecording the data in the presence of various noise types, used to test the model for speaker identification with a focus on the varieties of noise. The second database is a handheld-device database collected in realistic noisy conditions, used to further validate the model for real-world speaker verification. The new model is compared to baseline systems and is found to achieve lower error rates.

2. VERTICAL HANDOFF DECISION ALGORITHM FOR UMTS-WLAN

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Abstract

The next generation of mobile/wireless communication systems is expected to include heterogeneous broadband wireless networks that will coexist and use a common IP core to offer a diverse range of high data rate multimedia services to end users with contemporary mobile devices that are equipped with multiple network interfaces since the networks have characteristics that complement each other. This requires the provision of seamless vertical handoff. This paper provides components of an adaptive multiple attribute vertical handoff decision algorithm that enables access network selection at a mobile node. A performance study using the integration of wireless wide area networks (WWANs) and wireless local area networks (WLANs) as an example shows that our proposed vertical handoff decision algorithm is able to determine when a handoff is required, and selects the best access network that is optimized to network conditions, quality of service requirements, user preferences, and service cost.

3. EXTRACTION OF FETAL ELECTROCARDIOGRAM USING ADAPTIVE NEURO-FUZZY INFERENCE SYSTEMS**Abstract**

In this paper, we investigate the use of adaptive neuro-fuzzy inference systems (ANFIS) for fetal electrocardiogram (FECG) extraction from two ECG signals recorded at the thoracic and abdominal areas of the mother's skin. The thoracic ECG is assumed to be almost completely maternal (MECG) while the abdominal ECG is considered to be composite as it contains both the mother's and the fetus' ECG signals. The maternal component in the abdominal ECG signal is a nonlinearly transformed version of the MECG. We use an ANFIS network to identify this nonlinear relationship, and to align the MECG signal with the maternal component in the abdominal ECG signal. Thus, we extract the FECG component by subtracting the aligned version of the MECG signal from the abdominal ECG signal. We validate our technique on both real and synthetic ECG signals. Our results demonstrate the effectiveness of the proposed technique in extracting the FECG component from abdominal signals of very low maternal to fetal signal-to-noise ratios. The results also show that the technique is capable of extracting the FECG even when it is totally embedded within the maternal QRS complex.

4. ROBUST TEXT-INDEPENDENT SPEAKER VERIFICATION USING GENETIC PROGRAMMING

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Abstract

Robust automatic speaker verification has become increasingly desirable in recent years with the growing trend toward remote security verification procedures for telephone banking, biometric security measures and similar applications. While many approaches have been applied to this problem, genetic programming offers inherent feature selection and solutions that can be meaningfully analyzed, making it well suited to this task. This paper introduces a genetic programming system to evolve programs capable of speaker verification and evaluates its performance with the publicly available TIMIT corpora. We also show the effect of a simulated telephone network on classification results which highlights the principal advantage, namely robustness to both additive and convolutive noise.

5. MBER Space-Time Decision Feedback Equalization Assisted Multi-user Detection for Multiple Antenna Aided SDMA Systems**Abstract**

This paper proposes space-time decision feedback equalization (ST-DFE) assisted multiuser detection (MUD) scheme for multiple receiver antenna aided space division multiple access systems. A minimum bit error rate (MBER) design is invoked for the MUD, which is shown to be capable of improving the achievable bit error rate performance and enhancing the attainable system capacity over that of the standard minimum mean square error (MMSE) design. An adaptive implementation of the MBER ST-DFE assisted MUD is proposed using a stochastic gradient-based least bit error rate algorithm, which is demonstrated to consistently outperform the classical least mean square (LMS) algorithm, while achieving a lower computational complexity than the LMS algorithm for the binary signalling scheme. Our simulation results demonstrate that the MBER ST-DFE assisted MUD is more robust to channel estimation errors as well as to potential error propagation imposed by decision feedback errors, compared to the MMSE ST-DFE assisted MUD.

6. PERFORMANCE OF MULTI-USER PHASED CHIRP MODULATION SPREAD SPECTRUM OVER FLAT FADING CHANNELS**ABSTRACT:**

Multi-user phased chirp modulation spread spectrum provides an alternative multiple access technique to direct sequence and frequency-hopping spread spectrum. This technique spreads the users' 4th floor Oberle Tower Balmatta Mangalore 0824-4261407 ,9886271407
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BPSK modulated signals with linear chirps of different chirp rates and phases, thus creating a pseudo-orthogonal set of spreading codes. In this project, we (we actually means I) investigate its bit error rate performance in Rayleigh, Rician, and Nakagami-m flat fading channels when the coherence time is in the order of the bit duration. An analytical expression as well as upper bounds for the average system bit error probability is derived. We outline a simulation model in MATLAB™ and present simulated bit error rates over four flat fading channels in three Doppler environments.

SCOPE OF THE PROJECT:

This project, a multi-user phased chirp modulation spread spectrum system model is described for use in MAC channels experiencing flat amplitude fading. An analytical expression and two less complex upper bounds for the average system probability of bit error were derived using the moment generating function technique. An equivalent baseband system model for BER simulations in MATLAB™ is carried out, which included Nakagami-m fading generator based on transformation mapping.

7. ADAPTIVE DSCDMA RECEIVER FOR MULTI-USER DETECTION

ABSTRACT:

Near-Far problem in Direct-Sequence Code-Division Multiple-Access communication field has drawn a lot of attentions. The focus of this paper is on the multiuser interference rejecting capability of this so-called adaptive DS/CDMA receiver. The receiver uses a chip matched filter followed by an adaptive equalizer structure. It allows users adjust to the interference and noise. Qualitive results of this receiver and conventional receiver is compared showing with a lower BER. Also by inspecting the BER results with and without power control, we conclude that this receiver is resistant to Near-Far effect.

INTRODUCTION

Powers received from users at different distance vary a lot due to propagation fading. Near-far problem is generated for conventional receiver without any resistance to it. To be able to distinguish individual user's signal from all others' and noise, system has to be able to manage the power transmitted by each user in a way that they all appear with similar power when they arrive. This problem is called as Multi-User or Multi-Access Interference (MUI or MAI). It can significantly degrade system performance in terms of Bit Error Probability(BER). To handle this problem, we have two solutions. One is as stated above, use power management technique; the other one is to use some kind of interference-resistant receiver or detector to demodulate the signal. In power management technique, if transmitting powers are updated at a moderated rate, power control can only account for differences in received power due to propogation loss. Multipath induced fading can still cause a Near-Far situation. To overcome this, transmitter will have to adjust themselves a few hundreds times per second, which causes too much loading. On the other hand, using interference-resistant receiver can overcome same problem. If the receiver has information about the interfering signals, it can regenerate it and then subtract it from the received signal to recover the original signal sent. A lot of research work has been done on interference-resistant receiver, a common issue they all encounter is that they all require a large amount of information about the delays and sequences used by each user. In reality, this information maybe is available to the BaseStation, but unlikely available to the mobile station. Therefore, downlink is still an issue for that kind of receiver. Additionally,

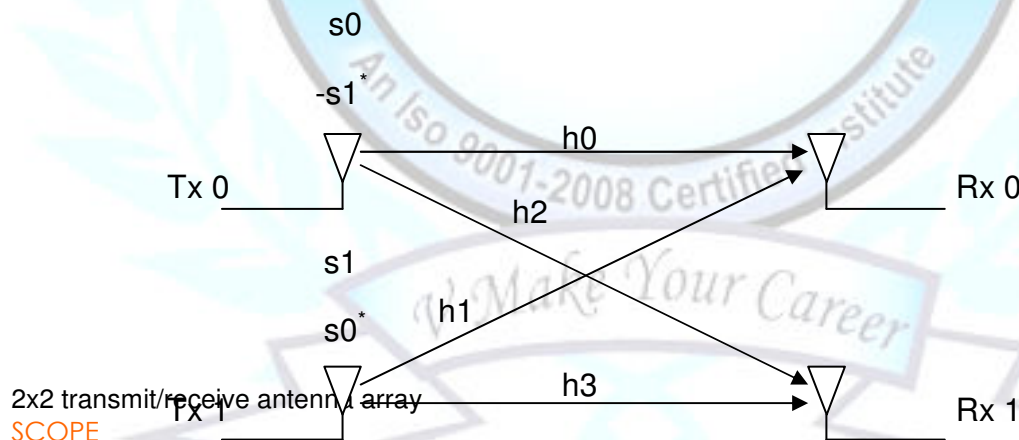
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these sorts of receivers can't get feasible information about delays in multipaths environment. Except this kind of interference-resistant receiver, another approach is to use some sort of diversity technique. As a popular topic today, Space-Time diversity can be implemented at BaseStation to achieve diversity gain, but again, it's not feasible to implement it at mobile, downlink is still the problem. This paper will discuss about a type of receiver that is based on equalizer and can achieve similar performance as ideal RAKE receiver without knowledge of delays of multipaths. Studies and work has been done by Honig and Verdu . This receiver is called Adaptive DS/CDMA Multiuser Interference Resistant Receiver. The receiver uses a chip matched filter followed by an adaptive equalizer structure to perform de-spreading operation. This structure allows it to adjust to prevailing interference and noise environment. The relative simplicity of the receiver structure makes its use attractive not only to BaseStations, but also to mobiles.

The goal of this paper is to evaluate the performance of this receiver comparing to the conventional receiver. The organization of this paper is: in next section we will discuss the channel model and receiver structure, then we will qualitatively analyze the performance of this receiver in terms of Bit Error Probability comparing to conventional receiver and compare the capacities, at last we will draw our conclusion based on the results.

8. SPACE TIME CODED SYSTEM FOR WIRELESS COMMUNICATION



This provides a brief overview of Space-Time Coded Systems, and in particular Space-Time Block Coding.

ABSTRACT

Public interest in wireless communications has soared due to recent technological advances in the communications industry. This interest has quickly turned into a multi-billion dollar market in technologies such as pagers, mobile phones, cordless phones, laptops with wireless modems, and 4th floor Oberle Tower Balmatta Mangalore 0824-4261407 ,9886271407 raghav@goalitsolutions.com4th floor Oberle Tower Balmatta Mangalore 0824-4261407, 9886271407

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wireless local area networks. Sharing the limited available spectrum among these different high capacity users is highly dependant on signal processing techniques such as coding and modulation. The rapid growth in mobile computing and other wireless data services is inspiring many proposals for high-speed data services. Thus the next generation of mobile communications technologies will require more efficient coding, modulation, and signal processing techniques. One such proposed technique is Space-Time Coding.

A Space-Time Coded System utilizes multiple transmit and receive antennas to increase the information capacity of a wireless communications system. This is achieved by a coding scheme that introduces temporal and spatial correlation into signals transmitted from different antennas, in order to provide diversity gain at the receiver without sacrificing bandwidth. Unlike single antenna systems where scattering is a problem, it becomes a bonus, and indeed is necessary for the system to work.



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