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Titles	Page Number
Multi-Nets: New Trends In Neural Networks <i>Claudio Moraga</i>	011
Penta Logic Simulation <i>D. Venkat Reddy, E. G. Rajan</i>	018
Three Radial Artery Pulse Sensor Design For Siddha Based Disease Diagnosis <i>S. Mahesh, M. Manivamman, T. Anandan</i>	019
Improved Genetic-Fuzzy System For Breast Cancer Diagnosis <i>P. Ganesh Kumar, D. Devaraj</i>	024
An Effective UWB Localization Approach For Precision Automobile Parking System <i>Gerardine Immaculate Mary, V. Prithiviraj</i>	029
A Wide Bandwidth Fast Locking CMOS Delay Locked Loop For System On-Chip Applications <i>S. Moorthi, D. Meganathan, N. Ammasai Gounden, J. Raja Paul Perinbam</i>	033
Synthesis Of DSP Circuits For Low Power Using Multiple- V_{dd} , Gate-Level Sized And Optimal- V_t Library <i>Sudip Roy, Arundhati Jana, Ajit Pal</i>	037
Support Vector Machine With RBF Kernel Based On Intrusion Detection Data <i>M. Govindarajan, R. M. Chandrasekaran</i>	042
Design And Analysis Of An Expert System For Automatic Flood Control <i>Achintya Das, Sudarshan Nandy</i>	048
Reduction Of Generator Rotor Oscillations Using A Meta-Heuristic Optimization Technique <i>A. Jeevanandham, K. Thanushkodi</i>	054
Automated Template Based Region Classification Of Ultrasound Abdominal Images <i>Naveen Aggarwal, Nupur Prakash, Sanjeev Sofat</i>	061
A Novel Approach To Extract Hidden Features of Ultrasound Imageries <i>G. Sathya, G. Prashanthi</i>	66
Extracting Patterns From The Distributed Data Sources In Open Networks: An Agent Approach <i>G. S. Bhamra, A.K.Verma, R. B. Patel</i>	067
Formulation Of Multiple Feature Sets For Application In Neural Network Based Assamese Character Recognition <i>Kandarpa Kumar Sarma</i>	075
Land Surface Temperature Retrieval In A Mining Area Using LANDSAT TM5 <i>P. M. Rao, Sujatha Pallemoni</i>	082
Cellular Automata And Their Realizations (Lecture Series – 11) <i>E. G. Rajan</i>	086

Abstracts

Sl. No.	Titles	Abstract
01	Multi-Nets: New Trends In Neural Networks	The term “Multi-nets” has been coined to denote networks of neural networks, which for complex problems achieve better performance than a good single neural network and represent an active area of NN-research. The main types of multi-nets as well as the algorithms for their design will be presented. A discussion on latest developments and applications will conclude the paper.
02	Penta Logic Simulation	The penta logic switching functions are simulated using normal binary logic circuits.
03	Three Radial Artery Pulse Sensor Design For Siddha Based Disease Diagnosis	The roots of diagnostic techniques in Indian medical systems lie in the three radial pulses. In this paper we present design and analysis of a pulse sensor using PVDF material for acquiring the three pulses from the radial artery. Sensitivity analysis of the design is also presented. The sensors are firmly held at each of the three radial points and by varying the pressure on the sensor head the recordings were done on 10 healthy subjects who had no history of cardiovascular disease. The shapes of the pulses were analyzed using amplitude and frequency analysis and accordingly classified the subjects as vata, pitta and kapha type. Further we can also find that the pulses are varying over time from morning, afternoon, to evening. Establishing that the three pulses provide information about the psychic characteristics is difficult and it requires long term comprehensive, comparative research in to both modern medicine and Indian medicine. As the pulse diagnosis assumes an enormous significance in several alternative medical systems and the present work is a preliminary investigation to study the basis.
04	Improved Genetic-Fuzzy System For Breast Cancer Diagnosis	Breast cancer diagnosis is an important real world medical problem. Fuzzy Rule Based System (FRBS) has been successfully applied to many medical diagnosis problems. An important issue in the design of FRBS is the formation of fuzzy if-then rules and membership functions. This paper presents a Improved Genetic Algorithm (IGA) approach to obtain the optimal rule set and the membership function. Advanced genetic operators are applied to improve the performance of the GA in designing the fuzzy classifier. The performance of the proposed approach is demonstrated using Wisconsin breast cancer data available in the UCI machine learning repository. From the simulation study, it is found that the proposed IGFBS produces a fuzzy diagnostic system, which has minimum number of rules and whose classification accuracy is better than the results reported in the literature.
05	An Effective UWB Localization Approach For Precision Automobile Parking System	Extensive research work is being carried out to develop the Ultra-Wideband (UWB) technology for communication applications and to resolve the practical challenges in implementing an efficient UWB communication system utilizing UWB impulse radio for precision localization. In this paper a scheme is devised for the implementation of the proposed system for precision automobile parking application. The proposed UWB impulse radio system consists of a tag for transmitter and fixed nodes provided with transceiver. The TDOA (Time Difference of Arrival) technique is utilized for localization due to its inherent advantages. Wavelet Denoising (WD) is applied in time delay estimation between two spatially separated nodes in the presence of noise. The UWB signal transmitted by the tag to neighbouring nodes is sine wave burst instead of a Gaussian process which hinders their usage in several practical applications. Tests measurements are conducted using Impulse Radio UWB transceiver test setup. The TDOA values are measured for different positions of tag and reference nodes. An iterative Davidon-Fletcher-Powell (DFP) algorithm is utilized for position estimation and the results are compared with the position estimation obtained using the Direct Method (DM) by hyperbolic navigation. The DFP algorithm gives improved precision due to its iterative nature.

- 06 A Wide Bandwidth Fast Locking CMOS Delay Locked Loop For System On-Chip Applications
- This paper describes a fast lock delay locked loop for wide range of operation. The design proposed here does not use any LC tank circuit and ring oscillator and hence it is intended for ASIC design. The phase detector used is of dynamic mode and can operate in high frequency applications. Delay units used in the voltage controlled delay line are designed using a combination of clocked inverter and a simple inverter. The VCDL operates up to a frequency of 320 MHz with current mirror scheme to source and sink current corresponding to DC value of control voltage. TSPICE simulation of the delay locked loop design was done using TSMC 0.35 μ m at a supply voltage of 3.3V CMOS technology. At the maximum operating frequency of 100 MHz the period jitter and cycle to cycle jitter are 5ps and 13ps respectively. The power dissipation is about 14mW.
- 07 Synthesis Of DSP Circuits For Low Power Using Multiple- V_{dd} , Gate-Level Sized And Optimal- V_i Library
- This paper presents a low power design technique by multiple supply voltage scheduling at high-level synthesis integrated with single optimal- V_i and sizing scheme during logic synthesis. To minimize the total power under timing constraint, the supply voltage for modules in the critical path of the DFG is kept high for the used technology (for example, 1.8V for 0.18 micron technology) and the supply voltage for the other modules in the noncritical paths are selectively assigned with different lower supply voltages. We have used four different supply voltages (0.8V, 1.2V, 1.5V, 1.8V) for the modules. During high-level synthesis, after multiple supply voltage assignment the optimized gate-level module libraries have been used for each supply voltage. On an average, using this technique 77.46% total power reduction is obtained for some data and control flow intensive DSP benchmark circuits.
- 08 Support Vector Machine With RBF Kernel Based On Intrusion Detection Data
- Text Mining is around applying knowledge discovery techniques to unstructured text is termed knowledge discovery in text (KDT), or Text data mining or Text Mining. Support vector machines methods to support relatedness measurement among data. We propose in this paper a support vector classifier that performs cross validation for original support vector classifier with Radial Basis Function (RBF) kernel. The benefit of the proposed approach is demonstrated by means of data set like intrusion detection in computer networks. It is shown that, the accuracy with proposed support vector was in average around 28.6 % greater than with the original support vector machine with RBF kernel. This algorithm is independent of specific data sets so that many ideas and solutions can be transferred to other classifier paradigms.
- 09 Design And Analysis Of An Expert System For Automatic Flood Control
- Modern civilization becomes at a loss quite often during natural calamities. One of the prevailing and annihilating disasters is Flood. It is the cause of death of many leaving creatures and utter destruction of important assets and belongings. Flood like disaster is a matter of serious concern to individuals and government. This paper reviews the present manual system with its various difficulties at the time of flood especially in India and its territories, and appropriate remedies by logical reasoning based expert system. Proper control and management of the disastrous situation demands various parametric information be available to various relief agencies and to the Government. As a solution, a system is proposed, so that actual occurrence of the flood can be detected and decided on the basis of real time data analysis. The efficacy of the present work is that it offers an Expert system for automatic flood detection in the river basin. The logical reasoning based expert system uses two incoming data which are water and silt or sediment levels from river monitoring system (RMS) for real time detection and decision of river basin condition.
- 10 Reduction Of Generator Rotor Oscillations Using A Meta-Heuristic Optimization Technique
- A classical lead-lag power system stabilizer is used for demonstration in this paper. Initially single first-order phase compensation block is considered. The stabilizer parameters are selected in such a manner to damp the rotor oscillations. The problem of selecting the stabilizer parameters is converted to a simple optimization problem with an eigen value based objective function and it is proposed to employ tabu search algorithm and simulated annealing for solving optimization problem. The objective function allows the selection of the stabilizer parameters to optimally place the closed-loop eigen values in the left hand side of the complex s-plane. Stability is confirmed through eigen value analysis and simulation results.

- The B-mode ultrasound scans are one of the low cost methods to diagnose various vascular and abdominal diseases. But the quality of ultrasound images is strongly affected by the presence of speckle noise. As Speckle noise is multiplicative in nature, so homomorphic filtering is found to be best suited to reduce such a noise from the images. This paper presents a two stage approach to classify the ultrasound abdominal images. During first stage, images are segmented into different portions. To segment out the region for the learning purpose, improved marker-controlled watershed segmentation algorithm is used. But this normally results in over segmentation. This over segmentation problem is solved by defining the internal markers on the image using morphological operations. All the regions segmented out in this step are stored in the database along with their statistical properties for ensemble of images of a particular patient. In second stage, different segments in the database are defined as regions by marking their boundaries. In this stage, the medical expert can improve the efficiency of the system by rejecting the incorrect detections. Finally, a neural network is designed to classify these regions as organs and diseases tissues. All the classified regions are appropriately labelled as per the other details stored in the database. It is observed that the efficiency of whole system depends upon the efficiency of learning stage. Although the computational complexity of system is very high during learning stage, but it is relatively very less during implementation stage. The overall efficiency of the system is found to be very good in terms of precision and recall parameters.
- Given an ultra scanned image, one can extract hidden features of it using the method given in this paper. Figure 1 shows the image obtained using an ultra sound scanning system. Figure 2 shows the histogram based equalized image. Figure 3 shows the result of applying Γ -function ($n=4$) to the negative of figure 2. Figure 4 shows the histogram of figure 1 and figure 5 shows the histogram of figure 3.
- Many of the pervasive distributed computing environments are due to the advancement in computing and communication over wired and wireless networks. Many such environments have different distributed sources of voluminous data and multiple computing nodes. Data Mining (DM) technology designed for distributed applications is required to analyze and monitor these distributed data sources. Distributed Data Mining (DDM) considers the DM in a broader context where it pays careful attention to the distributed resources of data, computing and communication in order to consume them in a near optimal fashion. Distributed applications often download large amount of server resident information over a network, process it, and generate comparatively small amount of result data. If these applications are instead written using mobile agents (MAs), the agents can execute on server and access server data without using the network. Only the result data is carried back over the network for presentation to the user. Thus, the bandwidth requirements of the application can be saved. In this paper, we present a Mobile Agent based Distributed Data Mining System (MADDM) to extract some trends or patterns representing the knowledge from the Distributed Pattern Databases on Heterogeneous Network. The focus is on creating basic mechanisms and leaving policy choices to application developers. Platform for Mobile Agent Distribution and Execution (PMADE) is used for the implementation. The main reason behind the use of PMADE is that it supports large scale multi-agent system & simplifies the application development and deployment by freeing the application developer of all low-level details including communication, security and scheduling.
- The feature vector represents a unique set of data providing relevant information regarding shape, size, morphology etc of characters. Lower correlation between the samples is key in case of a neural network based character recognition system. The feature set, therefore, must have lower correlatedness between the samples. A properly formulated feature vector maximizes the performance during the training stage of a neural network based Optical Character Recognition (OCR) system and provides better classification and recognition results subsequently. Normally, mean square error (MSE) and classification performance are taken to be the performance criteria to measure the extent of proper training of an MLP used as a classifier. The work
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describes the formulation of multiple feature types used for neural network based character recognition in Assamese- an important language in the North Eastern part of India. The aim is to minimize redundancy among training samples and components of the feature vector, but at the same time improve their robustness and invariance to shape and size in presence of noise

15 Land Surface Temperature
Retrieval In A Mining Area
Using LANDSAT TM5

Typical land cover types in a mining area include forest, agricultural lands, water land, dumping area, water bodies, exposed coal bed etc. These land use types affect the distribution of Land Surface Temperatures (LST) over the mining area. This study revealed temperature in coal mining area is relatively more than surrounding areas because of exposed coal surface and coal dust and vegetation abundance have negative influence on the temperature.

16 Cellular Automata And
Their Realizations
(Lecture Series – 11)

Regardless of the nature of operations, however, the general approach is to scan a given 2-D array by a 3x3 window and update all the pixel values with the computed ones, the computations involving the coefficients of the window and those of the image pixels scanned by it. But, there are occasions when one can carry out a required operation using a simple *pattern matching and updating* technique instead of computing update values from an expression involving the window coefficients and the corresponding image pixel values. Thus, pattern-directed array processing techniques play an important role in the image processing practice where high-throughput image understanding systems are deemed. Digital images are represented as symbolic array configurations, and are processed using pattern-directed schemes of Generalized Markov Algorithms.