



IDHAYA ENGINEERING COLLEGE FOR WOMEN

CHINNASALEM-606 201, KALLAKURICHI DISTRICT, TAMIL NADU, INDIA.

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S.NO	TITLE OF THE PAPER	NAME OF THE AUTHOR	DEPARTMENT OF THE AUTHOR	ISSN NO
1.	Spectral studies on inclusion complexation between 3-hydroxyflavone and 2-Hydroxypropyl- β -cyclodextrin	Dr.A.Praveena	S&H	-
2.	Improvement in Secure Mosaic Image using Style Transfer	S. Jayaprakash	CSE	ISSN 1311-8080 (printed version) ISSN 1314-3395 (on-line version)
3.	Challenges in integration of Digital Imaging and Wireless Communication	S.Prabakaran	CSE	1076-5131
4.	A survey on plant phytopathology and disease management	Sr.Maria Anand Milani	IT	1076-5131
5.	Multi Key Word Query Interface for Search Engines	R.Govindan	CSE	1076-5131
6.	Image In painting in MRF Framework	P.Mohanavalli	CSE	1076-5131
7.	Recognition of human actions from arbitrary views using negotiable lexicon learning	S. Jaya Prakash	CSE	1076-5131
8.	Recognition of human actions from arbitrary views using negotiable lexicon learning	P. Poovizhi	ECE	1076-5131
9.	Research of Network Vulnerability Analysis Based on Attack Capability Transfer	A. Joseph Selva Kumar	IT	1076-5131
10.	Blockchain in Internet of Things:Challenges and Solutions for smart home applications	Sr.J.Arockia Jaya	CSE	1076-5131
11.	Cryptanalysis of a Chaotic Image Encryption Algorithm Based on Information Entropy	A.George Arokiaraj	IT	1076-5131
12.	A Novel Weighted Particle Swarm Optimization (WPSO) Technique for Breast Cancer Tumor Detection using Image Processing	Sr.Catherina Mary	ECE	1076-5131


DR. R. GURUMANI, M.E., Ph.D., M.B.A., M.ISE., P.H.D.
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13.	Nulling Of Inter Block Interference in MIMO-OFDM Systems using Interference Alignment and Alamouti Scheme	V.Dhivya Priya	ECE	1076-5131
14.	Nulling Of Inter Block Interference in MIMO-OFDM Systems using Interference Alignment and Alamouti Scheme	K.Solaiyammal	ECE	1076-5131
15.	VLSI Implementation using FFT Processor with Optimized LUT Sharing	M.Revathi	ECE	1076-5131
16.	Analysis of DGS in reconfigurable Antenna for wireless Applications	Dr.S.A.Amutha Jeevakumari	ECE	1076-5131
17.	Analysis of DGS in reconfigurable Antenna for wireless Applications	W.Selvi	ECE	1076-5131
18.	Identification of Nutrient Deficiencies in Plant Leaf Using Probabilistic Neural Network	Sr.Catherina Mary	ECE	1076-5131
19.	Adaptive equalization for underground acoustic signals and channel estimation	K.Mohana	ECE	1076-5131
20.	Adaptive equalization for underground acoustic signals and channel estimation	A.Ruby Roselin	ECE	1076-5131
21.	An Efficient Techniques for PAPR reduction in OFDM Systems	A.Safana AmalaYazhini	ECE	1076-5131
22.	Performance Enhancement of PV System Using Luo Converter and FLC Based P&O MPPT	M.Benitta Mary	EEE	1076-5131
23.	IOT Based Smart Automatic Shopping Cart with Overload	A.Yogarani	EEE	1076-5131
24.	Various Industrial applications of Catalysts	D.Santhiya	S&H	1076-5131
25.	Content based geographic image retrieval using local vector pattern	Dr.Sr.A.Jenitta	ECE	1678-4324
26.	Type-2 Fuzzy Shortest Path based on distances	R.Mala	S&H	1076-5131

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Spectral studies on inclusion complexation between 3-hydroxyflavone and 2-Hydroxypropyl- β -cyclodextrin

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ABSTRACT

3-hydroxy-2-phenylchromen-4-one (HF) is a flavonols that is formed when hypoxanthine is attached to a ribose ring (also known as a ribofuranose) via a β -N₉-glycosidic bond. Cyclodextrins are able to form host-guest complexes with hydrophobic molecules given the unique nature imparted by their structure. As a result, these molecules have found a number of applications in a wide range of fields. The inclusion complex of HF with 2HP- β -CD is prepared by various synthetic method such as physical method (PM), kneading method (KM) and co-precipitation method (CP). The solid inclusion complex is characterized by UV, luminescence spectra, Fourier transform infrared (FT-IR) spectroscopy, scanning electron microscopy (SEM) and powder X-ray diffraction (XRD). The anticancer activity of the solid complex is performed against breast cancer cell line and it is noticed that there is no much better activity than the HF alone. Both the HF and its solid complex showed the poor anticancer activity against MDA MB 231 cell line.

Keywords: 3-Hydroxyflavone; 2-Hydroxypropyl- β -Cyclodextrin; Inclusion Complex; XRD; Cytotoxicity

1. Introduction

3-Hydroxyflavone is a chemical compound. It is the backbone of all flavonols, a type of flavonoid. It is a synthetic compound, which is not found naturally in plants. It serves as a model molecule as it possesses an excited-state intramolecular proton transfer (ESIPT) effect^[1] to serve as a fluorescent probe to study membranes for example^[2] or intermembrane proteins^[3]. Although 3-hydroxyflavone is almost insoluble in water, its aqueous solubility (hence bio-availability) can be increased by encapsulation in cyclodextrin cavities^[4]. Recently some of the research work is carried out in HF by some other authors. Complex formation of HF in γ -CD medium and their excited state proton transfer (ESPT).

Cyclodextrins (CDx) are cyclic oligosaccharides formed from D-glucose units that provide a relatively hydrophobic binding site for guest molecules. The most common CDx have six (α), seven (β), or eight (γ)

glucose units for which the internal cavity diameter varies between 5 to 8 Å^[5-7]. The CDx have been widely employed as host molecules in supramolecular chemistry, since the size of their cavities can be systematically varied and the hydroxyl groups at both rims can be derivatized^[8]. In addition, CDx are chiral, and this property has been explored for separation technology^[9] and in the study of the complexation of various guests. Guest molecules can interact with different regions of the CDx, and different inclusion modes have been observed, e.g., inclusion within the cavity or binding to the rim. Cartoon representations frequently show an inclusion mode where the guest is located deeply within the CDx cavity, a perception that probably arises from the fact that the cavity is relatively hydrophobic. The inclusion complexation of guest molecules by the host cyclodextrins (CDs) and chemically modified cyclodextrins has been extensively studied in recent years as models of biological receptor-substrate

IMPROVEMENT IN SECURE MOSAIC IMAGE USING STYLE TRANSFER

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Abstract: A secure transmission of Secret image is proposed in which the style image is the target image that is used for mosaic image creation. Style image is obtained by the mixture of two images using the Texture Synthesis process. To improve the quality of Style image Dual Domain Filter (DDF) is used. Mosaic image is created by dividing the secret image and target image into fragments of equal size and fitting these secret tile blocks into target blocks. Embed tile fragments into the target image based on the mapping sequence generated by the Genetic Algorithm and permute the sequence again by KBRP with a key. Color transformations and rotation are performed to make the mosaic image similar to the target image. For the recovery of the secret image from the mosaic image embed relevant information into the created mosaic image. By using the same key and the mapping sequence, the secret image can be recovered.

Keywords: Image hiding, Mosaic image, Genetic Algorithm, Style transfer, texture synthesis, image segmentation, Dual Domain Filter, Key Based Random Permutation, Color Transformation.

1. Introduction

Style transfer is the process of converting a style from one image (the Style Image) to another (the Content Image) that is used to synthesize a new image which is an artistic mixture of content and style. The use of novel style transfer algorithm that relies on the texture synthesis work of Elad et al[3] is applied.

Positive feature is that if Elad's algorithm is applied to an empty content-image it reduces gracefully to be Kwatra's classic texture synthesis algorithm. The results obtained using Elad et al. are visually pleasing but it is of not much quality while keeping the style essence of the content intact. The demanding part in the computational complexity is the patch-matching that takes place in the very last full-resolution iterations.

Image enhancement and reconstruction are important tasks in image processing. Images are degraded by additive white Gaussian noise, by arbitrary

method noise or compression artifacts. To improve these images specialized tools are often developed for each type of degradation. The bilateral filter (BF) and its variant, the joint-bilateral filter have become popular tools due to their simplicity and effectiveness in removing named artifacts. Knaus et al.[10] algorithm is used for enhancing the image quality. The style image is sent to a Dual-Domain Filter (DDF) which is a simple but powerful image denoising filter.

Both Dual Domain Image Denoising (DDID) and DDF combine in both spatial and transform domains. Intuitively, the two steps compensate the weaknesses of each other: the bilateral kernel masks out high contrast edge and the local Fourier transforms detect and preserve low-contrast repetitive structures that the bilateral kernel would tend to blur away.

DDF interprets bilateral filtering and wavelet shrinkage as robust noise estimators in two different domains. Durand and Dorsey have already made the connection of the bilateral filter to robust statistics, but they did not consider the bilateral filter as a robust noise estimator. Their approach is also related to a more recent work of Knaus and Zwicker called Progressive Image Denoising (PID), where the connection of wavelet shrinkage to robust estimation of noise differentials. The iteration in PID, requires many small steps. In contrast, with DDF we obtain better results in only few iterations. The processed image is considered as the Target image and it is useful for transmitting the secret image through the internet for variety of applications. These images contain confidential or private information. Therefore, such information should be protected from leakages while transmitting through internet.

Different methods have been proposed for secure image transmission. The proposed technique is based on Surya et al.[23] where the style is applied to the target image in addition to that of processing. The two common approaches for secure transmissions are image encryption and data hiding. Data hiding that hides a secret data into a cover images. So, no one can recognize the existence of the secret data on the cover image. In this the data type of the secret message

Challenges in integration of Digital Imaging and Wireless Communication

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Abstract:Recent advances in Digital Imaging Technology combined with the next generation digital wireless communication has great potential to transform the paradigm for how humans will communicate visual information with one another in the next century. The first major change is that the model of one message from a single source to many clients will be replaced by a model of many messages from multiple sources to many receivers (peer to peer). A second major change is that the model will move from a passive client, which only receives messages to an interactive client able to respond and even direct the information content to itself. This will have great impact in the experience of Visual Communication in the next decade. In this paper, we shall outline some of the key technological challenges in terms of bandwidth, processing power, data rate, data sizes and human factors required to influence this paradigm shift resulting from the merger of digital imaging and digital wireless communication technologies.

Keywords: Digital Imaging, Human Visual System, Wireless Communication, JPEG, MPEG, ACELP.

I. Introduction

Both Imaging and Wireless technologies are undergoing massive changes as they traverse through the transformation from analog to digital technology basis. Merging these technologies is leading to even greater changes in applications such as Internet Videocasts, Digital TV, Digital VCR, Direct Satellite Broadcasting, Video Conferencing, etc. In this paper, we shall examine some of the challenges this new paradigm presents. One trend is that more authors of images and videos will appear due to the decreasing cost of access as well as reduction in user expertise because of increasing technical sophistication of the tools. A second trend is that the audience of this video streams will interact more with the content and demand more control over the experience. The control will come both in terms of what content is experienced, but also where and when that experience has occurred.

Visual information is popular because it is our highest bandwidth sense, able to convey the equivalent of megabytes per second of data to the observer. In addition, visual information is not in general bound by the constraints of a language. A picture of an apple is recognized by anyone who has seen an apple previously, irrespective of the language the person speaks. Much the same holds for graphics, schematics and other visual representations, which transcend language and so aid in communication.

Though a valuable adjunct to speech and text messaging, visual communication does impose certain burdens. In the remainder of this paper, we will first examine the special requirements imposed by visual communication and briefly discuss the technological trends and challenges. In Section 2, we discuss the fundamentals of the human visual system as it relates to digital imaging. We describe the

A Survey on Plant Phytopathology and Disease Management

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Abstract - Diseases in plants are quite natural, but the people who likes and have interest on the plant get disappointment when it becomes diseased or damaged. Diseases can affect at any part of plant. It is very hard to observe the plant diseases manually. So we need a fast, automatic, accurate way. Various methods are used to detect and categorize plant diseases from digital images. This paper presents survey on Common plant diseases, symptoms and its control and techniques to detect plant pathologies.

Key Words : *Blight, Rhizoctonia, Erwinia stewartii,*

I. INTRODUCTION

Plants become an important source of energy and only a primary source to the problem of global warming. The detection of plant disease is a very important factor to prevent serious disruption as plant disease. Plant diseases can be infectious or non-infectious. Non-infectious diseases are usually referred to as disorders. Common plant disorders are caused by non-pathological conditions such as poor light, unpleasant weather, water-logging and lack of nutrients also affect the functioning of the plant system. Physiological disorders are distinguished from plant diseases caused by pathogens, such as a virus, fungus Bacteria, nematodes, mycoplasmas and viroids. Nematodes are the largest of these agents, while viruses and viroids are the smallest. None of these pathogens are visible to the naked eye, but the diseases they cause can be detected by the symptoms of wilting, yellowing, stunting, and abnormal growth patterns. There are several ways to detect plant pathologies. Some diseases do not have any visible symptoms associated, or those appear only when it is too late to act. In those cases, normally some kind of sophisticated analysis, usually by means of powerful microscopes, is necessary. A common approach in this case is the use of remote sensing techniques that explore multi and hyperspectral image captures. The methods that adopt this approach often employ digital image processing tools to achieve their goals.

II. COMMON PLANT DISEASES

2.1Blight

Agrios (1) defines blight as “a disease characterized by general and rapid killing of leaves, flowers, and stems.” Thus, blight is not a specific disease caused by a specific organism, but rather it is a general term encompassing numerous hosts infected by a variety of bacterial and fungal pathogens

2.11Fire Blight

Fire blight is a destructive, highly infectious and widespread disease caused by the bacterium *Erwinia amylovora*. This bacterial disease affects apples, pears, fruit trees, roses, and small fruits. Leaves on diseased shoots often show blackening along the midrib and veins before becoming fully necrotic. The Symptoms include, bark at the base of blighted twigs becomes water soaked, then dark, sunken and dry; cracks may develop at the edge of the sunken area. Young twigs and branches die from the terminal end and appear

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Multi Key Word Query Interface for Search Engines

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Abstract- Keyword search is an efficient data retrieval method for the WWW, largely because the simple and efficient nature of keyword processing allows a large amount of information to be searched with fast response. However, keyword search methods do not formally capture the clear meaning of a keyword query and fail to address the semantic relationships between keywords. As a result, the accuracy (precision and recall rate) is often unsatisfactory, and the ranking algorithms fail to properly reflect the semantic relevance of keywords. Our research particularly focuses on increasing the accuracy of search results for multi-word search. We propose a statistical ontology-based semantic ranking algorithm based on sentence units, and a new type of query interface including wildcards.

Key words- Wild cards, Ranking, Semantic, query

I. INTRODUCTION

Presently the keyword searching is efficient in the searching methodology due its high efficiency. But it does not provide a semantic understanding of the keywords because it is difficult to find the exact meaning of the keyword without considering the semantic relations of the word or without knowing the full context of the sentence. At the same time the search results are not convincing. When a user is searching some information in the search engine, if the information that is being searched is not highly ranked, then the user may search the information again and again with a new query rather than clicking through the next pages. This happens because the existing ranking algorithms do not map the semantic relevance between the query and the web contents. In this paper we introduce a new query interface which keeps one or more tags between keywords or at the beginning or at the end of a query. This will allow search engines to return exactly what the user is searching in an efficient way. For example, if a user searches about the price of a car, then the user has to place a query of price, {tag}, and car. This new query interface calculates the frequency of occurrence of the keyword in the position of tag as relevant to actually what the user is looking for.

The main objective of the research is to increase the accuracy of search results measured by means of recall rate and precision. For this we propose a new query interface having a tag and ontology based semantic ranking. In first phase we provide high ranking to the keywords present in same sentence rather than the keywords in different sentences. While existing statistical search algorithms such as N-gram [1] only consider sequences of adjacent keywords, our approach is able to calculate sequences of non-adjacent keywords as well as adjacent keywords. In the second phase we propose a query interface which considers the tag as an independent token of a search query to relate to what actually the user is searching. Unlike the existing information retrieval approaches such as proximity approaches, semantic and natural language assisted search approaches [2, 3], statistical language modelling, query prediction and query answering, our approach helps in improving information retrieval efficiently.

II. RELATED WORKS

The most important factors which current search engines, including Google, adopt to determine their ranking results for multi-keyword search are frequency and proximity [4, 5]. One of the main problems with the current ranking algorithm of multi-word search arises from the fact that its methodology calculates the relevance of keywords only by their proximity without considering whether they exist in the same sentence or not. For this reason, this method fails to consider the possibility that multiple neighbouring keywords have no relevance to each other, for example, when one word is placed at the end of the first sentence, and the other in the beginning of the second sentence. Another problem is that even when multiple keywords are semantically closely relevant, if other words such as modifiers are inserted between them, the current ranking methodology calculates their relevancy as low. The other problem is that this methodology cannot successfully recognize semantic differences between multiple keywords whose orders are reversed, for instance, dog eat and eat dog. To overcome these problems, the following technologies have been introduced.

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Image in Painting in MRF Framework

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Abstract— This paper presents a Markov random field (MRF)-based image in painting algorithm using *patch selection* from groups of similar patches and *optimal patch assignment* through *joint patch refinement*. In patch selection, a novel group formation strategy based on subspace clustering is introduced to search the candidate patches in relevant source region only. This improves patch searching in terms of both quality and time. We also propose an efficient patch refinement scheme using higher order singular value decomposition to capture underlying pattern among the candidate patches. This eliminates random variation and unwanted artifacts as well. Finally, a weight term is computed, based on the refined patches and is incorporated in the objective function of the MRF model to improve the optimal patch assignment. Experimental results on a large number of natural images and comparison with well-known existing methods demonstrate the efficacy and superiority of the proposed method.

Keywords— In-painting, subspace clustering, higher order singular value decomposition, Markov random field.

I. INTRODUCTION

IMAGE in painting techniques generate visual information in the target region (also called unknown or missing region) of an image so that the in painted image becomes visually pleasant. Two major applications of image in painting techniques are image restoration (e.g., scratch and blob removal from old photograph) and image editing (e.g., text or undesired object removal). These methods may be broadly classified into two categories: (i) diffusion-based methods for structure propagation, and (ii) exemplar-based methods for texture synthesis. In diffusion-based methods [1]–[4] information is smoothly propagated inward the missing region from its boundary. These methods use partial differential equation (PDE) to propagate linear structures along the x direction. PDE based methods are efficient for mostly thin target region (e.g., scratch) surrounded by smooth region. On the other hand, for the texture images, these methods may create a blurring effect due to the smoothing term.

The basic idea of exemplar or patch-based methods is to fill the target region by copying the well-matched source patches (i.e., candidate patches from the source region) to the corresponding target locations. Initially, this idea was employed for texture synthesis [5], [6] for super resolution imaging. Later, Criminisi et al. [7] combined this approach with patch priority to devise an exemplar-based image in painting method, where structure propagation is ensured by choosing the target patch lying on the structure for filling up first based on priority value. This work is further improved in [8]–[10] by modifying patch priority and patch similarity measures. Compared to diffusion-based approach, exemplar-based methods usually produce visually better result for blob type target region. These methods are greedy in nature as the target patches are inferred sequentially. So the error in patch inference at any stage is propagated till end. Komodakis et al. [11] solve this problem with MRF-based global optimization method which assigns an optimal patch to each node simultaneously from multiple candidate patches depending on the node's belief. A node's belief is determined based on the target patches assigned to its neighboring nodes, and the method is known as priority belief propagation (p-BP). Recently, *context-aware* patch-based image in-painting is introduced by Ruzic et al. [12], where candidate patches are searched over the entire source region based on contextual similarity. Meur et al. [13] propose super-resolution in-painting, where in-painted target region at different scales are combined in the lower scale using MRF-based framework. Then this lower resolution in-painted image is up-sampled using single frame super-resolution technique to obtain in-painted image at the same scale as the input. Furthermore, He and Sun [14] solved image in-painting as a photomontage problem utilizing the statistics of patch offsets in MRF-based framework. This method is useful for the images having repeated objects.

Besides MRF-based methods, sparse representation is also widely used in image in-painting [15]–[18], where the target patch is inferred by sparse linear combination of a set of pre-defined patches (dictionary) or selected candidate patches. Usually searching candidate patches is a time intensive process. A fast randomized patch search algorithm called Patch-Match [19] is developed by exploiting natural coherence in the image using nearest neighbor field (NNF). Later, Darabi et al. [20] have proposed image melding to improve Patch-Match by incorporating geometric and photo metric transformations in patch inference. In [14], patch offsets are found only in the image plane, whereas planar structure based method [21] finds the patch offsets in different planes depending on translation regularity.

Recognition of Human Actions from Arbitrary Views Using Negotiable Lexicon Learning

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Abstract - Recognition of human action is essential to many practical applications such as in camera-based surveillance, in sensor network technologies to monitor an actor's behaviour along with its environment, human-computer interaction, video surveillance, video indexing and browsing, recognition of gestures, analysis of sports events and dance choreography, presence-sensor (Is there at least one person present?), person-counting sensor (How many people are present?), Location-detection (Where is each person?), Tracking (Where was this person before?), identity-detection (Who is each person?). In most cases this recognition of human activity is done from a fixed point or is done by requiring the knowledge of some view angle, which is not possible in practical applications. In this paper, we propose a framework in which a joint learning is made to view invariance lexicon dictionary and view invariance classifier. So as a result we will get a dictionary that can project real-world 2D video into view invariance lexicon dictionary and view invariance classifier to recognize the actions with a random view. The main trait of our algorithm is to use of fully-fledged data to separate view-invariance between 3D and 2D videos during the pre-training phase. So this guarantees the accessibility of training data, and it removes the problem of obtaining real-world videos at a specific viewing angles. In addition to that, for a better description of actions in 3D videos, we introduce a new property set called the 3D dense trajectories for the effective encoding of extracted trajectory information on 3D videos.

keywords—Lexicon learning, 2D and 3D video, pre-trainin, 2D dense, 3D dense

I. INTRODUCTION

2D video based recognition of human actions has attracted attention in surveillance security and human-computer interaction. There are various spatio-temporal movements that can be considered as a key of action recognition. These include spatio-temporal interest points, spatio-temporal pattern template, motion trajectories based descriptors and shape matching. In these methods, deep learning networks have achieved significant success in the 2D action recognition area the dense trajectories based methods have also achieved the result of state-of-the-art by extracting densely sampled trajectories-aligned descriptors in the optical flow fields. So, by using these methods we can automatically learn the representations of spatial temporal feature and identify the different categories of action. But there are only few effective single view-action recognition and its performance will significantly degrade when the viewpoint is changed. This results in the cross-view-action recognition. This cross-view-action recognition method is proposed for connecting the different viewpoints. Its main idea is to transfer the knowledge that we obtained from different viewpoints. So the source code view is now transferred to the target view, and this allows the system to recognize actions from a view that is not included in demo and training set. In this paper, we propose a digest of recognition of human activities and discuss their advantages and limitations.

Mostly this human action recognition word is done on the basis of certain assumption on a centric-figure of a clear background, in which the user is almost free to perform any activity. This results a classification chart with less errors. But it is a challenging task as there contains change in scale, lighting, appearance, viewpoint, clutters in background, and the resolution where the frame is kept. In addition to these difficulties there is another one main drawback when we are considering the time consuming roles of annotating behavioural as it requires the prior knowledge of the specific event that we are recording. Also there occurs the similarities between the intra and interclass which creates a new problem called amply challenging. That is, the actions that are recorded within the same class may be performed by different persons with different body movements, and thus these actions becomes more difficult to distinguish. The human behaviours were mostly depend on their habits. So this benchmarks the process of visual model learning for the evaluation process. So this becomes a challenging task.


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Research of Network Vulnerability Analysis Based on Attack Capability Transfer

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Abstract—Network vulnerability analysis is one of the important techniques to protect network security. Modeling and classification of network vulnerability are introduced firstly, then the concept of attack capability transfer and the algorithm to produce it are presented, which can aggregate vulnerabilities with the same exploitation attributes and satisfying some constrains to simplify the further analysis. Based on the attack capability transfer, a new method constructing attack graph is presented, and the complexity is $O(N^2)$ where N is the number of hosts in a network. Through the analysis of attack graph, network vulnerability quantitative analysis is taken and security hardening method based on approximate greedy algorithm is presented, the complexity of which is $O(V)$, where V is the number of vulnerabilities in a network. Experiment shows the effectiveness of the method.

Keywords—Vulnerability; Network Vulnerability Modeling; Attack Capability Transfer; Attack Graph; Network Security Hardening.

I. INTRODUCTION

Network vulnerability analysis is one of the important techniques to protect network security. Traditional methods such as firewalls, intrusion detection systems and vulnerability scanning tools are all static and passive. Network vulnerability analysis is an active defense technique, which can simulate the attacking process accurately and grasp the intention of attackers. So the research of network vulnerability analysis and security assessments is very important to improve the security of network.

In this paper, a method generating attack graph based on attack capability transfer is introduced. Compared with other models, it can aggregate the vulnerabilities with same exploitation attributes, the complexity of which is $O(N^2)$ where N is the number of hosts in a network, so it is scalable and convenient for further analysis. To assess the vulnerability of network, a quantitative analysis method and a greedy MCVS algorithm are presented. At last, a typical example is proposed to illustrate the effectiveness of the method.

The paper is organized as follows: existing analysis methods are compared. Modeling of the network and vulnerability is proposed; definition of attack capability transfer is proposed; Quantitative assessment method and minimum common vulnerability set algorithm are proposed in this paper.

II. RELATED WORK

Much work has been proposed in the network vulnerability modeling and analysis. In the field of network vulnerability modeling, attack graph is always used as a formal method. Paul Ammann proposed monotonicity assumption which stated the precondition of a given exploitation was never invalidated by the successful exploitation of another exploit, and the construction complexity of the attack graph was $O(n^5)$ where n is the number of hosts in the network. To simplify the complexity, Steven Noel proposed the concept of exploitation dependency graph, and its complexity is $O(e^2)$ where e is the number of vulnerabilities in the network. Rattikorn Hewett presented an attack graph construction and analysis method, and the attack graph construction and analysis time are $O(n^2)$. Murray characterized reviewed approaches in terms of how system performance was accounted, and interdiction scenarios for each performance class were discussed, illustrating the unique attributes of the various modeling approaches.

In the field of network vulnerability analysis, Ye Yun proposed a method of RAM (risk adjacency matrix) in , based on attack graphs to extend the visualization of attack graphs and to solve the re-computing problem caused by the rings and loops in the risk assessment. Chen Feng presented in an iterative algorithm to find all the non-loop attack paths to the key attributes with their depth less than the given number n based on attribute-based attack graphs. Kijsanayothin P. presented in systematic approaches to statically analyze attack graphs by means of reasoning mechanisms based on logical expressions, which can assist a security administrator in selecting most cost-effective countermeasures. Li Zhidong proposed an evaluation method based on threat spread analysis, and the nonlinear overlapping effects under multiple concurrent attacks were discussed to reflect the indirect threats caused by the spread of direct threats along the dependency relationship. Dinh proposed pairwise connectivity, and used it to formulate network vulnerability assessment as a graph-theoretical optimization problem. The authors proved the NP-completeness and in approximability of the problem to identify the minimum set of critical network elements. ZHANG Yong proposed an approach to improve the awareness of network security, based on the Markov Game Model (MGM) to analyze the influence of propagation on a network system and accurately evaluate system security. The MGM can dynamically evaluate system security situation and provide the best reinforcement schema for the administrator.

Blockchain in Internet of Things: Challenges and Solutions for smart home applications

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Abstract: The Internet of Things (IoT) is experiencing exponential growth in research and industry, but it still suffers from privacy and security vulnerabilities. Conventional security and privacy approaches tend to be inapplicable for IoT, mainly due to its decentralized topology and the resource-constraints of the majority of its devices. BlockChain (BC) that underpin the cryptocurrency Bitcoin have been recently used to provide security and privacy in peer-to-peer networks with similar topologies to IoT. However, BCs are computationally expensive and involve high bandwidth overhead and delays, which are not suitable for IoT devices. This position paper proposes a new secure, private, and lightweight architecture for IoT, based on BC technology that eliminates the overhead of BC while maintaining most of its security and privacy benefits. The described method is investigated on a smart home application as a representative case study for broader IoT applications. The proposed architecture is hierarchical, and consists of smart homes, an overlay network and cloud storages coordinating data transactions with BC to provide privacy and security. Our design uses different types of BC's depending on where in the network hierarchy a transaction occurs, and uses distributed trust methods to ensure a decentralized topology. Qualitative evaluation of the architecture under common threat models highlights its effectiveness in providing security and privacy for IoT applications.

I. INTRODUCTION

The Internet of Things (IoT) represents one of the most significant disruptive technologies of this century. It is a natural evolution of the Internet (of computers) to *embedded and cyber-physical systems*, "things" that, while not obviously computers themselves, nevertheless have computers inside them. With a network of cheap sensors and interconnected things, information collection on our world and environment can be achieved at a much higher granularity. Indeed, such detailed knowledge will improve efficiencies and deliver advanced services in a wide range of application domains including pervasive healthcare and smart city services. However, the increasingly invisible, dense and pervasive collection, processing and dissemination of data in the midst of people's private lives gives rise to serious security and privacy concerns. On the one hand, this data can be used to offer a range of sophisticated and personalized services that provide utility to the users. On the other hand, embedded in this data is information that can be used to algorithmically construct a virtual biography of our activities, revealing private behavior and lifestyle patterns.

The privacy risks of IoT are exacerbated by the lack of fundamental security safeguards in many of the first generation IoT products on the market. Numerous security vulnerabilities have been identified in connected devices ranging from smart locks to vehicles. Several intrinsic features of IoT amplify its security and privacy challenges including: lack of central control, heterogeneity in device resources, multiple attack surfaces, context-aware and situational nature of risks, and scale.

The following salient features of BC make it an attractive technology for addressing the aforementioned security and privacy challenges in IoT:

- **Decentralization:** The lack of central control ensures scalability and robustness by using resources of all participating nodes and eliminating many-to-one traffic flows, which in turn decreases delay and overcomes the problem of a single point of failure.
- **Anonymity:** The inherent anonymity afforded is well-suited for most IoT use cases where the identity of the users must be kept private.
- **Security:** BC realizes a secure network over untrusted parties which is desirable in IoT with numerous and heterogeneous devices.

Cryptanalysis of a Chaotic Image Encryption Algorithm Based on Information Entropy

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Abstract -- Recently, a chaotic image encryption algorithm based on information entropy (IEAIE) was proposed. This paper scrutinizes security properties of the algorithm and evaluates validity of the used quantifiable security metrics. Some common insecurity problems in the field of chaotic image encryption are found in IEAIE, e.g. the short orbits of digital chaotic system and invalid sensitivity mechanism built on information entropy of the plain-image. What's worse, each security metric is obviously questionable, undermining the security credibility of IEAIE. So, IEAIE can only serve as a counterexample for the secure and effective communication method for image data.

Keywords-- Chaotic cryptanalysis; image encryption; secure communication; privacy protection.

I. INTRODUCTION

The information entropy of the plain-image is used to build up a sensitivity mechanism of the encryption result of IEAIE on the plain-image. This paper reports security defects of the chaos-based pseudo-random number generator and the sensitivity mechanism. In addition, each used security metric is questioned from the perspective of modern cryptanalysis. The rest of the paper is organized as follows. It introduces the algorithm IEAIE and presents cryptanalysis of IEAIE by disproving security metrics used for IEAIE. The last section concludes the paper.

Recent technological maturations in the fields of communication and media exchange have made digital images indispensable mean of communication at a high pace. Images are prominently used to exchange information in areas of defense and military, multimedia-broadcasting, satellite-communication, tele-medicine, etc. These areas require ensuring security, authenticity, integrity and non-repudiation as breach of any of the factors may prove to have catastrophically devastating effects (El-Samie et al., 2013). Thus, the need for efficient and robust image communication has attracted the attention of security experts and researchers. The confusion and diffusion properties of cryptography can be related to the fundamentals of chaos like sensitivity to initial conditions, periodicity, mixing and exactness property. In chaos-based encryption methods, they provide high sensitiveness to initial conditions and parameters, thus making them apt for constructing efficient and secure image encryption. In past couple of decades, a number of studies have carried out by researcher worldwide for data like tests, image, audio, video, etc, encryption which utilized different types of chaotic dynamical systems to generate efficient and cryptographic random sequences of bits to be used as encryption key streams in stream or block cryptosystems to resist any external threat from attackers (Kocarev and Lian, 2011, Ahmad et al., 2017, Xu et al., 2016, Chai et al., 2017, Çavusoglu et al., 2017, Ghebleh et al., 2017, F. Özkaynak Brief review on application of nonlinear dynamics in image encryption Nonlinear Dynamics 1–9, 2018). With the natural instinct to use chaos to enrich the design of image cryptosystems, the dynamics of chaotic and hyperchaotic system have attracted researchers worldwide for their usage in cryptography.

The underlying architecture of many proposals suffers from serious security flaws which make them susceptible to even classical cryptographic attacks which ultimately resulted in retrieving plain image without the secret key. Image encryption proposals have been successfully cracked by security experts and attackers and were found insecure (Hermassi et al., 2012, Li, 2016, Bechikh et al., 2015, Li and Lo, 2011, Rhouma and Belghith, 2009, Ahmad, 2011, Jeng et al., 2015, Özkaynak et al., 2012, Özkaynak and Özer, 2016, Chen et al., 2017, Fan et al., 2018). An attacker targets to know a way to unveil key or plaintext in lesser time or storage than the brute-force attack (Hermassi et al., 2012). It is practiced to find weaknesses, if any, in the security system that eventually may lead to the previous results (Schneier, 1996, Bard, 2009). Breaking a cryptographic system involves an analytical study of the model and to propose a mathematical method that exploits the underlying inefficiencies. In practice, both the cryptanalysis and cryptography are two equally significant aspects of a security system. It is recommended to design against possible cryptanalysis (National Security Agency, 2017). It provides mathematical description of concepts for understanding of break.

II. RELATED WORK

Referring to area of image encryption, literature shows a variety of approaches using chaotic maps. Review some of chaos-based image encryption schemes are as follows. In (Liu and Wang, 2010), a stream-cipher algorithm depend on chaotic maps and one-time keys was designed, where the piecewise chaotic and linear map was employed to produce pseudo-random sequence of key streams. An image is encrypted by separating the pixels of image into groups of bits of different planes in Zhu et al. (2011).

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A Novel Weighted Particle Swarm Optimization (WPSO) Technique for Breast Cancer Tumor Detection using Image Processing

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Abstract-Image processing techniques are particularly used for the enhancement techniques in various applications and domains. In particularly medical applications are used to analysis for sustainable and unsustainable image quality. In this article have been analyses and prediction of the tumor detection in breast cancer. The preprocessing system are presenting for enhancement by using the noise removal, filtering and contrast enhancement methods respectively and analyzing the performance. IBCR-SBI (Intensity based Cramer Rao - Straighten Boundary Condition) mechanism was proposed for improving the processing time and accuracy for segmentation of tumor mass from breast region. To improve the accurate, detection of tumor extraction adopted Cramer-Rao mechanism which was based on the intensity of the pixel. For the further efficiency, improvisation of straighten boundary (SBI) approach is adopted for cancer edge detection. Based on WPSO, the weighted function in optimization algorithm images are clustered and extracted. Simulation result of the proposed approach is comparatively examined with existing approaches naive bayes, Adaboost and SVM.

I. INTRODUCTION

Cancer was solely associated with a typical development of a cell and body cells which divides during the endless aspects also encroach of encompassing tissue [1]. It was usually divided like "Benign and Malignant". plenty in this Benign one square measure straightforward cyst that doesn't prior of near tissues which implies that it is not benign type of cancer. In case of other type of cancer called Malignant was developed in varies elements and developed on varies organ, bone of the body. Carcinoma begins in "breast lump" that the leadings cancers diagnose on ladies.

In particularly breast cancer starts in the cells of the breast as a group of cancer cells that can then invade surrounding tissues or spread (metastasize) to other areas of the body. Breast cancer is now the most common cancer in most cities in India, and second most common in the rural areas. It accounts for 25% to 32% of all female cancers in all these cities. A survey was conducted on foreign country exhibits that 1 among the 11 women as tormented by carcinoma at some stages of their life. In the beginning stage of cancer no symptom will be found whereas in the final stage there are often modifications in breast, skin dimple, watery excretion on mammilla or reddish round patches. Early finding and proper timing medication square the sole factor leads carcinoma patient in extending there are life period. X-ray diagnostic technique was taken into account because the advantageous normal tools on finding of carcinoma detection. Whereas this method as both false and true results. This method wasn't appropriate for women those who as thick breast tissues. Applied mathematics texture model contemplate "mammographic" look has varies structures. This method as extremely less synthetic velocity and using this is not advisable widely


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Nulling of Inter Block Interference in MIMO-OFDM Systems using Interference Alignment and Alamouti Scheme

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ABSTRACT- All present communication systems are block based systems. Cyclic prefix are added in large to the OFDM block for removing inter block interference. It consumes larger bandwidth. So in this proposed system cyclic prefix length is reduced so that inter block interference can be reduced by using some techniques like interference alignment. This paper presents a detailed study of diversity coding for MIMO-OFDM systems. Different space- time coding(STBC) schemes including Alamouti's STBC for 4transmit antennas are explored. Finally these STBC techniques are implemented in MATLAB and analyzed for performance according to their bit error rates using 16QAM modulation schemes.

Index terms – cyclic prefix, interference alignment, MIMO-OFDM, Alamouti ST block coding, inter block interference.

I. INTRODUCTION

Multiple –input multi-output systems are a key component of a future wireless communication systems, because of their promising improvement in terms of performance and bandwidth efficiency.[1],[2],[3],[4],[5]. Space time block codes for multiple - input multiple – output (MIMO) channels [6] have been proposed in order to mitigate the effects of channel fades. Advantages of MIMO-OFDM systems include [7],[8]:Due to increase in symbol duration, there is a reduction in delay spread. Addition of guard band almost removes the ISI and ICI in the system. It is important to note that each antenna element in a MIMO systems operates on same frequency and therefore does not require extra bandwidth. Also, for fair comparison, the total power through all antenna elements is less than or equal to that of a single antenna system, (i.e)

$$\sum_{k=1}^N p_k \leq P \quad (1)$$

Where N is the total number of antenna elements, p_k is the power allocated through the kth antenna elements, and P is the power if the system had a single antenna element [4]. Effectively,(1) ensures that a MIMO system consumes no extra power due to its multiple antenna elements. This paper provides a brief background on MIMO systems including the system model, capacity analysis, and channel models. Focus is then given to spatial diversity, specifically to space time block codes (STBC).

We discuss Alamouti's space time block codes as well as other orthogonal STBC for 4 transmit antennas and finally show simulation result and analysis. The paper is organized as follows. In section II, important general background information on MIMO-OFDM is provided. Next, different STBC techniques are explained in section III. The simulation methodology is discussed in section IV. Result and analysis are presented in section V. Finally section VI concludes this paper.

II. MIMO –OFDM MODEL

Traditional wireless systems are affected by multipath propagation. In MIMO systems, however, this multipath effect is exploited to benefit the user. In fact, the separability of parallel streams depend on the presence of rich multipath. The reason for this effect will become apparent as the System Model is described in Section II A below.

Orthogonal frequency division multiplexing is a popular wireless multicarrier technique. The basic principle of OFDM is to split a high data rate stream into a number of low data rate stream so that the lower data rate can be transmitted simultaneously over a number of subcarriers. In OFDM, the amount of dispersion in time caused by multipath delay spread is decreased due to increased symbol duration for lower rate parallel subcarriers [9]. The spectrum of OFDM is more efficient because of the use of closer channel space. Interference is prevented by making all the subcarrier orthogonal to one another. MIMO system utilizes space multiplex by using antenna array to enhance the efficiency in used bandwidth. These systems are defined spatial diversity and spatial multiplexing.

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VLSI Implementation using FFT Processor with Optimized LUT Sharing

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Abstract Low-power design of VLSI circuits has been identified as a critical technological need in recent years due to the high demand for portable consumer electronics products. Adders and multipliers are the most important arithmetic units in a general microprocessor and the major source of power dissipation. The Fast Fourier Transform (FFT) algorithm is one of the most important algorithm. It can be used to convert the time domain signal into frequency domain. The multipliers are replaced with the Look Up Tables (LUT). The pre calculated values are stored in the Look Up Table. The shared Look-Up Table was used to reduce the number of Look Up Table. The implemented new algorithm gives an ease way to increase the number of points of FFT by imposing simpler modification. With the help of these designs, it would be possible to design highly power efficient processor with less area, especially in Digital Signal Processors.

Keyword – Fast Fourier Transform(FFT), Multiplier, Look Up Table (LUT), Shared Look Up Table.

I. INTRODUCTION

The Fast Fourier Transform (FFT) is widely used in a number of applications as it is considered to be an efficient algorithm to compute the Discrete Fourier Transform. The processor computing the FFT for large sequence real time data becomes complex and tedious. These multipliers are replaced with shared Look Up Tables (LUTs) for the direct storage of the complex computational values. Fourier transform is an efficient computational tool for manipulations of data. The Fast Fourier Transform is a method of laying out the computation, which is much faster for large values of N , where N is the number of samples in the sequence. The DFT requires $(N-1)^2$ complex multiplications and $N(N-1)$ complex additions. The FFT require $N/2 \log_2 N$ complex multiplications and $N \log_2 N$ complex additions. The Fast Fourier transform (FFT) processors have greatly increased the effectiveness of the digital technology.

The main objective of the project is to replace the multipliers with shared Look Up Table (LUT). The area, power and time are analyzes. [1] The LUT content of DA based BLMS is reduce the LUT size and LUT update complexity. Based on that we have proposed an intra-iteration LUT sharing scheme. LUT sharing Scheme it offers savings of the 60% and 77% LUT words. [5] An efficient technique for implementation of DA based filters. The DA based design uses a novel LUT sharing technique to compute the filter's output. This method involves less LUT access per output (LAPO). This method offers L (filter length) times throughput over other methods. For filter length 64, the proposed method involves 43% less LAPO and offers 5.22 times higher throughput. The major advantage is reducing area-delay product for ADF implementation of higher filter lengths. [6] A novel pipelined architecture for low power, high throughput and low area implementation of adaptive filters based on DA. LUT is updated in parallel and carry save accumulator is used for DA based inner product computation by which sampling period and area get reduced. The proposed design consumes 29% less area-delay product than conventional DA. [7] The anti-symmetric product coding (APC) and odd-multiple storage techniques for LUT design for memory based multipliers to be used in DSP. These techniques are used to reduce a size of LUT by one-fourth if conventional LUT. For higher points, it uses less area and less multiplication time. For 16-bit and 32-bit word sizes respectively, this method offers more than 30% and 50% of saving in area-delay product.

II. THE FAST FOURIER TRANSFORM

In the present scenario, several methods are available for efficiently computing the DFT, like simultaneous equation method, by correlation process and so on. One such is the Cooley-Tukey algorithm, named after J.W.Cooley and John Turkey. It is one of the most common Fast Fourier transform. It re-expresses the discrete Fourier transform (DFT) of an arbitrary composite size $N = N_1 N_2$ in terms of smaller DFTs of size N_1 and N_2 . Recursively it is repeated to reduce the computation time $O(N \log N)$ for highly composite N . The FFT computes the DFT and produces exactly the same result with high-speed computation rate speed. The most important difference is that the FFT is much faster than DFT. It is observed from Equation that for each value of k , direct computation of input $X(k)$ involves N complex multiplications (out of which $4N$ real multiplications) and $N-1$ complex additions (including $4N-2$ real additions). Consequently, for computing, all input N value of the DFT requires N^2 complex multiplications and N^2-N complex additions. Direct computation of the DFT has basically limited primarily because of its inability to exploit the symmetry and periodicity properties of the phase factor W_N .

$$\text{Symmetry property : } W^{k+n/2} N = -W^k N \quad (2.1)$$

$$\text{Periodicity property : } W^{k+nN} = W^k N \quad (2.2)$$

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Analysis of DGS in reconfigurable Antenna for wireless Applications

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Abstract: In this paper, an analysis of DGS in reconfigurable antenna is presented. Reconfigurable antennas are used to cover different wireless services that operate over a wide range of frequencies. For reconfiguration, microstrip patch antenna is used due to its advantages. To meet the requirements of wireless services, microstrip patch antenna deploying Defected Ground Structures (DGS) technique has been discussed in this paper. The DGS is used for size reduction and to achieve useful multiband by cutting different shapes of slots inside the patch. DGS are used for the purposes of rejection of unwanted frequency and to reduce the size of circuit. The proposed design of microstrip patch antenna with DGS, return loss will be relatively low and bandwidth is relatively high which is suitable for wireless Applications.

Keywords— Defected Ground Structures, Reconfigurable antenna, reconfiguration, microstrip patch antenna

I. INTRODUCTION

A reconfigurable antenna is an antenna capable of modifying dynamically its frequency, polarization and radiation properties in a controlled and reversible manner. They exhibit the ability to modify their geometries and behavior to adapt to changes in surrounding conditions. They have been used with variable and adaptable single-antenna geometry without increasing the need to accommodate multiple antennas. They are used to cover different wireless services that operate over a wide range of frequency. They exhibit many advantages over their traditional counterparts as it can be used to support multiple functions at multiple frequency bands. This will significantly reduce the hardware size and cost. Defected Ground Structure is relatively associated with antenna and printed circuit applications. The evolution of DGS from the Photonic Band Gap (PBG) structure, the basic geometries, and their analytical models are discussed. Most of the possible applications of DGS to microstrip antennas have also been discussed in this paper. In this paper, an analysis of DGS in reconfigurable antenna is presented. In chapter I, introduction of reconfigurable antennas are reported. Modelings of DGS are discussed in chapter II. Developments of DGS in microstrip antenna and conclusion in chapter IV are presented.

II. DEFECTED GROUND STRUCTURE

Defected ground structures have attracted an increasing interest due to [6,4,5,7] their simple planar structure, ease of design, and fabrication with photolithographic techniques. Unlike Photonic bandgap, a unit element of DGS can be easily modeled. The parameters of its circuit model can also be conveniently extracted from electromagnetic simulations or measured data. Furthermore, only a few unit elements of the DGS are required to achieve the same frequency response as that of a photonic band gap structure using unit cells. This property of the DGS, which results in miniaturized circuits, makes DGS very popular in the printed circuit applications. Defected Ground Structure, as the name implies, refers to some compact geometries, commonly known as a "unit cell" etched out as a single defect or in periodic configuration with small period number on the ground plane of a microwave printed circuit board to attribute a feature of stopping wave propagation through the substrate over a frequency range. Thus a DGS can be described as a unit cell EBG or an EBG with limited number of cells and a period. The DGS slots are resonant in nature. They have different shapes and sizes with different frequency responses and equivalent circuit parameters.

The presence of a DGS under a printed transmission line actually perturbs the current distribution in the ground plane and modifies the equivalent line parameters over the defected region. DGS can be classified into two categories depending on their configurations: Single unit cell DGS and Uniform or non-uniform periodic arrangement of unit cells.


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Identification of Nutrient Deficiencies in Plant Leaf Using Probabilistic Neural Network

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Abstract – Nutrients takes important role in the growth of plants. Be short of nutrients show the way to affect the growth of the plant. Physical monitoring of infection do not provide reasonable effect, as bare eye surveillance is old technique have need of more time for recognition as well need specialist, and so it is non effective. To prevail over the drawbacks of conventional eye examining technique, image processing provided rapid and precise nutrients deficiency finding of plant. The objective is to propose a novel system to find out the nutrient shortage in the affected plant from its leaf images to a large extent than the human eye could identify. Gray Level Co-occurrence Matrix (GLCM) based features are used for recognizing affected spot of the image and then it is classified using Probabilistic Neural Network (PNN). The normal RGB images are converted into YCbCr images initially for better result. Morphological based segmentation, GLCM features based disease diagnose were done with reference of relative percentages of nutrients normally needed for a plant. Feed forward neural network based classification and pattern recognition method used to investigate nutrient insufficiency of leaves and present response to the farmers which helps them to take up suitable corrective actions in time. Experiments on the plant images with nutrient deficiency symptoms show the feature extraction efficiency of 91.08% and classification accuracy reaches 89.7%.

I. INTRODUCTION

Agriculture is the most important livelihood of India, Indian top soil is self-possessed of various mineral deposits and organic elements, and so investigation has concluded that Indian top soil is composed as 99% are mineral contented and 1% of organic elements. A plant's growth depends on these mineral and organic elements present in the soil. Nutrients in the plant help to study the nature of soil in that area. The leaf is the main photosynthesis organ of plant and it has an effect on crop development and bio-productivity. Compared with other organs of plant, it contains several features such as shape, color and vein texture. Hence leaf region is the important factor in studies of plant nutrition, plant soil-water relations and plant protection measure. If a plant not receiving balanced nutrition, it can be easily affected by pests and fungus. Symptoms of pests and fungus can be traced.

Plants have need of fourteen mineral elements for typical growth and it is grouped into two categories such as Macronutrients and Micronutrients. A plant requires large amount of Macronutrients and fewer amounts of Micronutrients. Nitrogen, potassium, phosphorous, magnesium, calcium and sulfur belong to the first category. Micronutrients are iron, manganese, copper, zinc, molybdenum, boron, chlorine and nickel. A deficiency arises when a necessary element does not exist in adequate quantity to meet up the needs of the budding plant. Many techniques are used for diagnosing insufficiency of nutrients in plant leaf. But the image processing techniques are the rapid and easiest method which helps to diagnose as soon as possible.

II. LITERATURE OF SURVEY

In earlier days there were lots of models used by people to recognize nutrient deficiencies in the soil. If soil is having less amount of a specific nutrient, it must put in an appearance in the plant and by examining the physical distinctiveness of the leaf to spot its deficiency. Physical observation of disease does not provide a better end result. The image processing techniques offer a better solution for finding the disease in earlier stage. Ashwathi and Sanjana, [2] proposed a system that makes the specialist to assess the analysis results and send feedbacks to the farmers through a warning to their mobile phones.

Hiremath et al [9] proposed a way to estimate of nitrogen content in plants through software called "Nitrate app". Image of the Maize leaf is acquired and preprocessed to eliminate the noise. Maize leave features are extracted by analyzing color characteristics using the RGB and the HSV model. Features are evaluated based on entropy, contrast, energy and homogeneity values. Features of test image are compared with the database to build a correlation.

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ADAPTIVE EQUALIZATION FOR UNDERGROUND ACOUSTIC SIGNALS AND CHANNEL ESTIMATION

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Abstract - This paper deals with Processing of Acoustic signal and channel estimation. Signal processing in acoustics is based on concept of extracting critical information from noisy uncertain measurement data. To reduce the computational complexity and to improve data detection, the receiver structures are matched to physical channel characteristics and are studied. A decision feedback equalizer is designed which relies on an adaptive channel estimator to compute its parameters. Only significant components whose delay span is much shorter than the multipath spread of the channel are selected to reduce the channel estimate size. Optimal coefficient selection is performed by truncation in magnitude. And is used to cancel the post-cursor ISI prior to linear equalization.

Keywords- Decision Feedback Equalization, Channel Estimation, Adaptive Algorithm, RLS algorithm

I. INTRODUCTION

Underwater acoustic communications can be achieved by implementing spatial diversity combining and equalization of PSK signals. Due to the nature of the propagation channel, the required signal processing is often too complex. Reduction in computational complexity can be realized by using proficient adaptive equalization such as low-complexity LMS algorithms with improved tracking properties and by reducing the number of adaptively adjusted receiver parameters.

Our aim is to design a receiver structure that is matched to the physical characteristics of an underwater acoustic channel. For reduced-complexity a decision-feedback equalization method based on channel estimation is used. By tracking the channel through the equalizer coefficients, it is possible to design a receiver that uses only the significant channel components. The composite time span of these components is often much shorter than the overall multipath spread, leading to the desired reduction in complexity. In addition, elimination of unnecessary receiver parameters may lead to better performance as well as faster tracking of the channel time-variations.

II. DFE: AN ALTERNATIVE INTERPRETATION

Tap-selective equalization has been considered for communications over horizontal underwater acoustic channels where multipath spread is extremely large. An *ad hoc* sparse DFE determines the positions of significant taps by computing the full-size equalizer solution (feed forward and the feedback filter) initially, but keeping only those taps whose magnitude exceeds a pre-determined threshold. This tap selection method is not optimal, because the input signal to the equalizer is not white. On the other hand, a sequence of uncorrelated data symbols at the input to a channel estimator is white, and optimal tap selection can easily be performed by truncation in magnitude. This fact serves as a motivation for developing a channel-estimation-based equalizer.

AN EFFICIENT TECHNIQUES FOR PAPR REDUCTION IN OFDM SYSTEMS

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ABSTRACT-Communication is one of the important aspects of life. For better transmission even single carrier waves are being replaced by multicarrier signals which were initially sent in the analog domain, are being sent more and more in the digital domain. Multicarrier modulation schemes are widely used in wireless communications. Orthogonal Frequency Division Multiplexing (OFDM) is spectrally efficient multi-carrier modulation technique for high speed data channel signal transmission due to its robustness, over multipath fading channels. High peak-to- average power ratio (PAPR) has been one of the major drawbacks of orthogonal frequency division multiplexing (OFDM) systems. The aim of the project is to present the analysis to reduce the PAPR using the clipping and filtering, precoding and companding techniques are implemented for OFDM signal at transmitter. This results simulation using MATLAB shows a PAPR reduction and improvement of BER performance of the system. Also will concentrate the PAPR reduction- comparisons with different coding techniques.

I. INTRODUCTION

With the ever growing demand of this generation, need for high speed communication has become an utmost priority. Various multicarrier modulation techniques have evolved in order to meet these demands, few notable among them being Code Division Multiple Access (CDMA) and Orthogonal Frequency Division Multiplexing (OFDM). Orthogonal Frequency Division Multiplexing is a frequency division multiplexing (FDM) scheme utilized as a digital multi carrier modulation method.

A large number of closely spaced orthogonal sub carriers is used to carry data. Each sub carrier is modulated with a conventional modulation scheme (such as QPSK) at a low symbol rate, maintaining total data rates similar to the conventional single carrier modulation schemes in the same bandwidth. OFDM takes its place in the next generation of communication systems because of its high data rates and low complexity. COFDM (Coded OFDM) is a practical form of OFDM where redundant bits are into the bit stream at the transmitter.

II. PEAK TO AVERAGE POWER RATIO

OFDM is an attractive technology in wireless communication. High Peak to Average Power Ratio (PAPR) is one of the challenging issues in OFDM systems. High PAPR force the High Power Amplifier (HPA) to operate its linear region with wide dynamic range, where the power efficiency is very poor. Presence of large number of independently modulated sub-carriers in an OFDM system the peak value of the system can be very high as compared to the average of the whole system.

This ratio of the peak to average power value is termed as Peak-to-Average Power Ratio. Coherent addition of N signals of same phase produces a peak which is N times the average signal.

III. PAPR REDUCTION TECHNIQUES

A. AMPLITUDE CLIPPING AND FILTERING

Amplitude clipping is considered as the simplest technique which may be under taken for PAPR reduction in an OFDM system. A threshold value of the amplitude is set in this case to limit the peak envelope of the input signal. Signal having values higher than this pre-determined value are clipped and the Then the clipped signal is passed through a filter and transmitted. At the receiver, the reverse operations are done est are allowed to pass through un- disturbed.

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Performance Enhancement of PV System Using Luo Converter and FLC Based P&O MPPT

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Abstract—In our present scenario, solar energy is one of the quite attractive pollution free, essentially inexhaustible and broadly available renewable energy source as a future energy supply. But the main drawbacks associated with PV systems are (i) low output panel voltage (ii) low power conversion efficiency. This paper presents the use of a super lift luo converter with FLC based P&O MPP tracking control to all eviate the above said problems. Incorporation of luo converter with a PV system ensures the high step up voltage conversion with less ripples and high power density .Furthermore, to enhance the power conversion efficiency, we introduced a modified FLC based P&O MPPT .

Keywords— Photovoltaic(PV) • Fuzzy logic control(FLC) • Maximum power point tracking(MPPT) • Perturb&Observe (P&O)

I. INTRODUCTION

A PV system converts the sunlight energy into parallel electricity. PV panels are used to track the solar energy and convert into electricity. But solar panel has merely 30-40% efficiency only. The PV module also exhibits nonlinear V-I characteristic curves because of changing temperature, irradiation levels. In order to improve the efficiency, we use super lift luo converter which increases the output voltage level in power series stage by stage. Perturbation and Observation (P&O) can track the Maximum Power Point(MPP) all the time and is widely used in PV systems because of its simplicity and ease of implementation. However, it presents drawbacks such as Cellslow response speed, oscillation around the MPP in steady state and even tracking in the wrong way under israpidly changing environmental conditions. In order to overcome these drawbacks and improve theP&O tracking, this paper proposes a fuzzy based MPPT [1] technique Hence it necessitates an effective, robustcontrol approach with a goal of designing a controller andconfirming stability in every working stage of the expressedby(2):converter viz. Initial start-up, dynamic responses (line andload variations) and the effect of component variation etc.

A. PV Cell Modelling

A Solar cell is basically a p-njunction I₀device and works on the principle ofphoto-electric phenomenon. Fig. 1 represents the equivalentcircuitmodel of PV cell. This circuit includes a light generatedsource, diode, a series resistance R_s and resistance R_{sh}.

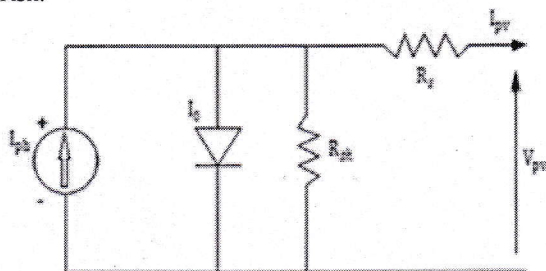


Fig. 1 Equivalent Circuit of PV

The characteristic equation for a photovoltaic cell given by(1)

$$I_{pv} = I_{ph} - I_0 \left[\exp \left(\frac{q(V_{pv} + R_s I)}{nKT} \right) - 1 \right] - \frac{V_{pv} + R_s I}{R_{sh}} \tag{1}$$

I_{ph} is

$$I_{ph} = [I_{sc} + K_1(T - T_r)] \frac{G}{1000} \tag{2}$$

The reverse saturation current depends on temperature T as fol shows:

$$I_0 = I_{rs} \left(\frac{T}{T_r} \right)^3 \exp \left[\frac{qE_g}{nK} \left(\frac{1}{T_r} - \frac{1}{T} \right) \right] \tag{3}$$

where,

I_{pv} and V_{pv} are the output current and voltage of pv cell, n is the ideality factor(1.6), k is the Boltzmann's constant (1.3x10⁻²³Nm/k), T is the cell's operating temperature in Kelvin, q is the electron charge(1.6e-19coloumbs),I₀ is the reverse saturation current and I_{ph} is photo generated current, T_r is the reference temperature, Kt is the cell's short-circuit

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IOT Based Smart Automatic Shopping Cart With Over Load

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Abstract: A shopping mall or a super market is a place where thousands of customers visit every day to purchase many products. Today purchasing various products in malls or supermarkets require a trolley. Product procurement represents a complex process. Each time customer has to pull the trolley for getting the items and placing them in the trolley and also he has to take care of expense computation. After shopping the customer has to wait in a long queue for product scanning and bill payment. To overcome this we are developing a smart way for shopping. Each and every product contains RFID tag. The smart trolley will consist of a RFID reader, transmitter. When the customer scans and places any product in the trolley, cost and the name of the product will be displayed. The sum total cost of all the products will be added to the final bill, which will be stored in the micro controller memory. It will wirelessly transfer the product information of the items placed in the trolley using a transmitter to the main computer. So, to avoid waiting in billing queue while constantly thinking about the budget.

Keywords: Smart shopping cart, RFID, Arduino UNO, Weight sensor, Android.

I. INTRODUCTION

Sometimes customers face problems regarding the incomplete information about the product and waiting at the billing counters. Hence improvement is required in the traditional billing system to improve the quality of shopping for the customers. With this system, customer will have the information about price of every scanned items and total price of the item. This system will save time of customers and manpower required in mall. The smart shopping cart integrates a shopping cart with RFID reader placed at the top of the shopping cart. It facilitates the customer to self-scan the barcode of the purchased products which he intends to purchase. If the customer wants to remove any product that can be done by scanning the product again while removing from the cart. A smart phone with an android application is used here. As soon as we are logged in, we are assigned with a trolley which we will be using throughout our shopping. An android application facilitates us to set the budget limit before we start our shopping. An android application makes note of all the scanned commodities of the particular trolley and is linked with the Supermarket's backend database which contains details of the products such as Cost Price, Available Stock. If the shopping amount reaches close enough to the budget limit or goes beyond the budget limit then the customer is notified through the same application. A customer can also increase the budget limit and set new budget limit once he is notified, or else he can generate the bill. The scanned products are automatically billed in the android application, thereby significantly reducing turnaround time. These scanned products are also transmitted to the Shop's central billing program through a wireless network. By using this mechanism, the tedious work of scanning and billing every single product at the cash counter can be avoided. A weight sensor is also integrated with the shopping cart at the bottom of it. It is just to ensure if any product is added without getting scanned, so that the extra weight in the cart can be sensed. Finally, after the shopping and bill payment the bill is sent to the customer's registered E-mail through the same app mentioned.

Development of Smart Shopping Carts with Customer-Oriented Service

The system specified here is assisted by the functionality of tablet or embedded computer. The functionality of this system is partially implemented in C language and Lab VIEW, in order to provide a smart user interface and also to establish connection between embedded computer and other accessories. The user interface here provides with the map information, product searching and also automated billing. To make the flexible designing of user interface easy the buffered state machine based on a queued message handler (QMH) is adopted. The algorithm used here for the purpose of facial recognition is LBPH (local binary patterns histograms) which is mostly used to extract the features of human face. The obtained characteristics data is then transformed into LBP data array, which is obtained from trained images. The face recognition here is basically used for the purpose of login, which would be stored in the database during the customer registration. The automated billing system is also provided here, and also the assistive information to the customers are provided. [1]

VARIOUS INDUSTRIAL APPLICATIONS OF CATALYSTS

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Abstract- Chemical transformations are essential to all living organisms and also to the manufacture of many products including fuels, plastics, and pharmaceuticals. Without catalysts and catalytic technologies, the ease of transportation and the ready access to all of the materials needed for our daily lives would not be possible. The purpose of this primer is to show why catalysts are required for biological processes as well as those used in technology for the production of most fuels, chemicals, polymers, and pharmaceuticals. As we shall see, catalysts are the ultimate enablers of chemical transformation.

Keywords: catalysts, catalyst technologies, biological process.

I. INTRODUCTION

The first time a catalyst was used in the industry was in 1746 b J. Roebuck [1] in the manufacture of lead chamber sulfuric acid. In general a catalyst is a chemical substance which increases the speed of the reaction. And many reactions without catalysts do not take place. Hence, is the utmost important to speed up the reactions in less frame of time. Since then catalysts are used in a large portion of the chemical industry. In the start only pure components were used as catalysts, but after the year 1900 multicomponent catalysts were studied and are now commonly used in the industry [1,2]. In the chemical industry and industrial research, catalysis play a vital role. In order to understand the challenges facing the application of catalysts in the fine chemicals industry, one has to recognize not only the essential industrial requirements but also how the process development is carried out, and which conditions determine the suitability of a best catalyst [1,2]. Chemical Catalysis is an essential tool for chemicals and materials production, for fuel and other energy conversion systems, for combustion devices, for fuel cells, and for pollution control systems. Often it is the key to making an entirely new technology or transmitting new life into obsolete or mature technologies. Additionally to the traditional need for productivity improvements, environmental drivers, energy saving, and industrial safety bring new aspects to the Importance of catalytic innovation [3]. Additionally, catalysis is synthetically applied to form new chemical bonds or to cleave chemical bonds (e.g., reductive alkylation of amines, hydrogenolysis of carbon-halogen bonds, cleavage of protecting groups [2, 4].

II. TYPES OF CATALYSIS

Homogenous or heterogeneous catalysis may be used for synthetic processes depending on the number of phases in which the catalytic reaction is conducted. Homogeneous catalysis is a single phase reaction commonly liquid/ liquid while heterogeneous catalysis are bi or multi-phased. The use of homogeneous catalysts has numerous advantages such as lowering of temperature of reactions and thereby saving energy. The lower temperature tends to provide greater specificity and fewer unwanted and perhaps undesirable by-products. Thus, these catalysts provide a totally benign synthesis, minimize energy cost and maximize yields and purity. One major disadvantage of the catalyst, however, is the need to separate and recover the catalyst. Two aspects of the disadvantages include the cost and the release of large amounts of heavier transition metals into the biosphere which has a lot of environmental effects (diseases and toxicity). Catalysts are compounds of very expensive metals and therefore, any significant loss would be very expensive to purchase [5]. An important aspect of heterogeneous catalysis is the synthesis of active sites through attachment of metal complexes with a given chemical composition to the support surfaces [6]. The problems of heterogeneous catalyst include: high operating temperature greatly reduce the lifetime of heterogeneous catalysts. High temperatures accelerate deactivation, reduce the selectivity of the catalysts and hamper their ability to produce high yields. Fig.1 will explain types of catalysts.


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Content Based Geographic Image Retrieval using Local Vector Pattern

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ABSTRACT

Large image archives formed by satellite remote sensing missions are getting an increasing valuable source of information in Geographic Information Systems (GIS). The need for retrieving a required image from a huge image database is increasing significantly for the purpose of analyzing resources in GIS. Content Based Geographic Image Retrieval (CBGIR) in the image processing field is the best solution to meet the requirement. In this work, we used Local Vector Pattern (LVP) to extract fine features present in the geographical image and retrieve the applicable images from a large remote sensing image database. The primary idea of our method is generating micro patterns of LVP by the vectors of each pixel that are constructed by calculating the values between the centre pixels and its neighbourhood pixels with various distances of different directions. Then the proposed method was designed for concatenating these vector patterns to produce more unique features of geographical images and comparing the results with Local Binary Pattern (LBP), Local Derivative Pattern (LDP) and Local Tetra Pattern (LTrP). Ultimately, the extensive analysis carried out on different geographical image collections proved that the proposed method achieves the improved classification accuracy and better retrieving results.

Key words: Geosciences; Geographic Information Systems; Content Based Geographic Image Retrieval; Local Vector Pattern.

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Type-2 Fuzzy Shortest Path Based On Distances

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Abstract- Type-2 fuzzy sets possess a great expressive power and are conceptually quite appealing. This paper presents Type-2 fuzzy shortest path problem on a network by similarity measure using different type of distances. The proposed method to deal with shortest path length in fuzzy environment is also presented with relevant numerical example.

Key Words- Type-2 Fuzzy set, Type-2 trapezoidal fuzzy number, Similarity Measure Distance based similarity, Footprint of Uncertainty

I. INTRODUCTION

In graph theory, the shortest path problem is the problem of finding a path between source node to destination node on a network. It has applications in various fields like transportation, communication, routing and scheduling. In real world problem the arc length of the network may represent the time or cost which is not stable in the entire situation, hence it can be considered to be a fuzzy set.

The fuzzy shortest path problem was first analyzed by Dubois and Prade[4]. Okada and Soper [9] developed an algorithm based on the multiple labeling approach, by which a number of nondominated paths can be generated.

The Similarity concept is extremely important, for it provides the degree of similarity between two fuzzy concepts. Since Zadeh[11] presented the similarity relation concept, similarity measures between fuzzy sets have been widely studied and applied in various areas. Hence fuzzy similarity measure [3,5] was utilized to get the shortest path in the case of trapezoidal fuzzy number. However, type-1 fuzzy weights are not good enough. For this situation, we need type-2 fuzzy weights instead of type-1 fuzzy weights to show the variations.

The concept of a type-2 fuzzy set was introduced by Zadeh [12] as an extension of the concept of an ordinary fuzzy set. Such sets are fuzzy sets whose membership grades themselves are type-1 fuzzy sets; they are very useful in circumstances where it is difficult to determine an exact membership function for a fuzzy set; hence, they are useful for incorporating uncertainties.

This paper is organized as follows: In section 2 we have some basic concepts required for analysis. Section 3, gives an algorithm to find the shortest path and shortest path length from source node to destination node using type-2 trapezoidal fuzzy number. Section 4, gives the network terminology. To illustrate the proposed algorithm the numerical example is solved in section 5. An comparative study is made with the help of various distances like Hamming distance, Normalized Hamming and Euclidean distance. Finally in section 6, conclusion is also included.

II. CONCEPTS

A. Type-2 Fuzzy Set

A Type-2 fuzzy set denoted \tilde{A} , is characterized by a Type-2 membership function $\mu_{\tilde{A}}(x, u)$ where $x \in X$ and $u \in J_x \subseteq [0,1]$.


ie., $\tilde{A} = \{((x,u), \mu_{\tilde{A}}(x, u)) / \forall x \in X, \forall u \in J_x \subseteq [0,1]\}$ in which $0 \leq \mu_{\tilde{A}}(x, u) \leq 1$. \tilde{A} can be expressed as

$$\tilde{A} = \int_{x \in X} \int_{u \in J_x} \mu_{\tilde{A}}(x, u) / (x, u) \quad J_x \subseteq [0,1], \text{ where } \int \int \text{ denotes union over all admissible } x \text{ and } u. \text{ For discrete}$$

universe of discourse \int is replaced by \sum .

B. Interval Type-2 Fuzzy Set

Interval type-2 fuzzy set is defined to be a T2FS where all its secondary grade are of unity for all $f_x(u) = 1$.


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