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# Abstracts

Sl. No.	Titles	Abstract
01	Application Of Kalman Filter For Data Fusion In Multi-Sensor Environment Of Underwater And Ship Surveillance System	<p>Submarines and Ships of this era are equipped with multi sensors (hull mounted array, towed array etc.) making them contemporary in tracking multi targets in underwater environment. This paper explicates Data Fusion algorithms, based on multi-sensor target data of platforms in the formation at sea. Two-dimensional tracking is comprehended using Modified Gain Bearings only Extended Kalman Filter in each available channel. In this approach, each sensor employs one estimator to extract a state vector and its associated covariance matrix from its respective sensor measurements. Each channel output is transmitted over a data link to fusion centre, where track-to-track correlation and state vector fusion are performed ensuing composite target state vector. Sonar data Pre-processing diminishes the noise amplitude, obtains variance of the noisy data, inserts missed bearings with estimated bearings and provides estimated bearings in case of missed or incorrect bearing measurements.</p>
02	Selective Suspension Of Transmission For Avoiding Priority Reversal In Mobile Ad Hoc Networks (MANETS)	<p>Studies of ad hoc wireless networks are a relatively new field gaining more popularity for various new applications. In these networks, the Medium Access Control (MAC) protocols are responsible for coordinating the access from active nodes. These protocols are of significant importance since the wireless communication channel is inherently prone to errors and unique problems such as the hidden-terminal problem, the exposed-terminal problem, and signal fading effects. This scheme is to perform a priority scheduling in wireless ad-hoc networks, with full utilization of the bandwidth available, mitigating the loss of packets incurred by the mobility of the nodes in the network. Here, two narrow busy tone packets are used to indicate the notification of a transmission by a high priority node, thus resolving the contention of the channel. Courtesy Piggybacking scheme exploits the channel dynamics and stochastic traffic features to alleviate the conflict. The basic idea is to let the high priority traffic help the low priority traffic by sharing unused residual bandwidth with courtesy.</p>
03	Equivalence Between Two Document Images Through Iterative Histo Analysis Of The Conventional Entropy Values	<p>The text on a null background in a document image causes 0-1/1-0 transition points which are the energy spots in a document image. The energy transitions can be quantified through a conventional entropy index [8,13]. This novel idea has been utilized to test the equivalence between two document images without reading/OCRing the contents [8,13]. The basic limitation is that the entropy values remain invariant between two document components (paragraph at coarse level, line at medium level, word at fine level) even if the rows/columns are subjected to permutation. In this research work it is proposed to devise an OCR-less procedure to detect the equivalence between two documents by testing the equivalence between the corresponding components from the two document images at various hierarchical levels (paragraph at coarse level, line at medium level, word at fine level), in terms of measuring the frequencies of entropy values at different levels employing regression based frequency histo analysis [9,10]. An iterative divide and conquer strategy is employed to discriminate between the two document components at word level if the two components are rows/columns permuted. At the termination of iterative process in the worst case a frequency histo tends to become a spatial histo. Though the computational cost could appear high in the worst case, one should observe that this is an OCR-less procedure and this enables probing only in case equivalence between two components at fine level (word) is suspected to be very high.</p>
04	A Novel Algorithm For Clustering Of Wireless Mobile Ad-Hoc Networks Using Graph Domination	<p>Mobile Ad Hoc Networks (MANET) consists of nodes that move freely and communicate with other nodes via wireless links. One way to support efficient communication between nodes is to develop wireless backbone architecture. In the literature various Graph domination techniques were used to construct this virtual backbone. A new variant of dominating set which is more suitable for clustering MANET's is the K-Hop Paired-Dominating set. A cluster here is defined to be the set of vertices that are dominated by a pair of vertices in the paired-dominating set. Partitioning the network into minimum number of paired-dominating set with double star topology is a polynomial time approach</p>

as it is related to the type of finding a maximum matching in a given network. In this paper, a new approach of partitioning the network into clusters, each of which is isomorphic to double star topology, having a Master, a Proxy Master, and a set of slaves. The time required to determine the cluster heads depends on the matching of the underlying graph. The simulation of the required model prove that this proposed algorithm has better performance and provides better cluster connectivity.

05 Framework For Testing  
Fault Tolerance

Today every organization is completely dependent on computer software. In such scenario, reliable computing is expected to the software. Many promising techniques have been grown providing fault tolerance capacity to the software systems. Fault tolerance techniques provides base for reliable computing. Therefore, it is highly required that the techniques should be come in use after testing process. In this paper, a framework testing fault tolerance technique has been proposed. The framework is generic in nature. During testing, techniques must satisfy the basic properties of the fault tolerance. The framework may be used to validate fault tolerance techniques.

06 Texture Based Feature  
Analysis Using New Particle  
Swarm Optimization In  
Digital Mammograms

Breast screening programs attempt to detect and eradicate cancer at the earliest possible stage to reduce the rate of mortality amongst women. However, detecting the early signs of breast cancer that appear in X-ray mammograms presents a significant challenge to radiologists, because such signs are often difficult to distinguish against the dense or highly textured breast anatomy. In this paper Texture based Feature Analysis using Particle Swarm Optimization (PSO) and New Particle Swarm Optimization (NPSO) algorithm is used for feature selection. The selected features are fed to support Vector Machines for classification and the Receiver Operating Characteristic (ROC) analysis is performed to evaluate the performance of the feature selection methods with their classification results.

07 Novel Methods To Show  
The Temporal Diversity  
Benefit Offered By Spread  
Signatures

Spread signatures have been proposed for wireless communication to achieve higher temporal diversity benefit. Spread signatures overlap with each other but are still orthogonal to each other. In this paper, we propose three novel methods to show the temporal diversity benefit of spread signatures. In the first method, the channel has been simulated using FFT method. A stream of symbols is assumed to pass through one realization of the channel. The probabilities of error are compared for ordinary and spread signatures. In the second method also, the channel has been simulated using FFT method. The gaussians required in FFT method have been modeled as realizations of binomial random variables thus giving a finite set of channel realizations. The probability of error has been computed for every realization for both ordinary and spread signatures. The distributions of probability of errors for ordinary and spread signatures are compared. It is noted that the spread in the probability of error is less for spread signatures than for ordinary signatures. In the third method, the channel has been modeled as an AR process. Here we attempt to provide a mathematical proof to show the benefit of spread signatures. Expressions for mean and variance of probability of error have been developed. The variance in probability of error is expected to be lower for spread signatures.

08 A Novel Layer Based  
Location Management  
Scheme For Mobile Ad Hoc  
Network

Classical routing algorithms proposed within the MANET working group of IETF were basically route based, and thus constrained by certain limitations due to the need for the establishment and maintenance of routes. Recently, a family of routing protocols has been proposed as a potentially scalable solution for mobile ad hoc networks. These protocols are location-based; i.e., the network maintains nodes' geographic locations (as opposed to routes) and uses this information to route packets. A critical issue for location-based routing protocol is the management of location information. In this paper, first we have discussed some of the location service schemes that are already available. Next, we have carried out the systematic design of Layered Square Quadrant (LSQ) location management scheme with the effective implementation of the major location management functions in order to reduce the cost associated with them. For this scheme we have incorporated the layered square architecture and have applied the concept of multi-level location information. The analysis part of this paper illustrates that through this scheme we have been able to achieve a good asymptotic bound for the orthogonal costs associated with the major location management functions.

09 Energy Efficient Location Estimation In Wireless Sensor Networks

The recent advances in radio and embedded system technologies have enabled the proliferation of wireless micro-sensor networks. In wireless sensor networks, estimating nodal positions to form a coherent picture of the environment they are sensing is important for routing efficiency and location-based services. Traditional methods of providing this information, such as GPS, fall outside the cost, power and processing constraints of these networks. There are mainly two types of localization algorithms. The Range-based localization algorithm has strict requirements on hardware, thus is expensive to be implemented in practice. The Range-free localization algorithm reduces the hardware cost. However, it can only achieve high accuracy in ideal scenarios. In this paper, we locate unknown nodes by incorporating the advantages of these two types of methods and propose a new algorithm Received Signal Strength based Modified Centroid Localization (RMCL) algorithm to accurately estimate the nodal positions. The algorithm uses a small number of anchor nodes with known locations that provide points of reference from which the sensors' locations are computed. Simulation results show that the algorithms improve the localization accuracy when compared with previous algorithms.

10 Secured E-Mail Transaction In Portfolio Management

Here we develop multi party authentication protocol to be employed in stock market trading, in which the investors get information and purchase share. Information are connected in a multi party setup where in the dual signature is generalized. The earlier models developed in the portfolio analysis is based on the assumptions which are unrealistically simple. We have to add a few more assumptions to have a model on option pricing so as to have e-business transactions. Non-parametric and computational methods of option pricing have recently attracted attention of researchers. We consider the independence of the assumptions of continuous-time finance theory. We give the entire transaction process which involves the basic protocols designed in secured email-transaction.

11 Normal Algorithmic Realization Of Cellular Automata (Lecture Series – 12)

With subsets of a free monoid treated as sets of configurations of cellular automata, the notion of a normal algorithm admits to be treated as a kind of means of realizing various cellular automata. As a concrete step in this direction, we provide in this section certain techniques of realizing cellular automata using normal algorithms. More specifically, we workout a method of characterizing all one-dimensional, N-ary valued three neighborhood cellular automata by means of a normal algorithm  $N^{1N3CA}$  over an appropriate alphabet, and all two-dimensional, N-ary valued five and nine neighborhood cellular automata by means of a normal algorithm  $N^{2NrCA}$ , where  $r = 5$  or  $9$ .