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1.

Authors: Anubhuti Khare, Manish Saxena, Neha Parmar

Paper Title: Satellite Communication Networks Performance

Abstract: A number of serious consortiums develop satellite communication networks. The objective of these communication projects is to service personal communication users almost everywhere on earth. The inter satellite links in those projects use microwave radiation as the carrier. Free-space optical communication between satellites networked together can make possible high-speed communication between different places on earth. Some advantages of an optical communication system over a microwave communication system in free space are 1) smaller size and weight, 2) less transmitter power, 3) larger bandwidth, and 4) higher immunity to interference. The pointing from one satellite to another is a complicated problem due to the large distance between the satellite, the narrow beam divergence angle, and vibration of the pointing system. Such vibration of the transmitted beam in the receiver plane decreases the average received signal, which increases the bit error rate.

Keywords: Laser communication, optical networks, satellite optical communication, vibrations.

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2.

Authors: Anubhuti Khare, Manish Saxena, Bhagawati Patil

Paper Title: Voice Data Compression and Decompression

Abstract: An efficient and minimum hardware implementation for the Voice data compression and decompression will be presented in this paper. Voice data compression and decompression is about a process which reduces the data rate or file size of digital audio signals. This process reduces the dynamic range (withoutchanging the amount of digital data) of audio signals [1]. The Huffman coding is used to have lossless audio compression. Very High Speed Integrated Circuit Hardware Description Language (VHDL) is used for to code the Huffman encoder and decoder and Actel's ProASIC kit is used for hard ware implementation of it. This system is minimal model of real time audio compression and decompression system.

Keywords: FPGA, VLSI, ADC, Huffman Coding.

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3.

Authors: **Anubhuti Khare, Manish Saxena, Vijay B. Nerkar**

Paper Title: **ECG Data Compression Using DWT**

Abstract: Although digital storage media is not expensive and computational power has exponentially increased in past few years, the possibility of electrocardiogram (ECG) compression still attracts the attention, due to the huge amount of data that has to be stored and transmitted; the amount that grows (depending upon the sampling rate, quantization levels and number of sensors) at the rate of 7.5-540 KB per minute per patient, depending upon the time and amplitude, sampling rate and number of sensors.
Besides the increased storage capacity for archival purposes, ECG compression allows real-time transmission over telephone networks, economic off-line transmission to remote interpretation sites, improves Holter monitor systems and enables efficient ECG rhythm analysis algorithms. A wide range of compression techniques based on different transformation techniques like DCT, FFT; DST & DCT2 were evaluated to find an optimal compression strategy for ECG data compression. Wavelet compression techniques were found to be optimal in terms of compression.

Keywords: ECG, Compression, DCT, DWT, CR and PRD

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4.

Authors: **Anubhuti Khare, Manish Saxena, Pravin J Chaudhari**

Paper Title: **Signal Code Modulation for Broadband Wireless Systems**

Abstract: This paper seeks to present ways to eliminate the inherent quantization noise component in digital communications, instead of conventionally making it minimal. It deals with a new concept of signaling called the Signal Code Modulation (SCM) Technique. The primary analog signal is represented by: a sample which is quantized and encoded digitally, and an analog component, which is a function of the quantization component of the digital sample. The advantages of such a system are two sided offering advantages of both analog and digital signaling. The presence of the analog residual allows for the system performance to improve when excess channel SNR is available. The digital component provides increased SNR and makes it possible for coding to be employed to achieve near error-free transmission

Keywords: SCM, Hybrid Modulation, Quantized residual amplification.

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5.

Authors: **Mohd. Shahnawaz, Ashish Ranjan, Mohd Danish**

Paper Title: **Temporal Data Mining: An Overview**

Abstract: To classify data mining problems and algorithms we used two dimensions: data type and type of mining operations. One of the main issue that arise during the data mining process is treating data that contains temporal information. The area of temporal data mining has very much attention in the last decade because from the time related feature of the data, one can extract much significant information which can not be extracted by the general methods of data mining. Many interesting techniques of temporal data mining were proposed and shown to be useful in many applications. Since temporal data mining brings together techniques from different fields such as databases, statistics and machine learning the literature is scattered among many different sources. In this paper, we present a survey on techniques of temporal data mining.

Keywords: Temporal Data; Temporal Data Mining; TDM Task; Temporal Sequence Mining.

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6.

Authors: **Anubhuti Khare, Manish Saxena, Heena A Jain**

Paper Title: **Next Generation Micro-power Systems**

Abstract: Emerging micro-systems such as portable and implantable medical electronics, wireless micro-sensors and next-generation portable multimedia devices demand a dramatic reduction in energy consumption. The ultimate goal is to power these devices using energy harvesting techniques such as vibration-to-electric conversion or through wireless power transmission. A major opportunity to reduce the energy consumption of digital circuits is to scale supply voltages to 0.5V and below. The challenges associated with ultra-low-voltage design will be presented. These include variation-aware design for logic and SRAM circuits, efficient DC-DC converters for ultra-low-voltage structuring to support extreme parallelism. This paper also addresses micro-power analog and RF circuits, which require the use of application specific structures and highly digital variation-aware architectures.

Keywords: Micro-System, SRAM, RF Circuit

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7.

Authors: **Sanjay Sharma, P. S. Patheja, Akhilesh A. Waoo, Rahul Gour**

Paper Title: **A Survey on Different Security Techniques of Mobile Code**

Abstract: Mobile agents are software which moves autonomously through a computer network with aim to perform some computation or gather information on behalf of its creator or an application. In the last several years, mobile agents have proved its numerous applications including e-commerce. In most applications, the security of mobile agents is a burning issue. There are plenty of techniques to protect mobile code. There need a brief discussion about each method including strength and limitation so it may guide to choose best techniques for individual application. This paper presented a overview of various security techniques with their strength and limitation. This article presents comparison of different aspects of mobile code security, namely the protection of hosts receiving a

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malicious mobile code and the protection of a mobile code within a malicious host.

Keywords: Security, Mobile agents, Mobile code, malicious host, Electronic commerce.

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	Authors:	**Dipak R.Pardhi, Akhilesh A.Waoo**
	Paper Title:	**An Efficient Ranking Based Clustering Algorithm**

8.

Abstract: There are several databases, which contain large information about research publications in various fields, for examples, DBLP in computer science and PubMed in medical science. US Census data set which contains information with 68 categorical attributes, which is very complex to get the information. Zoo data set which having information with 17 attributes, Plant Cell Signalling data set which describes the interactions of the nodes within the plant signalling network by considering 43 different attributes. Each such database forms an immense size of information network connecting in very complex ways.

In this work, we are proposing an approach for "information network mining" on such a database. We consider DBLP as an example.The database contains information about research papers, authors, conferences and journals. It also includes the date, year and the place of publication of particular journals and conferences. Various users have very specific personalized search criteria for profiling such patterns and verifying the interest, we are proposed an algorithm RBC_A, so that- (1) In-depth information about research, such as the clustering of conferences due to their sharing of many common authors can be categorized; (2) The reputation of a conference can be evaluated; finally (3) Time relevant information can be inferred. The above have been addressed in the design and development of this work.

Keywords: Information Network, Data Mining, Profiling, Ranking, Clustering, Classifications, Associations, User interface

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	Authors:	**Ashwini Waoo, Swati Khare, Sujata Ganguly**
	Paper Title:	**Unconventional Plant-based Remediation Technologies for Soil pollution at Contaminated Sites in Bhopal**

Abstract: The purpose of this study was to emphasize the Vegetation-enhanced bioremediation or phytoremediation plan for the surroundings of industrial area of Bhopal. This regions contain many industries and therefore there is a big risk of environmental pollution which is very hazardous to our health.

Heavy metal accumulation in agricultural soils is potentially hazardous to human and livestock health. Excessive accumulations also present the risks of elevated heavy metal uptake by crops which could affect food quality and safety.

Conventional remediation technologies are used to clean the vast majority of metal-polluted sites but they also tend to be clumsy, costly, and disruptive to the surrounding environment. In contrast, plants are known to sequester certain metal elements in their tissues and may prove useful in the removal of metals from contaminated soils. Over the past decade there has been increasing interest for the development of plant-based remediation technologies which have the potential to be low-cost, low-impact, visually benign, & environmentally sound, a concept called phytoremediation.

Efforts should be made for dense vegetation of heavy metal bioaccumulation plants at the industrially contaminated sites. So that they reduce pollution and also give eco friendly aesthetic sense to enhance the beauty of the Bhopal city.

Growing and, in some cases, harvesting plants on a contaminated site must be compulsory condition to setup or run a specific industry because this remediation method is an aesthetically pleasing, solar-energy driven, passive technique that can be used to clean up sites with shallow, low to moderate levels of contamination. This technique can be used along with or, in some cases, in place of mechanical cleanup methods.

This paper attempted to provide a brief review on recent progresses in research and practical applications of phytoremediation for soil. Numerous plant species have been identified and tested for their traits in the uptake and accumulation of different heavy metals. Mechanisms of metal uptake at whole plant and cellular levels have been investigated. Progresses have been made in the mechanistic and practical application aspects of phytoremediation. They were reviewed and reported in this paper

Keywords: Phytoremediation, Heavy Metals, Soil pollution, Contaminated Site, Phytoextraction, Rhizofiltration, phytostabilization, phytovolatilization

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Authors: **K. Prahlada Rao, D. P Girish, M. Krishna, Madhu. B. V**

Paper Title: **Thermal Mismatch Stresses in a Metal Matrix Composite - A Finite Element Analysis**

Abstract: The coefficients of thermal expansion (CTEs) of aluminum and aluminum/Al2O3 metal matrix composites (MMCs) are measured using a dilatometer and analysis of residual thermal stresses by Finite Element Analysis (FEA). The MMCs were prepared by liquid metallurgy technique for varying percentages of reinforcement in steps of 0, 5, 10, and 15% by weight. The CTE is expected to vary with relative residual strains which in turn are dependent on the percentage of reinforcement when cooled from 500□C to room temperature. The experimental CTE values were compared with developed model. FEA has been used to investigate the distribution of residual thermal stresses in the interfacial region. The result indicates that the properties of the interfacial region affect the stress distribution.

Keywords: Al 6061, CTE, FEA, Liquid Metallurgy, TMA

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11.

Authors: **Anubhuti Khare, Manish Saxena, Shweta Tiwari**

Paper Title: **Multimedia networks based Dynamic WCDMA System Proposal for QoS**

Abstract: In WCDMA 3rd Generation (3G) systems although there is no need for frequency planning as the case with second generation (2G) systems, the limitation of both capacity and coverage by the interference level in the system rendered the planning task for 3G systems far more complex than 2G systems. As the 3G radio networks now more sensitive to radio environment and traffic conditions, the advantage of dropping frequency planning could be cumbersome due to difficulties linked to what is called Cell-Breathing Phenomenon (CBP). In this work we propose a Dynamic WCDMA system that adjusts the spreading factor adaptively to overcome this problem. The simulation design will have the output of mapping the network load in terms of the number of users to the Eb/N0 required; this will give the network controller an idea about the number and type of users that may cause coverage to shrink i.e. start cell breathing. Therefore the network controller will be able to decide on the number and type of users admitted to the network at specific times.

Keywords: D-WCDMA, Coverage, cell breathing, Multimedia services

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12.

Authors: **Basil Hamed, Walid Issa**

Paper Title: **A Modified Internal Model Control for Unstable – Time Delayed System**

Abstract: A new approach of control design of internal model controller is proposed in this paper. The proposed design method focuses on modifying the old general structure of IMC and develops a new model structure while saving the same general concept of using the invertible version of the system in the controller design. The new approach combines the IMC structure and the traditional structure of a control problem and this demonstrates an excellent performance and behavior against different disturbance inputs and model uncertainty presented in model parameter mismatch. Beside that a smith predictor is added to promote the design to compensate the delayed time systems. Also a proposed stabilizer has mentioned to deal with unstable systems.

Keywords: IMC, Unstable, Time Delay, Pendulum System, Smith predictor.

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Authors: **Pramodini DV, AG Ananth, HM Mahesh**

Paper Title: **Study of the Performance of 3x3 MIMO Transmission System Using MMSE and Ml Detectors**

Abstract: Analysis of full-rate linear and space-time block code for 3X3 multiple-input multiple-output (MIMO) communication systems under a Rayleigh flat-fading environment has been carried out. The design targets specifically use a Linear Minimum Mean-square Error (MMSE) and Maximum Likelihood (ML) receivers which minimizes the average Symbol error rate (SER) for a QPSK transmitted signal. The optimization problem is solved by minimizing a lower bound of the SER. The performance of MIMO systems has been studied by changing the number of transmitters and receivers. A comparison has been made between MMSE and ML receivers in terms SER as a function of SNR. The simulation results show that the higher MIMO system exhibits a SNR~4 dB improvement for ML receiver in comparison to linear MMSE receiver.

Keywords: MIMO, MMSE, ML, QPSK, SER, SNR.

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14.

Authors: **Manish Kansal, Hardeep Singh Saini, Dinesh Arora**

Paper Title: **Designing & FPGA Implementation of IIR Filter Used for detecting clinical information from ECG**

Abstract: This paper describes an approach to design and implementation of digital filter algorthims based on field programmable gate arrays (FPGAs).The advantages of FPGA approach to digital filter implementation include higher sampling rates than are available from traditional DSP chips, lower cost than ASIC for moderate volume applications An ECG is a simple and useful test which records the rhythm and electrical activity of the heart of the patient that suffers from any heart disease

While recording ECG signal it gets corrupted due to different noise interferences and artefacts. Noise and interference are usually large enough to obscure small amplitude features of the ECG hat are of physiological or

clinical interest. The bandwidth of the noise overlaps that of wanted signals, so that simple filtering cannot sufficiently enhance the signal to noise ratio...We have used MATLAB for this purpose as it is the most advanced tool for DSP applications. Also it helps to verify the design and results that comes from the hardware.

Keywords: FIR, IIR, FPGA,Mat lab, VHDL.

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15.	**Authors:**	**Sandeep Patil, Shailendra Dewangan**
	Paper Title:	**Neural Network-based Offline Handwritten Signature Verification System using Hu's Moment Invariant Analysis**

Abstract: Handwritten signatures are considered as the most natural method of authenticating a person's identity (compared to other biometric and cryptographic forms of authentication). The learning process inherent in Neural Networks (NN) can be applied to the process of verifying handwritten signatures that are electronically captured via a stylus. This paper presents a method for verifying handwritten signatures by using NN architecture. Various static (e.g., area covered, number of elements, height, slant, etc.) [1] and dynamic (e.g., velocity, pen tip pressure, etc.) signature features are extracted and used to train the NN [2]. Several Network topologies are tested and their accuracy is compared.

Although the verification process can be thought to as a monolith component, it is recommended to divide it into loosely coupled phases (like preprocessing, feature extraction, feature matching, feature comparison and classification) allowing us to gain a better control over the precision of different components. This paper focuses on classification, the last phase in the process, covering some of the most important general approaches in the field. Each approach is evaluated for applicability in signature verification, identifying their strength and weaknesses. It is shown, that some of these weak points are common between the different approaches and can partially be eliminated with our proposed solutions. To demonstrate this, several local features are introduced and compared using different classification approaches.

Keywords: Handwritten Signature Verification (HSV), Hu's moment invariants, Neural Networks (NN), offline, Signature Recognition, etc.

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16.

Authors: **Kavita Mahajan, M. R. Vargantwar, Sangita M. Rajput**

Paper Title: **Classification of EEG using PCA, ICA and Neural Network**

Abstract: The processing and analysis of Electroencephalogram (EEG) within a proposed framework has been carried out with DWT for decomposition of the signal into its frequency sub-bands and a set of statistical features was extracted from the sub-bands to represent the distribution of wavelet coefficients. Reduction of the dimension of the data is done with the help of Principal component analysis and Independent components analysis. Then these features were used as an input to a neural network for classification of the data as normal or otherwise. The performance of classification process due to different methods is presented and compared to show the excellent of classification process. These findings are presented as an example of a method for training, and testing a normal and abnormal prediction method on data from individual petit mal epileptic patients.

Keywords: ANN. DWT, Electroencephalogram (EEG), Independent components analysis (ICA), Principal component analysis (PCA),

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17.

Authors: **Anubhuti Khare, Manish Saxena, Jagdish Patel**

Paper Title: **FPGA Based Efficient Implementation of Viterbi Decoder**

Abstract: It is well known that data transmissions over wireless channels are affected by attenuation, distortion, interference and noise, which affect the receiver's ability to receive correct information. Convolutional encoding with Viterbi decoding is a powerful method for forward error detection and correction. It has been widely deployed in many wireless communication systems to improve the limited capacity of the communication channels. In this paper, we present a Spartan XC3S400A Field-Programmable Gate Array efficient implementation of Viterbi Decoder with a constraint length of 3 and a code rate of 1/3. The Viterbi Decoder is compatible with many common standards, such as DVB, 3GPP2, 3GPP LTE, IEEE 802.16, Hiperlan, and Intelsat IESS-308/309.

Keywords: Convolutional encoder, FPGA, Register Exchange, Spartan XC3S400A Board, Viterbi decoder.

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18.

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Paper Title: **Distributed Routing Simulation for Generic Network-on-Chip Topologies**

Abstract: Networks-on-Chip (NoC) is recently proposed as an alternative to the on-chip bus to meet the increasing requirement of complex communication needs in Systems-on-Chip (SoC). Most researchers advocate the use of traditional regular networks like meshes as architectural templates which gained a high popularity in general-purpose parallel computing. However, most SoC platforms are special-purpose tailored to the domain-specific requirements of their application. They are usually built from a large diversity of heterogeneous components which communicate in a very specific, mostly irregular way. In such systems the size and nature of cores may vary quite widely making the topology irregular. Moreover regular topologies can become irregular due to faults in links and switches. In such scenario topology agnostic routing algorithms are generally required. In this paper, we have analyzed the performance and applicability distributed table based routing for irregular NoC on an Network-on-Chip simulation framework.

Keywords: Distributed routing, Interconnection networks, NoC, SoC.

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