GRAPHICAL PASSWORD AUTHENTICATION

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Abstract: **For the authentic users, password is the main choice in the computer system for the privacy terms. "Username" and "password" is the most authentic terms in the computer system. Alphanumeric is generally used for the authentication. It is notable that passwords are at risk to assault, clients will in general pick passwords that are anything but difficult to recollect, and this implies they are additionally simple for an assailant to accomplish via scanning for applicant passwords. On the other hand, if a password is hard, then it is much difficult to remember by the users and difficult to attackers to attack.**

Graphical passwords may give the security which are preferred over content that are based on passwords in light of the fact that numerous individuals are trying to retain content based passwords and plain words are utilized. Textual passwords are used instead of pictures because humans can remember pictures more easily than characters. In graphical user interface, graphical password is an authentication system picture selected by user is the parameter this is required for working by a graphical password which is an authentication system. That's why, the graphical password approach is called graphical user authentication.

Keywords---Authentication, Computers, passwords, security, Graphical.

I. INTRODUCTION

A form of authentication which is graphical password authentication demands the recall and selection of an images or points in an image inputted during the registration stage in a graphical user interface. Passwords give security to validation and insurance of administrations against not wanted access to assets. A graphical based secret phrase is one reasonable option of literary passwords. The most common authentication method in computers used today is alphanumeric usernames and passwords. This method has many disadvantages. Clients will in general pick important passwords that are simple for assailants to figure out, however solid framework allotted passwords are troublesome to get recall for the clients. Utilizing a graphical secret phrase, clients click on pictures instead of alphanumeric characters. Today, the most secure form of

authentication is biometric based but the problem with biometric is that they are not economical to use but an alternative which is more secure and less expensive is the use of graphical passwords.

Preferred security is given by graphical passwords that are based over content on the grounds that numerous individuals those who are trying to remember content based passwords, which are utilized by plain words. Graphical passwords use pictures rather than literary passwords and are incompletely spurred by the way that people can recall pictures more effectively than alphanumeric characters. A graphical secret key is a confirmation framework that works by having the client select from pictures, in a particular request, displayed in a graphical UI. That is the reason the graphical secret phrase approach is called graphical client verification.

II. CATEGORIES

A. Techniques which are based on recall

A client is approached to repeat something that he made or chose before amid the enlistment arrange.

Scheme of Draw-a-Secret (DAS)

Clients draws a straightforward picture on a 2D framework, the directions of the lattices involved by the pictures are put away in the request of illustration. Redrawing needs to contact similar matrices in a similar grouping in confirmation.
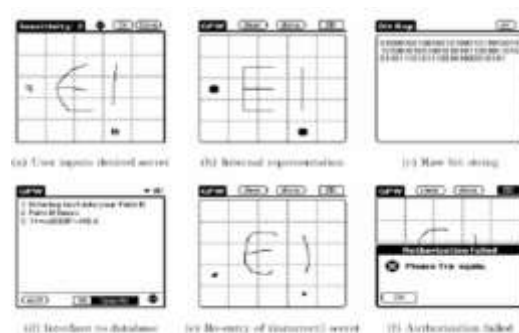

Fig 1 DAS

Review on Smart City Using Internet ofThings

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Abstract: **A smart city is not only a high tech place their people use high technologies. A smart city is actually called a smart city when it has a balanced amalgam of a technology, strong infrastructure and positively forwarded society. There are lots of challenges faced by urban mobility; and their elements influence the manner in which individuals move, for the most part however not just, inside urban communities and huge metropolitan areas. For example if a city has a number of high tech metros on the road but no cleanliness and time-tables then it cannot be a smart city. A city needs a lot of effort to be a smart city, without proper knowledge and education as a man cannot improve his life style and so as city as well. Smart City should have a society which can make it ways as solid as the building build on it but not only the infrastructure the society should be strong to understand the modern need of the city. There are a lot of challenges which our world is facing as technologies have both profit and losses. To build a smart city a dynamic balance of the profit and losses is required at most level. Before introducing any technology in our life style we should know the proper use of it else we will face to build a true smart place for us.**

Keywords: Urban mobility, high tech, amalgum, smart city, metropolitan area.

I.INTRODUCTION

In today scenario everybody is just running to build a smart city. What smart city actually means? A smart city is only a place with multi-storeys building, modern transportation, amenities or technology in every work of daily life??? No, smart city is a place which use technology for its development without hampering its social life and their life styles.
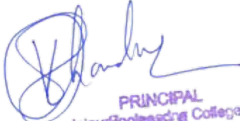
Internet of things is defined as a Complex "ecosystem" which is used to connect anything, any resource, business and subject using any network. It also describes a world in which everyday objects are connected to a network so that data can be shared. Internet of things is largely recognized as collection of interrelated things within the smart cities. Here we talked about the layer organize design and layered smart cities architecture in this paper. Here the Internet of things is centered around the particular applications and advances for layer in keen urban communities, for example, brilliant homes, transportation, waste and water the executives and so on.. Here we also discussed about the challenges that are faced by urban mobility such as environmental challenges, transportation challenges, societal challenges and governance challenges. Smart rail depends upon the smart technologies as the future of the railways.

II. VERSATILITY ON THE 21ST CENTURY: THE CHALLENGES

Presently days the urban versatility is confronting a societal, transportation, ecological and administration challenges, with the high effect on the urban communities way of life. In this section we provide the details about the challenges that are faced by cities.

A) Societal Challenge:

Huge urban communities individuals focus on work like centre points of transportation, business and governments. In 2016, urban zones populace was 54.5% while by 2013 it was suited by 60% of individuals which implies that in any event half of million

SEARCH ENGINE OPTIMIZATION TECHNIQUES AND IMPLEMENTATION

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Abstract : **Search Engine Optimization (SEO) is the way toward influencing the perceivability of a site or a website page in a web search tool's unpaid outcomes. It is the way toward getting traffic from the "free," "natural," "article" or "normal" list items on web indexes. Website improvement is a vital method to take a web record in top indexed lists of a web index. Online nearness of an association isn't just a simple method to reach among the objective clients however it might be productive as well if advancement is finished keeping taking into account the objective clients as of the explanation that more often than not clients search out with the watchwords of their utilization (Say; PhD in web innovation) instead of looking through the association name, and on the off chance that the page connect comes in the top positions, at that point the page ends up being gainful.**

Keywords : **SEO, Search Engine Optimization, PageRank, Search Algorithms, Search Engine**

I. INTRODUCTION

Internet has given all the organizations and associations a huge stage to sell and promote their items and administrations. However, effortlessly to outreach accessible to every last one of them the opposition has risen significantly more. There is no uncertainty an enormous crowd they would now be able to target however they are not by any means the only ones who can do as such. There are abundant sites that manage a similar item/administration which a specific association is managing. Indeed, even a very much displayed, organized and intuitive site may fall in the hands of expanding rivalry. In this day and age where every single significant business have gone on the web, if your site isn't recorded among the best scarcely any pages of list items, your business can endure significant misfortunes. Site improvement (SEO) is to the salvage. It empowers you to not just get recorded on Search Engine Results Page (SERP) yet in addition extend your business. Additionally considers have demonstrated that it can support the quantity of guests on your site by 400% and client transformations by 100%.

II. SEARCH ENGINE ALGORITHMS

[a] PageRank Algorithm

Page Rank is a calculation wherein a numerical weight is appoint to a website page as indicated by its relative significance. It utilizes approaching connection data to appoint worldwide significance score to all pages on the web. Number of approaching connections from quality locales gauges the notoriety of a page. It depends on amount and nature of both inbound and outbound connections. Pages which have higher position are generally significant and it has

Sign Language Recognition System

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Abstract - **One of the fastest-growing areas of research is sign language recognition. In this field, many innovative techniques have lately been created. Sign Language is mostly used by deaf and dumb people to communicate.The referred paper demonstrates the use of Python to recognise 26 hand gestures in Indian sign language. Pre-processing and hand segmentation, feature extraction, sign recognition, and sign to text are the four modules included in the proposed system. Image processing can be used to perform segmentation. Sign Language is the most natural and expressive way for hearing-impaired people to communicate. People who are not deaf never attempt to learn sign language in order to interact with deaf people. As a result, deaf people are isolated. However, if a computer can be programmed to translate sign language to text format, the gap between normal people and the deaf community can be narrowed.**

Index Terms – Tensor Flow, OpenCV, CNN(Inception).

I. INTRODUCTION

Every country has its own sign language, which varies greatly in grammatical structure. Indian Sign Language is the name given to the sign language that exists in India (ISL). It has been suggested that the same sign language is used in Nepal, Sri Lanka, Bangladesh, and Pakistan's border regions. Other sign languages are as follows:The American Sign Language (ASL), the British Sign Language (BSL), and others are examples of various sign languages. In general, the semantic meaning of the language components varies across sign languages, but there are some signs that have a universal syntax. For example, a simple gesture with one hand expressing "hi" or "goodbye" has the same meaning all over the world and in all sign languages.ISL is a complete natural language with its own morphology, phonology, syntax, and grammar that originated in India. ISL is a visual-spatial language that uses hand, arm, facial, and head/body movements to convey linguistic information. Both isolated and continuous indications are produced using ISL. An isolated sign is a precise hand configuration and attitude portrayed by a single image that concentrates on a single hand gesture. A continuous sign is a series of images that portray a moving gesture.

II. ISSUES WITH THE CURRENT ENTERPRISE

The user of the glove-based technique must wear a device that carries a bundle of cables in order to connect the gadget to a computer. The disadvantage of this approach is that the signer must wear both the sensor hardware and the glove while using the system. These technologies are costly and detract from the naturalness of sign language communication. Deficiencies in the current system:
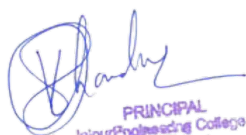● Use of wires leads to complications.
● Expensive
● Difficult to use
● Not portable

III. PROPOSED WORK

●Vision based system

Only a camera is required for the vision-based technique, which deals directly with picture motions. It's a two-part procedure: capturing a sign The application retrains an existing model using Transfer Learning to classify a new collection of photos.This software demonstrates how to train a new top layer for recognition of various image classes using an Inception v3 architecture model learned on ImageNet images. Any folder holding subfolders of images can be substituted for the image dir option. Each image's label is derived from the name of the subfolder in which it resides. There are millions of parameters in modern image recognition models.It takes a lot of labelled training data and a lot of computer resources to train them from begin (hundreds of GPU-hours or more). Transfer learning is a strategy for speeding up this process by reusing a chunk of a model that has already been trained on a related task in a new model. Though it isn't as excellent as training the whole model, it is remarkably effective for many applications, requires only moderate amounts of training data (thousands rather than millions of annotated images), and can be completed in under thirty minutes on a laptop without a GPU.

This tutorial will teach you how to run the sample script on your own photos, as well as discuss some of the options you have for controlling the training and sign analysis processes. Vision-based solutions provide the user with a more natural environment and eliminate the hassles that come with glove-based methods.

5G and its Enabled Technologies

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Abstract

The 5th generation (5G) of cellular and wi-fi communications networks pursuits at addressing a various set of use instances, services, and packages with a specific recognition on permitting new enterprise instances through community slicing. The improvement of 5G has for that reason superior speedy with studies tasks and standardization efforts ensuing with inside the 5G baseline structure. Nevertheless, for the conclusion of local end-to-end (E2E) community slicing, in addition functions and optimizations shall nonetheless be introduced. In this paper, we offer an opening evaluation of present day 5G system (5GS) with appreciate to a few precise improvements and element our insights at the permitting improvements that may fill the recognized gaps. We will then speak the critical constructing blocks and layout ideas of an developed 5G baseline structure capitalizing at the improvements which can be being developed.

Introduction

At the start of wi-fi cellular conversation, it begins off evolved with the voice conversation gadget only, i.e. the primary generation (1G). With the significant development in wi-fi conversation structures, there became a constant development with inside the wi-fi cellular conversation which in end result offer the second (2G),third (3G) and fourth-generation (4G) wi-fi networks respectively. Due to immoderate use of multimedia and net making use of packages together with the use of voice functions, a few new technology want to be brought via way of means of focusing increment in capacity, better facts rate, minimal latency and notable QoS. 5G

networks are the only which affords the above-cited functions which are notably required via way of means of destiny networks. Some of the important necessities of 5G structures are facts rate, latency, strength usage and cost. Utilization of strength is constantly a challenging factor of designing and operation of all wi-fi conversation structures and the equal is going for 5G networks.

How does 5G works?

Verizon is provisioning its 5G Ultra Wideband community with numerous additives, such as fiber-optic cable, small cells and sizable radio wave spectrum holdings. A crucial aspect of Verizon's spectrum holdings is known as millimeter wave spectrum, which refers to excessive frequency bands—specifically, the ones with inside the 28 GHz to 38 GHz range. It is in those spectrum bands that tomorrow's maximum audacious, latency-touchy and bandwidth-in depth improvements will rely. Think of millimeter wave spectrum because the widest, quickest dual carriageway at the planet, with hundreds of thousands of vehicles journeying centimeters other than each other at incredible build out are small cells and the fiber-optic cable. Small cells are transmitters, more or less the scale of a computer computer, which might be strategically located in places wherein utilization needs are highest—consisting of downtown areas, purchasing centers, sports activities venues, and university campuses.

Fiber-optic cables incorporate dozens to loads of optical fibers inside a unmarried casing, shifting records alerts from the

DATA SCIENCE: AN APPROACH TO LEARN THINGS

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Abstract - In our daily lives, a great amount of data is being generated. About 2.5 quintillion of data is generated by our world daily. This data is mainly based on some specific uses and generated by various people. The data generated is somehow broken which means that, it is either in form of structured data or some kind of data is unstructured. For our uses, we need to extract some sort data from that structured or unstructured data and this extraction is done by data mining which is a part of data science. Data science is a vast field and can be elaborated in many ways. Data science is not only about Data analysis and Data Mining. Data science includes Machine Learning, Deep Learning, Big Data, Analytics, and Data Modeling, Data integration, Mining and artificial Intelligence. Data Science starts from processing of Data to Extracting of data and visualizes it according to the needs. Data Science is totally a mix up of several components of Data. Why is it called Data Science? The answer behind it is simply defined from the word science only. It means that science behind all the data comes under Data science. Playing and arranging the data according to needs is the basics of Data Science. There are several systems for Data Science. There is no standard benchmark for evaluating or comparing these data systems for doing data science.

Keywords - Data, Mining, Extraction, Analysis;

[1] INTRODUCTON

Data science is the study of general extraction of knowledge from various kinds of data whether a structured data or unstructured data.

A common epistemic requirement in assessing whether new knowledge is actionable for decision making is its predictive power, not just its ability to explain the past. A data scientist is required with all of his ability to deploy the things. A data scientist requires an integrated skill set spanning mathematics, machine learning, artificial

intelligence, statistics, databases, and optimization, along with a deep understanding of the craft of problem formulation to engineer effective solutions. The world is driven by research and development at different levels and especially with advanced digital technologies. The term data science is somehow a huge part of the new technologies. The term "science" implies knowledge gained through systematic study. In one definition, it is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions. Data science is different from statistics and other existing disciplines in several important ways. To start the raw material the "data" part of Data Science is increasingly heterogeneous and unstructured - text, images, and video - often emanating from networks with complex relationships between their entities.
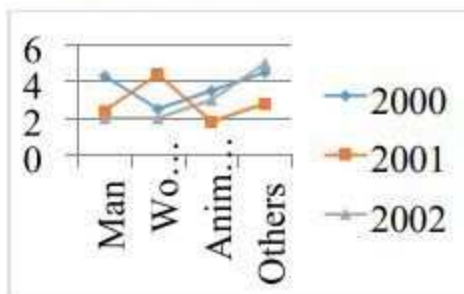

Fig 1. A Data Graph

[2] DATA SCIENCE

The field encompasses analysis, preparing data for analysis, and presenting findings to inform high-level decisions in an organization. As such, it incorporates skills from computer science, mathematics, statistics, information visualization, graphic design, and business. Data Science consists of several things like Machine Learning, deep learning, artificial intelligence, Big Data, Data Mining, and Data Analytics. To describe what is data science is difficult as there are several fields

Event Log Management and Monitoring

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Abstract—Servers and other network devices are used widely leading to generation of huge amount of data per second. Hence the need for gathering, analyzing, managing and monitoring this data is crucial. This paper casts light upon the need of event logging in various areas of activity such as social media, cloud computing, software and hardware security, goods and service procurement etc. The proposed paper deals with different ways of collecting, examining and using the data to maintain security, protect the credentials and monitor the sequence of events. In networking, SIEM or Security Information and event management software play a vital role in providing enterprise level security by capturing, analysing and reporting activities. In SIEM, certain acts have been enforced to look whether the monitoring, recording and reporting of data meets the compliance or not. Multiple acts such as PCI DSS, HIPAA and FISMA have been enforced. These log activities can also be used by organizations to measure the customer behaviour. However, SIEM is mostly implemented by enterprise-level organizations capable of achieving continuous improvement. The maturity model shows how capable an organization is by judging how good it is at self-improvement.

Keywords- Event logging, security, events, logging, log management, siem, social media, cloud, goods, procurement, acts, tools, log security, HIPPA, FISMA and PCIDSS.

Introduction

In our workplace, we hear of various security breaches within an organization where hackers acquire access to the credentials, security and financial information. They gather information with the help of logs generated through devices. In our day in day out life, we use several devices and resources such as operating systems, servers, internet, firewalls, proxy networks, websites, social media, routers, etc. These resources generate a huge amount of data per second which contains information about the user, system, and device. The data collected from the resources is called an event log. The event logs are the data that provide information about the user, activities performed and about the system. Such data plays a vital role for security purposes and to track for unauthorized access, malicious activities on the system or network. The SANS 2012 Log Management Survey discovered that 82% of the contributing organizations contemplate logs critical for tracing suspicious actions, and almost 60% use agents, Syslog and native OS tools to pleat logs within a log management manifesto.

Event logs contain crucial information which can be used precisely if they are properly managed and collected. Thus the log management consists of several steps to generate figures about malicious activities, security breaches, and unauthorized access.

The phases of event management also known as maturity curve consist of:

1. Log ignorance: logs are not composed and studied.
2. Log collection: logs are drawn together but not analyzed thus the process of collection of disparate log files and integrate them for analysis is called log aggregation. The method of data collection varies with different domains.
3. Log investigation: logs are observed only if any incident occurs.
4. Log reporting: logs are collected and assessed monthly.
5. Log review: logs are evaluated and reviewed on regular basis i.e., delayed monitoring is performed.
6. Log monitoring: real-time monitoring of information gained from log management. [9]
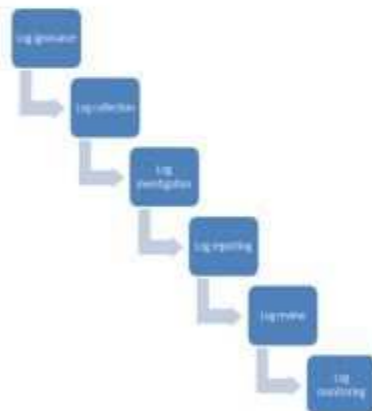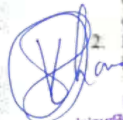

Fig 1 Maturity Curve

SIEM (Security Information and Event Management)

It is the network-based software that is used widely in IT industries to manage logs. It consists of SEM (Security Event Management) which carries out event and log analysis to perform threat monitoring and event correlation and SIM (Security Information Management) which retrieves and analyzes data to create a report.

Its major principle is:

1. Multiple sources are identified and integration of data is done to identify deviation from the normal activity and take counter measure.
2. Employ rule-based logging [3] to define the relationship between log entries.

APPLICATIONS OF NANOTECHNOLOGY IN ELECTRONICS AND COMMUNICATIONS

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Abstract - **In this paper we can see developments in electronics and communication engineering by providing advantages of implementing the nanotechnology in these areas. This paper presents an insight into some of recent breakthroughs in nanotechnology which incorporates different devices like nano transistors, paper battery, nano robotics, nano sensors, wireless innovation, nano communication and networks. Nanotechnology is therefore expected to enable the production of smaller, cheaper and powerful devices with increasing efficiency.**

Keywords: Nanotechnology, transistors, nano robotics communications, nano sensors, wireless technology.

[I] INTRODUCTION

Nanotechnology is the study of phenomena and finetuning of materials at atomic, molecular and macromolecular scales, where properties differ s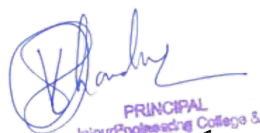ignificantly from those at a larger scale. Nanotechnology is also defined as the study of structures which are in size between 1 to 100 nm.

Nanotechnology is changing significantly in the field of electronics, especially in regard to computers, telecommunications and optics [1], [2], [3], [6]. In some sense, electronic miniaturization has been the true driving force for nanotechnology research and applications. The main aim in this area is to understand nano scale rules and mechanism in order to implement new ICT (Information and communication technology) systems more economic, little and reliable. Nanotechnology has application in drug delivery, i.e. most harmful side effects of treatment such as chemotherapy are a result of drug delivery methods which do not pin point their intended target cells accurately. Nanoparticles of iron can be effective in the cleanup of chemicals in groundwater because they react more efficiently to those chemicals than larger iron particles. Nano sized particles of carbon like nanotubes and Bucky balls are composed of only carbon and they are very strong. A T-shirt weight bullet proof vests made out of carbon nanotubes is the best example that shows how much strong will be the Nano sized particles of carbon. This is because their strength comes from special characteristics of the bonds between carbon atoms. Nano-sized particles of titanium dioxide and zinc oxide are used in many sunscreens to block UV radiation more effectively.

Nanotechnology may offer new ways of working for electronics. Nanotechnology science is developing new circuit materials, new processors, new means of storing information and new manners of transferring information. Nanotechnology improve the capabilities of electronic components like by reducing the size of transistors used in integrated circuits, researchers are developing a type of memory chip with projected density of one tera byte of memory per square inch and this increases the density of memory chips. By improving display screens on electronics devices and this reduces power Consumption and also the weight and thickness of the screens.

In communication system based on nanotechnology is discovering new materials on the nanometer length scale expected to play an important role in future challenges in the field of communication systems such in devices of ultra-high-speed for long- and shortrange communications links, power efficient computing devices, high density memory and logics, and ultra-fast interconnects [5]. Also the use of

MODELING ERROR

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Abstract— Overfitting is a modeling error that occurs when a function is too closely fit to a limited set of data points. Overfitting the model generally takes the form of making an overly complex model to explain idiosyncrasies in the data under study.

In reality, the data often studied has some degree of error or random noise within it. Thus, attempting to make the model conform too closely to slightly inaccurate data can infect the model with substantial errors and reduce its predictive power.

Keywords— Overfitting, Machine Learning, Modeling Error, Data Science, Neural Network.

Ⅰ. INTRODUCTION

In supervised machine learning, there's an un-detouring issue. Model does not generalize well from observed data to unseen data, which is called overfitting. Because of the existence of overfitting, the model performs perfectly on the training set, while fitting poorly on the testing set. This is due to that over-fitted model has difficulty coping with pieces of the information in the testing set, which may be different from those in the training set. On the other hand, over-fitted models tend to memorize all the data, including unavoidable noise on the training set, instead of learning the discipline hidden behind the data. The causes of this phenomenon might be complicated. Generally, we can categorize them into three kinds: 1) noise learning on the training set: when the training set is too small in size, or has less representative data or too many noises. This situation makes the noises have great chances to be learned, and later act as a basis of predictions. So, a well-functioning algorithm should be able to distinguish representative data from noises; 2) hypothesis complexity: the trade-off in complexity, a key concept in statistics and machining learning, is a compromise between Variance and Bias. It refers to a balance between accuracy and consistency. When the algorithms have too many hypotheses (too many inputs), the model becomes more accurate on average with lower consistency. This situation means that the models can be drastically different on different datasets; and 3) multiple comparisons procedures which are ubiquitous in induction algorithms, as well as in other Artificial Intelligence (AI) algorithms. During these processes, we always compare multiple items based on scores from an evaluation function and select the item with the maximum score. However, this process will probably choose some items which will not improve, or even reduce classification accuracy.

II. METHODOLOGY

2.1 Detection

A key challenge with overfitting, and with machine learning in general, is that we can't know how well our model will perform on new data until we actually test it. To address this, we can split our initial dataset into separate training and test subsets. This method can approximate how well our model will perform on new data. If our model does much better on the training set than on the test set, then we're likely overfitting. For example, it would be a big red flag if our model saw 99% accuracy on the training set but only 55% accuracy on the test set. If you'd like to see how this works in Python, we have a full tutorial for machine learning using Scikit-Learn. Another tip is to start with a very simple model to serve as a benchmark**.** Then, as you try more complex algorithms, you'll have a reference point to see if the additional complexity is worth it. This is the Occam's razor test. If two models have comparable performance, then you should usually pick the simpler one.

2.2 Prevention

Detecting overfitting is useful, but it doesn't solve the problem. Fortunately, you have several options to try. Here are a few of the most popular solutions for overfitting: Cross-validation: Cross-validation is a powerful preventative measure against overfitting. The idea is clever: Use your initial training data to generate multiple mini train-test splits. Use these splits to tune your model. In standard k-fold cross-validation, we partition the data into k subsets, called folds. Then, we iteratively train the algorithm on k-1 folds while using the remaining fold as the test set (called the "holdout fold"). Cross-validation allows you to tune hyperparameters with only your original training set. This allows you to keep your test set as a truly unseen dataset for selecting your final model.

Early stopping when you're training a learning algorithm iteratively, you can measure how well each iteration of the model performs. Up until a certain number of iterations, new iterations improve the model. After that

CLOUD CRYPTOGRAPHY

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Abstract:
Cloud computing is an Internet-based processing model that gives a few assets through Cloud Service Providers (CSP) to Cloud Users (CU) on interest premise without purchasing the fundamental foundation and follows a pay-per-use premise. A client will pay the sum as indicated by the measure of the extra room utilized. Cloud computing offers support to the client through a webassociation. It underpins the virtualization of actual assets to improve productivity and the achievement of numerous errands simultaneously. The fundamental explanation behind utilizing the cloud is that the client canstore and access the put-away information in the cloud from anyplace whenever. The cloud client need not stress over the upkeep of programming, equipment, and storage. The principle explanation behind utilizing the cloud is that the client can store and access the put-away information in the cloud from anyplace whenever. The cloud client need not stress over the support of programming, equipment and extra room. The fundamental preferred position of distributed computing is every one of these administrations are given with ease to the client. Therefore, all clients move their information on the cloud.

The significant issue in distributed computingis security in light of the fact that the data put away in the cloud isn't straightforwardly kept up by the client. Security is by all accounts an interesting worry in the cloud. While sending the information through the web any unapproved client can alter the information or access it. Various kinds of administration models under distributed computing encourage different degrees of security administrations. We will get the base security in IaaS (Infrastructure as a Service) and most with a SaaS supplier. In this paper, we will center after looking into and understanding cloud security issues by proposing crypto calculations and powerful measures in order to guarantee information security in the cloud. Alongside this, we will explain a touch more about some security parts of cryptography by exhibiting some protection issues of current distributed computing environmental factors.
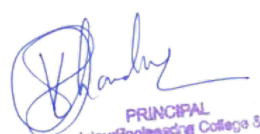
Keywords: Cloud Computing, Cryptography, Cryptography techniques, Service models, Deployment Models, Steganography

I. Introduction

Cloud Computing is the moving innovation that utilizes the organization to offer support to the client. Cloud goes about as a virtualized programming. The large-scale and small-scale organizations are going through a lot of cash to store and keep up their information.

Distributed computing offers assistance to the finance managers by putting away, calculating, and keeping up the information effortlessly.

Distributed computing permits the business client or individual client to utilize the application through the web without introducing in their framework. For instance: Gmail, Facebook, YouTube, dropbox. The client will pay the sum according to information utilization. The principle bit of leeway of distributed computing is ease, expanded capacity, and adaptability. The significant danger in distributed computing is security and

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AR & VR: Challenges and Future Scope

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Abstract

Nowadays, with the development of highly competitive and low cost hardware, computers are already take their places as a part of our everyday life. High performance mechanism and electronics is now offer great and continuously improving resources ready to reinforce us in the implementation of ordinary tasks. A way to utilize these new resources is given by Augmented Reality (AR).Augmented Reality mixes virtual and actual reality, making available to the user new tools to ensure efficiency in the transfer of knowledge for featured processes and in several environments. It is providing many useful features that is attracting greater attention from the researchers ,students and professionals. Several solutions based on Augmented Reality have been proposed by the research community: specially in maintenance functioning Augmented Reality tools have proposed new perspectives and have promised dramatic implementation .VR & AR proved their importance, when planning, education, marketing, tourist sport preservation coming to light. Application of Virtual Reality (VR) system has been proven to be reasonable and effective in proposing the importance and engagement for users to working with the virtual environment (VE). An attempt to specify the issues from presented studies by the researchers within the time of papers between in last 14 years. There is no big changes implemented in this reviewing process but the aim is to connect the user experience and application system through concern and learning from the challenges in the system itself. This paper also contains the future research directions and predicts the development trends and scope of AR and VR system.

Keywords: Augmented Reality, Virtual Reality, Virtual Environment;
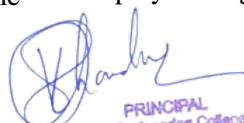
Introduction

Augmented Reality (AR) is a new technology that contains the overlay of computer graphics and interactive experience of the real world . One of the best overviews of the technology, that defined the field, described the problems, and summarized the improvements. Augmented reality basically works on reality and physical subjects to activated computer-generated environment over the top of reality, in real time. Essentially, Augmented Reality is a technology that build computer-generated pictures or images over a user's view of the real time world. These images are typically converted & build in shape as 3D models & videos.

A system application that is delivered through 3-dimension computer imageries in simulated environment and provides possibilities for users to explore and experience immersive by utilizing unique designed electronic technologies for visualization and/or to perform interactions in real time within the built VE or virtual world is called VR. The Augmented Reality had came before just over one decade, but the growth and progress in this field in past few years has been remarkable.

Virtual Reality environment system in this case is the generation of an environment which filled with rich interactivity for users to explore and interact freely with an entire computer generated environment. Furthermore, so as to attain great level of engagement and sense of presence when experiencing the appliance system, understanding and learning about the problems within the context can bridge the challenges gap. Consider understanding the users in design and development phase instead of heavily focusing only on the practice or inventions features.

The issues and challenges can acquire from both hardware and software implementation within the Virtual Reality application system. As for visualization in VR system, there are many ways of installation and setups presented to achieve the stereoscopic view depending on the 3D imageries output platform such as head-mounted display (HMD), desktop screen, smart phone, wall projection and other more. In enhancing the immersion of exploration, the method in navigation system also plays a significant role to guide users on how to

A Review On Holography In Fingerprint Authentication

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Abstract — In this period of exceptionally progressed computerized picture handling, it is extremely hard to store biometric subtleties like finger impression of a profoundly needed criminal in a safe way. Any carefully put away information can be manufactured, or the put away information can be effortlessly obliterated or controlled. Consequently, a protected stockpiling and handily recuperated strategy should be applied in such fields. Computerized holographic information stockpiling is perhaps the most secure stockpiling techniques accessible that can be utilized to determine this issue. It gives a tenable route in the finger impression procurement in the criminal examination field. The precise stage remaking is the extraordinary preferred position of advanced holography contrasted and conventional unique finger impression securing strategies. Also, computerized holography has numerous critical preferences, for example, basic, high precision and high goal, besides, it is a non-ruinous strategy, doesn't subvert the on location fingerprints. Additionally, some advanced picture preparing can be applied to the first visualization and the recreated picture, for example, the picture contrast lighting up, separating, etc. Subsequently, it is conceivable to acquire an advanced visualization with higher caliber. Subsequently, advanced holography can be utilized for secure capacity and examination of fingerprints in the criminal examination field.

Keywords :- Fingerprints, analysis, visualization and bifurcation.

I. INTRODUCTION

Fingerprints are the most precise and ordinarily utilized biometric strategy for individual distinguishing proof. Since 1880s fingerprints were utilized as biometric procedures for human distinguishing proof in the criminal examination field[1]. It is the invariant property and uniqueness of finger impression which makes it an individual identifier. The primary issue emerges with regards to the protected stockpiling of peer fingerprints. By ordinary strategies dormant fingerprints can't be gathered without staining the surface with the unique mark. Likewise with the extremely progressed procedures in computerized picture handling, any picture put away carefully can be controlled or annihilated. It involves concern with regards to the fingerprints of exceptionally needed hoodlums. Such
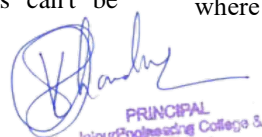
$$E_0(x,y) = a_0(x,y)exp(i\phi_0(x,y)) \qquad (1)$$

fingerprints put away carefully can be handily controlled by basically affecting an official in the legal division. Likewise if a noxious assailant accesses the gadget, the aggressor additionally accesses the biometric. Numerous procedures were utilized for expanding the security of put away fingerprints. Distinct C Draper proposed a technique utilizing Selpian Wolf codes which portrayed a strategy to encode unique mark biometrics safely for storage.They introduced a model for a protected biometric framework. In any case, there was a compromise between the security of the framework and the vigor of authentication[2]. Davida,Frankel, and Matt considered the utilization of mistake revision coding as an answer for this problem[3]. Juels and Sudan presented the possibility of a fluffy vault to formalize the utilization of mistake revision codes for such applications[4].Several specialists have investigated crypotographic parts of the issue in more profundity. Altogether these techniques the fingerprints must be encoded first. However, even in the wake of encoding, they are put away in an advanced way, which again can be fashioned.

II. THEORETICAL   ANALYSIS

A.   Recording Of Digital Hologram

The 3D image age is an obstruction cycle, and visualizations are normally recorded with a laser light source. The wave containing the data of the item is known as the article wave, and the other meddling wave is the reference wave. For straight forwardness, the reference wave is now and then taken to be a uniform plane wave. When all is said in done, the item wave at the account plane can be depicted as where a0 is the sufficiency and φ0 is the period of the

Smart Voting System Through Facial Recognition

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Abstract— Voting system plays a critical role in democratic countries. Vote means to choose a good candidate who is contesting an election. The current voting system is not secure and time consuming as well. The voters need to go to distributed places like polling booths and stand in a very long queues to cast their vote, due to these reasons most of the people misses the chance of casting their votes. The people who are not eligible for voting, they also cast their votes which can cause various problems. There are many loopholes in the current scenario of voting. There is always been question on the working of Electronic Voting Machine (EVM), so we need to take care of that aspect also. Considering all the drawbacks of existing voting system and to make it more secure, we come up with an idea of using face detection technique in voting system. Here we have three steps in voting process. The first step would be the unique id number (UID) verification, second step would be the election id number (EID) verification and third step would be face recognition. This proposed Voting System could offer higher security than the existing one and could increase the vote percentage.

Keywords— Electronic Voting Machine(EVM), Unique Id Number(UID), Election Id Number(EID).

I. INTRODUCTION

There are two types of method followed in India for voting. The first method is used to vote through ballot paper, in which many papers are used and second method is EVM (electronic voting machine). We need to make existing system more secure or adapt new technologies to make it more secure. In this paper, our main focus is to make the voting system more secure by using face recognition technique. We used face recognition concept to identify the exact person whose image is stored in the database. Three levels of verification were used for the voters in our proposed system. The first one is to verify Unique id number, second level is to verify election commission id or voter card number, if that number is correct then only you could go for the third step which is face detection method. If the image taken matches with the respective image of the voter in the database, then a voter can cast their vote in the election as in this current scenario the voting process is not too secure.

II. EXISTING TECHNIQUES

In the current voting system, the ballet machines were used which displays various parties symbols. When we press the button of any respective party's symbol, then only it is said that is voting is done. The chances of casting a vote by any unwanted or unethical way is more in current system. Many people could easily cast the vote by any other person's name without being caught or they could easily capture the booth and cast numerous numbers of votes. This is completely unacceptable in huge democratic country like India. In the existing system, the person has to travel long places to his constituency to cast his vote.

Fig.1 Existing Voting Process Scenario

So we need a system that is far more effective and more secure than the existing one and which could cover all the loopholes present in the existing system. Thus, we are proposing a system which is more secure and better that the existing one, which uses face recognition technique. A facial authentication process is used for detecting the right person which will help the voters to cast their vote from their place itself.

III. LITERATURE SURVEY

Talking about the related work, there is pretty much research is already done on these topics, these are:

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Transforming healthcare throughInternet of Things

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Abstract

In the current era, there is a requirement of a system with connected devices, persons, time, places and networks, which is completely incorporated in what is called as Internet of Things (IoT). Internet of Things has become the ultimate building blocks in the development of healthcare monitoring system. The aim of an efficient IoT healthcare system is to provide real time remote monitoring of patient health condition, to prevent the critical patient conditions and to improve the quality of life through smart IoT surroundings. New challenges have been introduced with IoT for the security of systems and processes and also with the privacy issues of person's medical data. Information security using IoT is very complicated and difficult; since global connectivity and accessibility is the major concerns related to IoT. Security and privacy by design need to be part of any IoT use case, project or deployment. A number of papers have worked on the access control mechanism with different techniques and with energy efficiency. Few papers have proposed different types of protocols for authentication. A system is required for the fusion of authentication protocol with energy efficient access control mechanism along with the solutions to countermeasure the other attacks in security and privacy of patient healthcare data. After going through the methodology for authentication protocol, for access control and for energy efficient access control mechanism, a combined methodology is proposed to be adopted to pool the gap.

1. Introduction

Traditional methods of providing security cannot be directly implemented in IoT's because of different standards and communication stacks involved. Information and Communication Technologies (ICTs) deployed as part of medical information systems must assure various significant security necessities together with integrity, confidentiality, availability, non-repudiation, authentication, authorization, and accountability so as to secure medical information without affecting the efficiency of services and privacy of patients' data.

Why IoT for healthcare? The major problem that every patient, particularly living in remote locations found was unavailability of doctors and treatment on critical conditions. This had very dreadful consequences on people's mind about the hospitals and doctors services. Nowadays with the implementations of new technologies by making use of IoT devices for

healthcare monitoring system, these issues have been sorted to huge extent. IoT has the potential to not only keep patients safe and healthy, but to improve how physicians deliver care as well. Healthcare IoT can also boost patient engagement and satisfaction by allowing patients to spend more time interacting with their doctors. The usage of the Internet of Things (IoT) in healthcare is a vast ecosystem. Within the overall connected healthcare and eHealth picture, more integrated approaches and benefits are sought with a role for the so-called Internet of Healthcare Things (IoHT) or Internet of Medical Things (IoMT).

2. A brief review of the work already done in the field

Definition of IoT:

Kevin Ashton firstly proposed the concept of IoT in 1999, and he referred the IoT as uniquely identifiable interoperable connected objects with radio-frequency identification (RFID) technology (Shancang, 2015). Luigi et al. in their paper addresses the Internet of Things. Main enabling factor of this promising paradigm is the integration of several technologies and communications solutions. Identification and tracking technologies, wired and wireless sensor and actuator networks, enhanced communication protocols (shared with the Next Generation Internet), and distributed intelligence for smart objects are just the most relevant (Atzori, 2010). The basics of IoT as the combination of internet and the emerging technologies has been discussed (Korteum, 2010).

Shen has studied that the e-Healthcare system mainly consists of three domains: body area, communication and networking, and service. The bodyarea domain is defined by a number of wireless body area networks (WBANs), each corresponding to a user. The major functionality of the communication and networking domain is to bridge the body area and service domains. Advanced wireless communications technologies (e.g., cellular networks, WiFi, and WiMAX) link WBAN gateways to the Internet and enable efficient mutual data communication between two WBANs. In the service domain, a trusted authority maintains an online server that is responsible for receiving, recording, and analyzing user health-related information. (Shen X., 2012).

The architecture of IoT framework and the issues in design of IoT hardware and software components (Gordana, 2017) have been discussed. They have elaborated the various application areas of IoT, such as

Scaling Decentralized Finance

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Abstract - DeFi is a financial system built around Cryptocurrencies, especially existing on the Ethereum blockchain, people lend in their stable tokens(cryptocurrencies) and earn interest on them, there are swaps and financial services as well. All this happens with the least human intervention, and everything is controlled by protocols, it currently suffers from two major problems, very high transaction costs and traffic too high on Ethereum. Other cross-chain solutions have way too little footfall to make the whole thing sustainable/ profitable.

This problem can only be solved when we go cross-chain while ensuring high APR to attract more footfall and not trigger a chicken and egg situation. The proposed solution is to use cross-chain solutions like Polkadot to transfer assets to substrate-based Polkadot chain and then perform all the DeFi operations there. to ensure good APR stake the locked tokens in the mining process to overcome the chicken and egg situation. Higher APR can be sought by connecting to more Proof of Stake based chains where stake can be delegated and a smart contract can decide which chain is giving higher APR and then stake the tokens, a decentralized swap will be required to exchange one token for another and then staking them.

Index Terms - Decentralized finance, scalability, blockchain interoperability, cryptocurrency swaps, cryptocurrency staking.
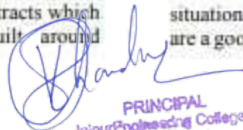
I. INTRODUCTION

Satoshi Nakamoto brought forth the best use case of blockchain with the introduction of bitcoin. But it was limited to only transacting bitcoins from one address to another, little to no services could be built around it, especially the decentralized ones. Vitalik Buterin, inspired by bitcoin, came forward with Ethereum that supported smart contracts which laid the foundation for services to be built around

cryptocurrencies, especially ETH. This wasn't enough to trigger the DeFi race. DeFi started when MakerDAO introduced DAI, the first cryptocurrency-backed stable coin. It helped people with the biggest thing in the cryptocurrency world, Fear of missing out. People could now lock in their Eth and get DAI, if prices were to fall they could buy more ETH from stable coin DAI. If prices were to rise they could take their ETH back and sell it thus it created a win-win situation. After this DeFi never looked back, it has $16 Billion locked in protocols. Countless services are being built on top of DeFi. Most of the banks and investment banking groups are looking towards Ethereum and DeFi as a good investment.

II. SCALABILITY ISSUES IN DE-FI

Decentralized finance is revolutionizing finance sector but it is at the same time gripling with a lot of issues, mainly because of limited throughput of the underlying platform, Ethereum, as innovative as Ethereum is it still suffers from slow speed and there are a lot of users in Ethereum.

- DeFi has increased transactions so much on Ethereum that it leads to price wars for getting the transaction in, thus it causes exponentially hiked gas prices. For a simple approval call sometimes it takes about $25 which is not an appropriate fee. Hiked gas prices lead to spending more money in transactions than that being earned from DeFi protocols.
- DeFi has increased transactions so much that now 15 transactions per second of Ethereum is way too slow to handle the huge traffic, thus it leads to transactions being pending for hours and days, it has an extremely adverse effect on the transactions that involve using current prices because by the time that transaction gets through prices would have changed for better or worse.
- Going cross-chain or to layer 2 to solve all the problems has a different problem, that is the chicken and egg situation: protocols will not give better APR until there are a good amount of users and good amount of users will

Software Defined Networking andits Challenges

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Abstract- Trends (e.g., versatile, social, cloud, and huge information) in information and communication technologies (ICT) are instructing new difficulties to future Internet, that pervasive openness, high transfer speed, and dynamic administration are crucial. However, old methodologies upheld manual configuration of exclusive gadgets are awkward and blunder inclined, and that they can't completely use the capability of actual network infrastructure. As of late, Software Defined Networking (SDN) has been promoted together of the most promising answers for future Internet. SDN is described by its two recognized highlights, including decoupling the control plane from the information plane and giving programmability to arrange application advancement. Therefore, SDN is expected to supply more proficient setup, better execution, and better adaptability to oblige imaginative organization plans.

Software defined networking offers a few advantages for networking by isolating the control plane from the Data plane. Nonetheless, networks' versatility, dependability, and accessibility stay as a colossal issue.

SDN (Software Defined Networking) is a technique that plans to improve the control of network and flexibility. It is mainly associated with open flow network and ODIN V2 for remote communication. Its architecture is central, agile and programmatically configured. We talk about security features that upholds the insurance of GUI by requiring validation, SSL/TLS combination and logging/security audit services. The job based approval Fort NOX and ciphers like AES and DES will be utilized for encryption of information and improving the safety of SDN environment. These methods are valuable for upgrading the security structure of the controller.

I. Introduction

In the SDN architecture, the control and data planes are decoupled, network insight and state are logically centralized and consequently the fundamental network infrastructure is abstracted from the appliance. SDN centers around detachment of the control plane from the data plane, centralized controller and perspective on the network, open interfaces between the gadgets in the control plane (controllers) and those in the data plane and programmability of the organization by outside applications [4].

Traditional networks are intricate and hard to oversee. They include distinctive hardware that run complex distributed control software that is shut and exclusive. Traditional IP networks are upward coordinated, that is, they need the control and data plane packaged together. The objective of Software Defined Networks, SDN is to frame networks more programmable. The programmability of the network is accomplished through programming applications which run on top the network working framework (NOS) [4].

SDN isolates the control and data plane and it advances logical centralization of network control and acquaints the ability to program the network. SDN likewise makes it simpler to make and present new abstractions in networking, improving network management and facilitating network evolution. Also, SDN breaks vertical mix by isolating the 2 planes; The control plane – which chooses the best

Implementation of IoT for Smart Cities

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Abstract

The Internet of Things (IoT) is a cutting-edge technology that allows a variety of digital devices with various sensing, actuation, and processing capabilities to connect to the Internet, resulting in a multitude of new services in the context of a smart city. Smart city efforts are being enabled all around the world thanks to enticing IoT technologies and big data analytics. These services are increasing the quality of life in cities by upgrading infrastructure and transportation systems, reducing traffic congestion, and providing waste management. We create a taxonomy in this article to best present a generalised overview of the IoT paradigm for smart cities, integrated ICT, network kinds, potential prospects, and significant requirements. In addition, an overview of current standard-setting activities is provided.

Keywords: Appealing IoT services, Internet of Things, Smart City, Traffic Congestion, ICT, Standard Bodies, Open Source.
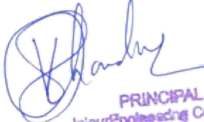
I. Introduction

The Internet of Things (IoT) is a ground-breaking communication paradigm that attempts to create a transparent and innovative framework for connecting a wide range of digital items to the Internet. As a

result, it aspires to make the Internet more immersive and all-encompassing. The growing Internet of Things sector is gaining traction as operators, sellers, manufacturers, and businesses grasp the opportunities it presents. According to the most recent IDC forecast1, the global IoT market will be worth 1.7 trillion dollars in 2020, up from 655.8 billion dollars in 2014, with a compound annual growth rate of 16.9%. In 2020, the devices alone are estimated to account for 31.8 percent of the overall global IoT market.. This greater percentage of the revenue in 2020 is expected by building IoT platforms, application software, and service-related offerings. A smart city is a complex ecosystem

characterized by the intensive use of ICT, aiming at making the cities more attractive, more sustainable and a unique place for innovation and entrepreneurship.

The smart city cycle also includes a variety of ICT technologies, development platforms, maintenance and sustainability, citizen-centric apps, and technical, social, and economic key performance indicators (KPIs). As a result, Internet of Things technologies will be critical in the deployment of large-scale heterogeneous infrastructures. Network type, scalability, coverage, adaptability, heterogeneity, repeatability, and end-user involvements are all factors to consider while developing IoT-based smart city applications. These applications can be divided into four categories: personal and home, utilities, mobile, and enterprises. Personal and household applications, for example, include the ubiquitous healthcare services to live independently via Body Area BANs are networks that allow a doctor to remotely monitor patients. Smart grid, smart metering/monitoring, water network monitoring, and video-based surveillance are examples of utilities applications. Intelligent transportation systems (ITS) and logistics, traffic management, congestion control, and waste management are all examples of mobile applications. A network of devices inside a work place is also common in IoT-based enter-prize applications. To connect IoT with smart city environments, several research initiatives have been performed. Zanella, for example, gave a thorough overview of the architectures, protocols, and enabling technologies for a web-servicesbased IoT framework.in the Padova smart city project. The proof of concept implementation with numerous technical solutions aim to monitor street lighting, the quality of air and identification of most critical issues. A survey on the fundamental IoT elements in realizing smart cities was conducted in which also described a case study on noise monitoring. Nathalie proposed a different perspective of smart cities in which IoT devices were considered service providers mimicking cloud based services. By removing the barriers between physical IoT devices and logical (cloud service providers) worlds, the concept provided

A Study on Privacy and Security in Internet of Things Devices

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Abstract- In the new era of Internet of Things (IoT) , where smart devices are enabled with sensors that collect information from its surrounding environment, process it and transfer it for further analysis. Companies usually don't give importance to security measures before connecting these devices to the internet. Possibility arises that someday connected devices might be used to harm the users. This might prove to be hazardous for medical industries as it might take the lives of patients. The potential risk of medical devices has put pressure on FDA to issue guidelines that should be followed while manufacturing wearable and healthcare devices. A wide range of data can be gathered that can vary from simple heart rate, blood pressure, habits to communication, location,24 X 7 monitoring through webcams. Using cheap sensors, IoT empowers a variety of devices and objects around us to look, feel and find. While IoT brings endless benefits, it poses a number of challenges, especially security and privacy. IoT security, ethics, ethical constraints and challenges have been discussed.

1. INTRODUCTION

The Internet of Things (IoT) is a collection of interconnected smart physical devices. These devices are embedded with software, hardware, and internet that enable them to gather and share data. IoT can be remotely controlled across all existing network infrastructure, this creates the opportunity for greater integration of devices into computer-based systems leading to improved performance, and accuracy. This in turn provides economic benefits for those who use it.

In the last few decades, the number of Internet of Things (IoT) devices has increased drastically . With total of close to 26 billion, a surprising conclusion is reached that there are at least two interactions per

person living [1]. The trend is expected to continue, with an estimated 50 billion connected devices by 2025, most of them IoT and portable devices [2]. Similar to embedded systems, IoT and portable devices are equipped with multiple sensors while also providing ways to establish network connectivity, allowing data transfer to a remote location.

To better understand security and privacy issues associated with the current IoT device design flow and results, we used Google Nest Learning Thermostat and Nike + Fuelband SE Fitness Tracker, after this called Nest Thermostat and Nike + Fuelband, as test devices. Our selection of these units was based on the fact that both Nest Labs and Nike Inc. are among the few manufacturers that have taken safety measures Devices and protection of user data. Nest Labs also said "Use advanced data security tools" to protect its products and user data for unauthorized access.

2. The importance of IoT in healthcare

Health care is defined as an act of taking prevention or procedures required to improve human well-being. This can be done surgically, the operation of medicine, or other modification of a person's way of life. These services are usually provided with a health care plan developed by hospitals and doctors.

There are various areas in healthcare that have an important role.

• Care for the elderly, which includes tracking older person accommodation / nursing home and hospital

• Data collection, which is the most mature area in health care, including many equipment ourselves look at the bedside in hospitals as an EKG consultant,

Augmented Reality

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1. Introduction

The field of Augmented Reality (AR) has existed for just over one decade, but the growth and progress in the past few years has been remarkable. In 1997, the first author published a survey (based on a 1995 SIGGRAPH course lecture) that defined the field, described many problems, and summarized the developments up to that point. Since then, the field has grown rapidly. In the late 1990 s, several conferences specializing in this area were started, including the International Workshop and Symposium on Augmented Reality, the International Symposium on Mixed Reality, and the Designing Augmented Reality Environments workshop. Some wellfunded interdisciplinary consortia were formed that focused on AR, notably the Mixed Reality Systems Laboratory in Japan and Project ARVIKA in Germany. A freely-available software toolkit (the ARToolkit) for rapidly building AR applications is now available. Because of this wealth of new developments, an updated survey is needed to guide and encourage further research in this exciting area.

The goal of this new survey is to cover the recent advances in Augmented Reality that are not covered by the original survey. This survey will not attempt to reference every new paper that has appeared since the original survey; there are far too many new papers. Instead, we reference representative examples of the new advances.

What is Augmented Reality? The basic goal of an AR system is to enhance the user s perception of and interaction with the real world through supplementing the real world with 3D virtual objects that appear to coexist in the same space as the real world. Many recent papers broaden the definition of AR beyond this vision, but in the spirit of the original survey we define AR systems to share the following properties:

1) Blends real and virtual, in a real environment
2) Real-time interactive
3) Registered in 3D

Registration refers to the accurate alignment of real and virtual objects. Without accurate registration, the illusion that the virtual objects exist in the real environment is severely compromised. Registration is a difficult problem and a topic of continuing research.

Note that this definition of AR is not restricted to particular display technologies, such as a Head-Mounted Display (HMD). Nor is it limited to the visual sense. AR can potentially apply to all senses, including touch, hearing, etc. Certain AR applications also require removing real objects from the environment, in addition to adding virtual objects. For example, an AR visualization of a building that used to stand at a certain location would first have to remove the current building that exists there today. Some researchers call the task of removing real objects Mediated or Diminished Reality, but this survey considers it a subset of Augmented Reality.

Milgram defined a continuum of Real to Virtual environments, where Augmented Reality is one part of the general area of Mixed Reality. In both Augmented Virtuality and Virtual Environments (a.k.a Virtual Reality), the surrounding environment is virtual, while in AR the surrounding environment is real. This survey focuses on Augmented Reality and does not cover Augmented Virtuality or Virtual Environments.

This new survey will not duplicate the content of the 1997 survey. That paper described potential applications such as medical visualization, maintenance and repair of complex equipment, annotation and path planning. It summarized the characteristics of AR systems, such as the advantages and disadvantages of optical and video approaches to blend virtual and real, and problems in the focus and contrast of displays and the portability of AR systems. Registration was highlighted as a basic problem. The survey analyzed the sources of registration error and described strategies for reducing the errors. Please refer to the original survey for details on these topics.

The remainder of this survey organizes the new developments into the following categories: Enabling Technologies, Interfaces and Visualization, and New Applications. Enabling Technologies are advances in the basic technologies required to build a compelling AR environment: displays, tracking, registration, and calibration. The Interfaces and Visualization section describes new research in how users interact with AR systems and what they see displayed. This covers new

IOT based Object Detection System

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Abstract - Object detection is a computer technology innovation identified with computer vision and image processing that manages to identify occurrences of semantic objects of a specific class, (for example, people, structures, or vehicles) in digital images and videos. Well-informed spaces of object detection incorporate face identification and pedestrian face recognition. Object detection has applications in numerous spaces of computer vision, including image recovery and video surveillance. In its least complex structure, tracking can be characterized as a technique for finishing an article progressive picture casings to decide its overall development as for different items. As such, a tracker relegates predictable marks to the followed objects in various casings of video. One can work on following by forcing limitations on the movement or presence of articles. One can additionally compel the object movement to be of steady speed or quickening dependent on earlier data. Earlier information about the number and the size of items, or the article's appearance and shape can likewise be utilized to improve on the issue.

The physical object detection system for example, through Ultrasonic, infrared, and so on can be joined with Computer Vision for better productivity and accuracy. Computer Vision is the part of the study of computer and programming frameworks that can perceive pictures and scenes. Computer Vision is comprised of different viewpoints, for example, picture acknowledgment, object discovery, picture age, picture super-goal, and some more. Object identification is broadly utilized for face discovery, vehicle recognition, walker tallying, web pictures, security frameworks, and self-driving vehicles. In this venture, we are utilizing profoundly precise article location calculations and techniques, for example, R-CNN, Fast-RCNN, Faster-RCNN, RetinaNet, and quick yet exceptionally exact ones like SSD and YOLO. Utilizing these techniques and calculations, given profound realizing which is likewise founded on AI require bunches of numerical and deep learning framework understanding by utilizing dependencies, for example, Tensor Flow, OpenCV, image and so forth, we can distinguish every single item in the picture by the zone object in a featured rectangular box and recognize every single object and relegate its tag to the object. This likewise incorporates the accuracy of every method for distinguishing objects.

1. INTRODUCTION

IoT (Internet of Things) is a communication network that associates physical or things with one another or with a gathering altogether. The utilization is generally well known these days and its use has ventured into intriguing subjects. Particularly, it is getting more famous to explore in cross subjects, for example, blending brilliant frameworks in with PC sciences and designing applications together. Article identification is one of these subjects. Real-time object discovery is one of the chief fascinating subjects due to its figure costs. Holes in the system, obscure ideas, and deficiency in numerical demonstrating make it harder for planning these registering calculations. Algorithms in these applications can be created within AI as well as mathematical techniques that are accessible in logical writing. These activities are conceivable just if correspondence of items inside themselves in actual space and consciousness of the articles close by. Fake Neural Networks may help in these examinations. In this examination, Yolo calculation which is viewed as a vital component for ongoing item location in IoT is investigated. It is acknowledged and appeared in outcomes that advancement of figuring and investigation of framework aside this examination which accepts Yolo calculation as an establishment point. Accordingly, it is seen that our model methodology has fascinating potential and curiosity.[12]

There are two major problems with the existing tracking algorithms. First, it is the tracking accuracy and robustness. Visual object tracking is a challenging task, especially when faced with difficult tracking conditions e.g., occlusion, object deformation, and background cluttering. The ability to handle these difficulties directly influences the tracking accuracy and robustness of a tracking algorithm. Recently, the adoption of discriminative

Convention To Deploy Internet In Rural And Remote Areas

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Abstract

At present, we seek the service of Internet Service Providers to connect us to the global network. The telephone companies or the telecommunication operators provide this kind of service for us. This is reachable to only one out of three in the world's population. The remaining people are not able to get internet access. It is not an easy task to lay the telecommunication lines all around the world to provide internet connection everywhere. Since the developing countries cannot afford such a huge sum of money to lay fiber cables, this will not be the optimal solution. To provide internet facilities in remote places and rural areas, we need a high-altitude platform. Google came up with an innovative solution to use balloons to provide internet connection in remote regions. Balloons are used for numerous purposes but here it is used to provide internet connection in remote regions. This project is a network of balloons floating in the stratosphere. It acts as a wireless station and provides internet service to rural areas and remote regions in a cost-effective manner.

This technology will replace the existing fiber, optic network system. This will be done by using a tethered balloon along with the payload (containing a receiver, a transmitter, and a radio communication device). This payload will be suspended from the ground at an altitude (depending on the area of coverage required). Users under this area will be able to access this system directly for internet connectivity. This system can be used over large areas like universities, companies and societies to provide internet facility to their users through Wi-Fi or over an area where the user is specified (commercial purposes).

Along with this balloon technique, we have another way to transfer the internet to remote places. which is by using a satellite internet system.

Keywords: *ISP, Remote Areas, Internet Facilities, Global Network, Balloon Technique;*

Introduction

Nowadays, approximately twenty million people are connected to the Internet, but there are more who cannot connect on the web. A large percentage of upcoming web users will come from emerging markets, particularly from countries such as India and Indonesia. India has over 10 billion people; approximately 750 million people live in 637,000 villages in rural India with no internet connectivity. From this, we can say that the next billion web users could come from rural India. Internet connectivity would allow rural Indians the opportunity to achieve economic status.

Rural India's poor infrastructure results in undependable electricity and very low bandwidth with disturbed Internet connectivity which are the reasons for poor rural Internet penetration. Another block is the lack of affordable computer systems and internet connections due to rural people's lower income. India's literacy rate is still below 75 percent as an entire and much lower in rural India. Many attempts have been taken to offer better connectivity over the last decade, including setting up shared telecenters, but none of these efforts has given significant results. Most of rural India remains unconnected.

Comprehensive View of Big Data

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Abstract - **In today's world scenario as the amount of data is increasing day by day the term Big Data is also becoming huge. Big Data is a collection of various forms of data that cannot be managed by traditional data management methods. The need and importance of big data are increasing continuously for the past few years even some organizations are depended on information extracted after analyzing big data for making important decisions. This paper helps to understand Big Data by explaining its characteristics and architecture. It also provides information about major sources of big data, its application in various fields. But as we know, every technology has some limitations, so it also defines the major problems in big data analysis and the solutions required to overcome them. The main aim of the paper is to make the term "big data" more clear by explaining all basic terms related to it, to make working with it easier and more effective.**

Keywords- Big Data, volume, variety, velocity, veracity, value

I. INTRODUCTION

Big Data defines huge and complex data which is increasing exponentially day by day. It is not possible to manage this data with the traditional database management system, as the data can be in any form that is structured data (dataset in a row and column format), unstructured data (audio, video, images, or any other format) or semi-structured data (data in XML, JSON format. Semi-structured data is a combination of both structured and unstructured data) [5].

The term Big Data was first introduced by Roger Mougalas back in 2005. But big data exists in the world for a very long time. 5 exabytes (10 bytes) of data were created by humans till 2003. Now, this amount of data is created within 2 days due to the increase in the use of social media, technologies, and experiments. In 2012 the amount was around 2.72 zettabytes which are becoming double every two years and it is expected to reach 175 zettabytes by 2025. Even a personal computer holds around 500 gigabytes of information, so it requires approximately 20 billion PCs to store all the world's data. Google only has 9 million servers around the world and 8.3 billion mobile subscriptions globally.

So, the need to analyze and store this data properly for future perspectives is very important.

II. CHARACTERISTICS OF BIG DATA

Big Data is categorized or defined in terms of 5 Vs: volume, variety, velocity, veracity, value, Initially, there were only 3 V's of Big data that is velocity, volume, variety. But with the rapid growth of data, two new Vs were introduced that are veracity, value by Gartner to the data processing concepts.

Fig.1 Five Vs of Big data

2.1 Volume- refers to the amount of data that is produced every day. This volume of data is generated from various sources such as the education sector, media, healthcare sector, etc. in different-different formats such as pdf, images, videos, etc. For example- Facebook alone can generate billions of messages and around 350 million posts per day.
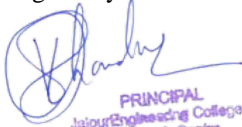
2.2 Variety- defines the nature of data that is structured, unstructured, semi-structured. It shows diversity in data sources and type. In today's world, 80 percent of data is classified as unstructured data.

2.3 Velocity- defines the continuous flow of data through multiple channels social media, mobile phones, computer networks, etc. The data flow is massive and continuous. Velocity determines the speed at which data is processed and generated to meet real-world demands. It is done in a fraction of seconds in real-time.

A Review on Recent Advances in RecurrentNeural Networks

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Abstract - Recurrent neural networks (RNNs) are capable of learning features and long term dependencies from sequential and time-series data. The RNNs have a stack of non-linear units where at least one connection between units forms a directed cycle. A well-trained RNN can model any dynamical system; however, training RNNs is mostly plagued by issues in learning long-term dependencies. In this paper, we present a survey on RNNs and several new advances for newcomers and professionals in the field. The fundamentals and recent advances are explained and the research challenges are introduced.

Keywords - Deep learning, long-term dependency, recurrent neural networks, time-series analysis.

I. INTRODUCTION

Speech is a complex time-varying signal with complex correlations at a range of different timescales. Recurrent neural networks (RNNs) contain cyclic connections that make them a more powerful tool to model such sequence data than feed- forward neural networks. RNNs have demonstrated great success in sequence labeling and prediction tasks such as handwriting recognition and language modeling. In acoustic modeling for speech recognition, however, where deep neural networks (DNNs) are the established state-of-the-art, recently RNNs have received little attention beyond small scale phone recognition tasks, notable exceptions being the work of Robinson [1],Graves [2], and Sak [3].

LSTM and conventional RNNs have been successfully applied to various sequence prediction and sequence labeling tasks. In language modeling, a conventional RNN has obtained significant reduction in perplexity over standard *n*-gram models [6] and an LSTM RNN model has shown improvements over conventional RNN LMs [7]. LSTM models have been shown to perform better than RNNs on learning context- free and context-sensitive languages [8]. Bidirectional LSTM (BLSTM) networks that operate on the input sequence in both directions to make a decision for the current input have been proposed for phonetic labeling of

acoustic frames on the TIMIT speech database [9]. For online and offline handwriting recognition, BLSTM networks used together with a Connectionist Temporal Classification (CTC) layer and trained from unsegmented sequence data, have been shown to outperform a state- of-the-art Hidden-Markov-Model (HMM) based system [10]. Similar techniques with a deep BLSTM network have been proposed to perform grapheme-based speech recognition [11]. BLSTM networks have also been proposed for phoneme prediction in a multi-stream framework for continuous conversational speech recognition [12]. In terms of architectures, following the success of DNNs for acoustic modeling [13, 14, 15, 16], a deep BLSTM RNN combined with a CTC output layer and an RNN transducer predicting phone sequences has been shown to reach state-of-the-art phone recognition accuracy on the TIMITdatabase [17].

II . LSTM Network Architectures

The LSTM contains special units called memory blocks in the recurrent hidden layer. The memory blocks contain memory cells with self-connections storing the temporal state of the network in addition to special multiplicative units called gates to control the flow of information. Each memory block in the original architecture contained an input gate and an output gate. The input gate controls the flow of input activations into the
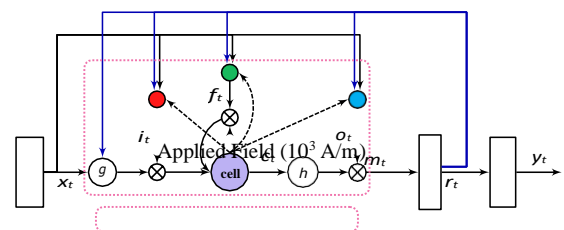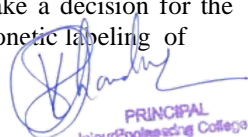

Figure 1: LSTMP RNN architecture. A single memory block isshown for clarity

memory cell. The output gate controls the output flow of cell activations into the rest of the network. Later, the forget gate

5G Mobile Technology: A Review

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Abstract — 5G technology stands for mobile technologies fifth generation from starting generation 1G to 2G and from 3G to 5G the globe of telecommunication has seen a number of improvements along with improved performance every single day. This fast revolution in the era of mobile computing hinges our daily life which is how we work, interact and learn. This paper also shows all receding generations of mobile communication along with fifth-generation technology which provides affordable broadband wireless connectivity. The paper also looks at the network architecture of fifth-generation technology, which mainly focuses on voice over IP (voIP) enabled devices that enables users to experience a high level of call volume and data transmission. 5G network seems to fulfil all the requirements of its users through which they can simultaneously connect to the multiple wireless technologies and can switch between them.

Keywords—5G, 5G Architecture, 1G to 5G, Improvement in generations

I. INTRODUCTION

Communication is typically an important offer of life wireless communication has begun at intervals the first Seventies. At intervals consequent forty years, mobile wireless technology has evolved from 1G to 5G generations. 5G technology provides an extremely high system of measurement that users practiced before from 1G to 4G. The 5G technologies offer varied new advanced choices that build it most powerful and in giant demand at intervals the long run. Recently all totally different wireless and mobile technologies unit of measurement gift like third-generation mobile networks 5G is that the fifth-generation mobile network. It is a fresh world wireless commonplace once 1G, 2G, 3G, and 4G networks. 5G permits a fresh quiet network that is designed to connect nearly everyone and everything on in addition as machines, objects, and devices. 5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra-low latency, further liableness, giant network capability, hyperbolic accessibility, uniform user experience to additional users. Higher performance and improved efficiency empower new user experiences and connect new industries. 5G architectures in addition software-defined platforms, at intervals that networking utility is managed through software package packages rather than hardware. Advancements in virtualization, cloud-based technologies, and IT and business methodology automation amendment 5G style to be agile and versatile and to provide anytime, anywhere user access. 5G networks can turn out softwaredefined subnetwork constructs stated as network slices. These slices enable network administrators to dictate network functionality based on users and devices.

II. BACKGROUND

A. Requirement of 5G system

Mobile communication has become more popular in last few years due to fast revolution in mobile technology. 5G is the next-generation wireless cellular network to fulfill the needs of next generation users with effective features. 5G possesses some characteristics unused in 1G to 4G network technologies. A massive amount of data is generated. According to the International Telecommunication Union (ITU),there are more than 7.5 billion mobile devices around the world in 2017 [1], and the number of mobile devices is expected to increase to 25 billion by 2020 [2], contributing to ultradense networks. Consequently, there is an explosive growth in the amountof data from 16.5 exabytes in 2014 to an estimate of 500 exabytes in 2020 [3], contributing to a growth rate of 30 times.
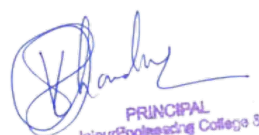
B. How fast is 5G

5G technology network is designed to provide peak data rates up to 20 Gbps based on IMT-2020 requirements. Qualcomm Technologies' flagship 5G solutions, the Qualcomm Snapdragon X55 and Snapdragon X60 Modem-RF Systems, are designed to achieve up to 7.5 Gbps in downlink peak data rates. But the 5G is about more than just how fast it is. In addition to higher peak data rates, 5G is designed to provide much more network capacity by expanding into new spectra, such as mmWave. 5G can also deliver much lower latency for a more immediate response and can provide an overall more uniform user experience so that the data rates stay consistently high—even when users are moving around. And the new 5G NR mobile network is backed up by a Gigabit LTE coverage foundation, which can provide ubiquitous Gigabit-class connectivity [4].

III. EVOLUTION

A. First Generation (1G)

1G emerged in the 1980s. It contains Analog System and popularly known as cell phones. It introduces mobile technologies such as Mobile Telephone System (MTS), Advanced Mobile Telephone System (AMTS), Improved Mobile Telephone Service (IMTS), and Push to Talk (PTT). It uses an analog radio signal which has a frequency of 150 MHz, voice call modulation is done using a technique called Frequency-Division Multiple Access (FDMA). It has low capacity, unreliable handoff, poor voice links, and no security at all since voice calls were played back in radio towers, making these calls susceptible to unwanted eavesdropping by third parties [5].

RETINAL -OCT IMAGE ANALYSIS USING NEURAL NETWORKS (SEGMENTATION AND CLASSIFICATION)

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Abstract—Precise and programmed analysis of retinal images has been considered as an effective way for the determination of retinal diseases. The look at the recent application of deep learning (DL) methods in automated fine-grained segmentation of spectral domain optical coherence tomography (OCT) images of the retina. Lets describe a new method combining fully convolutional networks (FCN) with Gaussian Processes for post processing. The report performance comparisons between the proposed approach, human clinicians, and other machine learning (ML) such as graph based approaches.

The approach is demonstrated on an OCT dataset consisting of mild non- proliferative diabetic retinopathy from the University of Miami. The method is shown to have performance on par with humans, also compares favorably with the other ML. methods, and appears to have as small or smaller mean unsigned error (equal to 1.06), versus errors ranging from 1.17 to 1.81 for other methods, and compared with human error of 1.10.

Keywords: optical coherence tomography (OCT), fully convolutional networks (FCN), Comparisons.

INTRODUCTION-

Classification of optical coherence tomography im- ages can be achieved with high accuracy using classical convolution neural networks (CNN), a commonly used deep learning network for computer-aided diagnosis. Classical CNN has often been criticized for suppressing positional relations in a pooling layer. Therefore, because capsule networks can learn positional information from images, we attempted application of a capsule network to OCT images to overcome that shortcoming. This study is our attempt to improve classification accuracy by replacing CNN with a capsule network.

Early detection and prompt treatment can prevent AMD leading to vision loss. To detect these diseases, optical OCT is the most commonly used imag- ing modality in ophthalmology These initial diseases can be detected by screening with OCT, but increased screening with OCT images multiplies the burdens on ophthalmologists, who must interpret these images. Therefore, an automatic diagnostic screening system has been developed actively to reduce ophthalmologists' burdens.

In the field of medical image classification with deep learning. OCT image classification has been undertaken in earnest. However, traditional CNNs have sometimes been criticized because their pooling oper- ations nearly eliminate positional information Losing positional information might be a bottleneck hindering efforts to improve OCT image classification accuracy.

1. The four major causes of blindness are age-related diseases, out of which three affects the retina.

2. A critical element of the clinical diagnosis is the analysis of individual retinal layer properties, as the manifestation of the dominant eye diseases has been shown to correlate with structural changes to the retinal layers.

3. Regrettably, manual segmentation is dependent on the ophthalmologist's level of expertise, and currently becoming impractical due to advancement in imaging modalities.

4. Inherently, much research on computer-aided diagnostic methods is conducted to aid in extracting useful layer information from these images, which were inaccessible without these techniques. However, speckle noise and intensity inhomogeneity remain a challenge with a detrimental effect on the performance of automated methods. In this paper, we propose a method comprising of fuzzy image processing techniques and graph-cut methods to robustly segment optical coherence tomography (OCT) into five (5) distinct layers. Notably, the method establishes a specific region of interest to suppress the interference of speckle noise, while Fuzzy C-means is utilized to build data terms for better integration into the continuous max-flow to handle inhomogeneity.

METHODS-

1) Preprocessing and data augmentation-: The proposed network model requires a 512 512 image.

However, the dataset images were 384–1536 pixels wide and 496–512 pixels high. Therefore, the images were resized in terms of width and height to 512 pixels using linear interpolation. In addition, the OCT images were shifted by up to 16 pixels in each direction with zero padding to increase the number of learning data.

As a result, the number of images used for learning was increased to 65,536 times (16 16 × 16 ×16).Validation

Covid-19 Data Analysis

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Abstract- The spread of coronavirus in India is increasing at a very fast speed. The Government of India is having a hard time on how to deal with or decrease the spread of covid-19 in India. The main objective of this research is to perform analysis on the covid-19 data and gain insights about the data by using exploratory Data Analysis(EDA). This research includes India's analysis of covid-19 cases till October 2020. The result of the analysis shows the impact of COVID-19 in India on daily and weekly basis, and also the impact of covid-19 cases in different states of India, and what are the most common symptoms of covid-19, and also what are the measures that we can take to prevent being affected from Covid-19.

Keywords— *COVID-19, exploratory data analysis , India's analysis, symptoms, measures*

I. INTRODUCTION

Coronaviruses (CoV) are an oversized cluster of viruses which can cause health problems starting from the cold to more severe diseases like Middle East Respiratory Syndrome and Severe Acute metabolic process. A coronavirus (CoV) is a new virus that has never been identified in humans. COVID-19 is the illness caused by a new coronavirus known as SARS-CoV-2. Several known coronaviruses have been found in animals that haven't yet found in humans. The most common signs of covid-19 virus are fever, dry cough and tiredness. The less known symptoms of covid-19 are aches and pains, pharyngitis, diarrhea, conjunctivitis, headache, loss of taste and smell, a rash on skin and color transformation of fingers and toes. The serious symptoms of covid-19 include difficulty in breathing, chest pain, loss of speech or movement. We should minimize any close contact with anyone who is having respiratory problems like cold and cough. As many of us doesn't know about the health of other people, so it is possible that we may catch covid-19 from them who are having mid cough or who does not feel illness. To get protection from and prevention from COVID-19 you can follow the number of straight-forward steps such as: (i) Continuously sanitizing your hands with an alcohol based sanitizer or washing your hands with soap, (ii) Do not touch your eyes and nose as it will cause the virus to enter your body, (iii) If you are having cold or cough and feeling unwell, then stay at home and take advice from the doctor for proper consultation, (iv) Do not go outside your house if it is not necessary and if your work can be done from home, (v) Do follow the guidelines of the Government as they have maximum information about the disease.

II. LITERATURE SURVEY

In paper [1], the researchers have implemented exploratory data analysis on Covid-19 data. The analysis focuses on the statistical information about covid-19 such as what are the number of confirmed cases, deaths, recovered cases and active cases in different states of India.

In paper [2], the authors review and analyze the covid-19 spreading statistics in different countries using the Bailey's method. The World Health Organization reports were considered when performing the analysis of different countries.
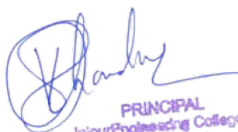
In paper [3], the authors have performed data visualization techniques using different data visualization libraries in python to get the graphical representation of the covid-19 cases. This also involves visualizing the covid-19 cases in the lockdown period and how the cases had been decreased gradually in that period.

In paper [4], the researchers study and analyze the influence of air temperature on the transmission of covid-19 and they find out that the arrival of summer and rainy season can to some extent reduce the transmission of covid-19. They also observed the different symptoms that are caused due to covid-19.

In paper [5], the researchers study and analyze the origin of covid-19 as well as it covers the entire "coronavirus cycle" in great detail.

III.I MPORTANCE OF COVID-19 INDIA'S DATA ANALYSIS

The main objective of this analysis is to keep the track of the amount of covid 19 cases in India. This analysis tells the number of active cases, confirmed cases, deaths and fatality rate in India and what are the current trends in the rise of covid-19 cases and the prediction of the number of covid cases in India.

Analysis on Algorithm Visualization Study

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ABSTRACT

This paper reports on an ongoing study, which intends to propose a principle of interactive algorithm visualization on hybrid mobile application (INAVOHMA) that is created in order to help IT students learn data structure and algorithm (DSA) subject. Totally, 8 existing AV guidelines and models were reviewed comprehensively with the main purposes (1) to determine the research gaps in proposing principles of INAVOHMA and (ii) to identify their common components. Through a systematic and critical analysis, this study discovers there is still lack of inclusive principles or guidelines of AV that focused on mobile platform, mostly fo r desktop or website platform. Only, two guidelines draw attention to mobile platform, yet the focus of them just for sorting algorithm only. It is noted that this is the research gap that should be the focal point for further study.

General Terms

Algorithm, Software engineering, Data structure and algorithm

Keywords

Algorithm Visualization, Critical Analysis, Finding Gaps, Paper Submission.

1. INTRODUCTION

Understanding Data Structures and Algorithm (DSA) course which contains the arrangement of algorithm theory is a tru ly difficult errand in faculty of computer science [1 -2]. DSA is one of the most imperative subjects, but the abstract nature o f it makes this subject becoming the hardest one to learn [3]. Generally, the difficulty relies on algorithm itself which derived from dynamic step by step processes.

Reference [4] mentioned four difficulties that students and lecturers have to face: first problem is students have low motivation. The second is the abstract of DSA concepts makes it difficult and tricky to explain. Third, the cooperation between students in doing assignment is still low. Fourth, it is hard to implement the algorithm into real-life setting.

Primarily, this course is taught through conventional approach (PowerPoint and books). Particularly, the set of images are used to elaborate the processes occurred in an algorithm. Nevertheless, this way is still problematic during data structure presentation (image transition and its process) [5]. This is due to the dynamic and complicated transitions in an algorithm will be hard to be grasped by students if it just depends on static images. Moreover, another possibility is that the tutors could teach them so fast before students can d iges t the previous process [6]. The sequences of the illustration' processes of an algorithm can be also drawn into a board. This way, in terms of understanding, the students maybe are able to follow, but it is time consuming.

Therefore, to resolves the issues, tutors or lectures star ted to use algorithm visualization (AV) system [7]. AV is a s y s tem that is created to visualize the processes of an algorithm in DSA subject. Meaning, the presentation of dynamic visualizations (animation) can ease in learning and teaching environment.

Originally, AV system was utilized passively as animation movie. Nevertheless, the researchers, for instance, [8] confirmed from the result of their research that AV movie, which is presented passively, only gave a little influence to students' comprehension.

The AV system needs to be built actively. In other words, interactivity has to become the most important components in AV system. As proved from studies by [8, 9, 10] th at s tated the students' engagement through active learning environment is the key success of leaning AV system. The motivation of students is boosted up through active AV learning.

Naps et al. [9] have listed six interactive levels of student during learning AV system, namely: no viewing, viewing, responding, changing, constructing, and presenting. The f ir s t is the lowest level, which is no viewing. No viewing only provides plain explanation towards an algorithm, which is usually presented using texts and images. On the other h an d , presenting is the highest level of interaction. Hence, many studies of AV [11-15] highly suggested to include interactivity as the most important elements in order to guarantee engaging learning environment among DSA students.

Not only to be active, the variety of interaction level is also needed to keep the more engagement and motivation in long run [16-17]. For examples, game concept activity, problem- solving exercises, mouse viewing activity, and so forth.

Understanding Data Structures and Algorithm (DSA) course which contains the arrangement of algorithm theory is a tr u ly difficult errand in faculty of computer science [2, 18]. DSA is one of the most imperative subjects, but the abstract nature o f it makes this subject becoming the hardest one to learn [1 4]. Generally, the difficulty relies on algorithm itself which derived from dynamic step by step processes.

However, despite many studies have conducted AV study, but the study of AV on mobile platform is still lacking [4]. In conjunction, this study tries to review previous studies, involving 10 models and guidelines, to define the research gap in proposing the principles of interactive algorithm visualization on hybrid mobile application (INAVOHMA).

HoneyPot: Tracking Cyber Criminals

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Abstract—as the number of devices on computer networks are increasing at great speed, in the same way the number of cyber-attacks are increasing. And these increasing number of network attacks can harm our information system effectively. In order to deal with these cyber-attacks we need a system that has the capacity to track these attacks and counteract them. "Honeypot is a defense technology in which resources placed in a network, which lure the hackers with the aim to observe and capture new attacks"

Keywords—Honeypot, control center, firewall, Intrusion detection, network security

I. INTRODUCTION

The devices connected over the computer network are increasing rapidly and as a consequence the number of network-based attacks also increased. Cybint Solutions estimates that these attacks are approximately 765 million. For such a vast number of attacks it is necessary to find out the defense solution. And one such defence mechanism is honeypots. Honeypot is a cyber-security mechanism which helps the users to detect and counteract the actions of the illegal users on the information security system. This also helps us to determine which security systems are at their best conditions and which security protocols require an update or improvement. It is a proactive technology that intentionally encourages the hackers to attack the computer network and take their records and data with the aim to observe capture the new attacks. Honeypots can be used for a variety of purposes such as observation, detection, and prevention and information collection.
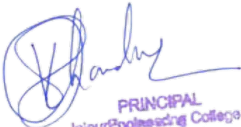
Honeypot is divided into two categories, namely high interaction honeypots and low interaction honeypots. High-interaction honeypots are real time operating systems which are quite complex and includes the routers and switches. These systems provide detailed picture of how an attack is executed in real time systems. While low-interaction honeypots systems provide very less interaction between the system and the hackers.

II. HISTORY

The possibility of honeypots started in 1991 with two distributions, "The Cuckoo's Egg" and "An Evening with Berferd"."The Cuckoo's Egg" by Clifford Stoll was about his experience getting a PC programmer that was in his enterprise looking for privileged insights. The other distribution, "An Evening with Berferd" by Bill Cheswick is about a PC programmer's travels through snares that he and his partners used to get him. In both of these works were the beginnings of what became honeypots.

The main sort of honeypot was discharged in 1997 called the Deceptive Toolkit. The point of this pack was to utilize duplicity to assault back. In 1998 the principal business honeypot turned out. This was called Cybercop Sting. In 2002 the honeypot could be shared and utilized everywhere throughout the world. From that point forward honeypot innovation has improved enormously and numerous honeypot clients feel this is just the starting. In the year 2005, The Philippine Honeypot Project began to advance PC wellbeing over in the Philippines.

Loan Risk Prediction Using Transaction Information

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Abstract

In today's world there are many risks involved in bank loans, so as to reduce their capital loss; banks should perform the risk and assessment analysis of the individual before sanctioning loan. In the absence of this process there are many chances that this loan may turn in to bad loan in near future. Banks hold huge volumes of customer behavior related data from which they are unable to arrive at a decision point i.e. if an applicant can be defaulter or not. This can be achieved using the data mining techniques. Data analysis can be done using the data mining techniques. Here customers data sets compared with the trained data sets and depend on that comparison final prediction can be done. Data Mining is a promising area of data analysis which aims to extract useful knowledge from tremendous amount of complex data sets. We are going to implement a model for the bankers that help them predict the credible customers who have applied for loan. This model can be used by the organizations in making the right decision to approve or reject the loan request of the customers. Bank plays a vital role in market economy. The success or failure of organization largely depends on the industry's ability to evaluate credit risk. Before giving the credit loan to borrowers, bank decides whether the borrower is bad (defaulter) or good (non defaulter).The prediction of borrower status i.e. in future borrower will be defaulter or non defaulter is a challenging task for any organization or bank. Basically the loan

defaulter prediction is a binary classification problem. Loan amount, costumer's history governs his credit ability for receiving loan. The problem is to classify borrower as defaulter or nor defaulter. However developing such a model is a very challenging task due to increasing in demands for loans. Prototypes of the model which can be used by the organizations for making the correct or right decision for approve or reject the request for loan of the customers. This work includes different machine learning models. Based on our demands and requirements, we may need to choose different methods.

keywords

loan risk , Loan defaulter prediction, binary classification problem ,predicting future of loan by machine learning

I.Introduction

There are various areas in which data mining can be used in financial sectors like customer segmentation and profitability, high risk loan applicants, predicting payment default, marketing, credit analysis, ranking investments, fraudulent transactions, optimizing stock portfolios, cash management and forecasting operations, most profitable Credit Card Customers and Cross Selling. There are many different types of loans you have to take into account when you're looking to borrow money and it's important to know your options. Loan categorization refers to the process of evaluation loan collections and assigning loans to groups or grade based on the perceived danger and other related loans properties. The process of monitoring the quality of the loan portfolios and to take action to counter fall in the credit quality of the portfolios.

continual review and classification of loans enables

SALES DATA ANALYSIS FOR DIFFERENT STORES

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Abstract

With consumers shifting more of their spending from physical stores to e-commerce and increasingly looking for experiences rather than products, mall operators face serious headwinds. As we discussed in a recent article, malls will survive in this new environment only if they reinvent their business—for example, by tapping into new technologies and modern analytical capabilities. Big data is a new driver of the world economic and societal changes. The world's data collection is reaching a tipping point for major technological changes that can bring new ways in decision making, managing our health, cities, finance and education. While the data complexities are increasing including data's volume, variety, velocity and veracity, the real impact hinges on our ability to uncover the 'value' in the data through Data Analytics technologies. Data Analytics poses a grand challenge on the design of highly scalable algorithms and systems to integrate the data and uncover large hidden values from datasets that are diverse, complex, and of a massive scale. Huge information is an assortment of informational indexes which is enormous in size just as unpredictable. For the most part size of the information is Petabyte and Exabyte. Customary information base frameworks can't catch, store and examine this enormous measure of information.

Advanced analytics, in particular, has the potential to revolutionize almost all areas of the mall business. Unfortunately, many mall operators lag behind their tenants when it comes to using advanced analytics. One oft-cited explanation is that malls haven't traditionally interacted directly with consumers, so they don't have much consumer data to analyze. But we've found that malls already have access to significant amounts of data, including data on shopper behavior, tenant sales, and category performance. What they don't typically have are the analytical skills and tools to generate insights from the data. Most mall operators still make decisions based on tradition, experience, or intuition— thereby leaving value on the table

I. Introduction

Performing sales analysis gives you valuable insight into the inner-workings of your business. Merchants use their data to make informed decisions like when to raise or lower prices on your products. These decisions shouldn't always be a "gut" feeling. Sometimes it can be reliable, but it shouldn't be your only decision-making tool. When looking for trends or patterns in your sales data, you can determine both opportunities and potential problems. You can track if a particular product is increasing or decreasing in sales. If it's declining, you can make timely decisions such as to cut prices, market more, or discontinue the product. If an item is selling off the shelves, you can be sure to stock inventory accurately across channels. Sales trend analysis also helps you determine if you're meeting your sales goals by providing you an easy, measurable way to track your progress. You'll actually know if you increased sales from last year and by what percentage. If you didn't meet a goal, you can drill down to sales of a specific product or location to see what's stopping you. All retailers should have the ability to become data-driven businesses. With the right capabilities, you can have confidence in the decisions you make because they are backed by your own data. Sales analysis is mining your data to evaluate the performance of your sales team against its goals. It provides insights about the top performing and underperforming products/services, the problems in selling and market opportunities, sales forecasting, and sales activities that generate revenue.

Google Lens

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Abstract - Biology is a fairly complicated initial subject because it involves knowledge of biodiversity. Google Lens is a unique, mobile software that allows you to recognition species and genus of the plant student looking for. The article devoted to the analysis of the efficiency of the functioning of the Google Lens related to botanical objects. In order to perform the analysis, botanical objects were classified by type of the plant (grass, tree, bush) and by part of the plant (stem, flower, fruit) which is represented on the analyzed photo. It was shown that Google Lens correctly identified plant species in 92.6% cases. This is a quite high result, which allows recommending this program using during the teaching. The greatest accuracy of Google Lens was observed under analyzing trees and plants stems. The worst accuracy was characterized to Google Lens results of fruits and stems of the bushes recognizing. However, the accuracy was still high and Google Lens can help to provide the researches even in those cases. Google Lens wasn't able to analyze the local endemic Ukrainian flora. It has been shown that the recognition efficiency depends more on the resolution of the photo than on the physical characteristics of the camera through which they are made. In the article shown the possibility of using the Google Lens in the educational process is a simple way to include principles of STEM-education and "New Ukrainian school" in classes.

Index Terms - Google Lens, plant recognition, digital education.

1. INTRODUCTION
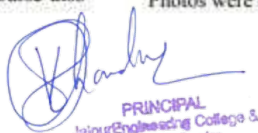
The school biology course is quite complicated because it includes a huge number of abstract concepts and terms [4]. In addition, the school biology course also involves the study of species diversity learning [7]. Ukraine has a rich biota with more than 25,000 species of plants (5,100 vascular plants, more than 15,000 mushrooms and mollusks, more than 1,000 lichens, almost 800 mosses and about 4,000 algae) and 45,000 species of animals (more than 35 000 insects, almost 3 500 other arthropods, 1800 protozoa, 1600 roundworms, 1280 flatworms and 440 ringworms among more than 44 thousand invertebrates, about 200 fish and roundworms, 17 amphibians, 21 reptiles, about 400 birds and 108 mammals from the vertebrates) and is characterized by a certain endemism. A school teacher cannot perfectly know all kinds of species. He may face the problem: "the students brought a photo of a plant or animal and want to determine the species of this plant or animal". One of the ways to solve it is the use of a Google Lens. The absence of the answer will lead to decreasing of student's motivation which is even more important than the fact of absence of the answer. According to the concept of a new Ukrainian school, students need to develop information and digital competencies, which involves the confident and meaningful use of information technology to receive, transmit information [3]. Google Lens allows students to set their own, in their convenient mode, during field or classroom classes, with both informational competence as well as competence in science and technology.

2. Materials and methods

2.1 Model experiment

To provide experiment and compare results with keys for each plant, 500 photos from online-classifier "The list of plants of the Dneprovskiy district of Kiev" (Fig. 2) were taken. The online-classifier contains the pictures of each kind of the plants and its determination names. Photos were characterized by the method described in 2.2

Data Security in Cloud Computing

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Abstract— Data security has consistently been a major issue in information technology. In the cloud computing environment, it becomes particularly serious because the data is located in different places even on the entire globe. Data security and privacy protection are the two main factors of user's concerns about cloud technology. Though many techniques on the topics in cloud computing have been investigated in both academics and industries, data security and privacy protection are becoming more important for the future development of cloud computing technology in government, industry, and business. Data security and privacy protection issues are relevant to both hardware and software in the cloud architecture. This study is to review different security techniques and challenges from both software and hardware aspects for protecting data in the cloud and aims at enhancing the data security and privacy protection for the trustworthy cloud environment. In this paper, we make a comparative research analysis of the existing research work regarding the data security and privacy protection techniques used in cloud computing.

Keywords—Cloud computing, Cloud Computing,

data security, confidentiality, integrity, availability, access control.

I. INTRODUCTION

Cloud computing has been envisioned as the next-generation paradigm in computation. In the cloud computing environment, both applications and resources are delivered on-demand over the Internet as services. Cloud is an environment of the hardware and software resources in the data centers that provide diverse services over the network or the Internet to satisfy user's requirements.

Cloud computing can be considered as a new computing archetype that can provide services on demand at a minimal cost. The three well-known and commonly used service models in the cloud paradigm are a *software as a service* (SaaS), *platform as a service* (PaaS), and *infrastructure as a service* (IaaS). In SaaS, software with the related data is deployed by a cloud service provider, and users can use it through web browsers. In PaaS, a service provider facilitates services to the users with a set of software programs that can solve specific tasks. In IAAS, the cloud service provider facilitates services to the users with virtual machines and storage to improve their business capabilities.

Data security has consistently been a major issue in IT. Data security becomes particularly serious in the cloud computing environment because data are scattered in different machines and storage devices including servers, PCs, and various mobile devices such as wireless sensor networks and smartphones. Data security in cloud computing is more complicated than data security in the traditional information systems
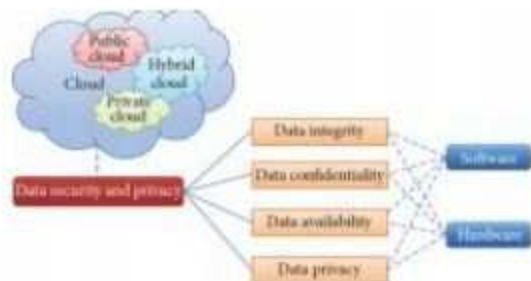

Figure 1: Organisation of data security and privacy in cloud computing

II. SERVICE MODELS

A. INFRASTRUCTURE AS A SERVICE (IAAS)

Is considered the most basic cloud model, in IaaS, public cloud operators provide computing as virtual or physical servers among IT services. VMs can run as guest machines using hypervisors from different vendors such as VMware or Microsoft. also Infrastructure as a service (IaaS) clouds include images in a virtual machines library, firewalls, raw and file-based storage, IP addresses, load balancers, and software bundles. For a wide area, both Internet and dedicated virtual private networks can be used.

B. PLATFORM AS A SERVICE (PAAS)

In this model, providers offer a computing platform typically including operating systems, databases, programming languages, execution environment, and a web server. Application programmers can develop and run their solutions on a cloud platform without the costs of buying and managing the hardware and software layers. In some offers of Platform as a service model, the computing power could be scaled according to workload so the customer doesn't need manual allocation of IT services.

Credit Card Fraud Detection By Data Analytics Using Python

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Abstract— It is vital that credit card companies are able to identify fraudulent credit card transactions so that customers are not charged for items that they did not purchase. Such problems can be tackled with Data Science and its importance, along with Machine Learning, cannot be overstated. This project intends to illustrate the modelling of a data set using machine learning with Credit Card Fraud Detection. The Credit Card Fraud Detection Problem includes modelling past credit card transactions with the data of the ones that turned out to be fraud. This model is then used to recognize whether a new transaction is fraudulent or not. Our objective here is to detect 100% of the fraudulent transactions while minimizing the incorrect fraud classifications.

Keywords— Introduction; Literature Review; Methedology; Conclusion.

I. INTRODUCTION

'Fraud' in credit card transactions is unauthorized and unwanted usage of an account by someone other than the owner of that account. Necessary prevention measures can be taken to stop this abuse and the behaviour of such fraudulent practices can be studied to minimize it and protect against similar occurrences in the future.In other words, Credit Card Fraud can be defined as a case where a person uses someone else's credit card for personal reasons while the owner and the card issuing authorities are unaware of the fact that the card is being used.Fraud detection involves monitoring the activities populations of users in order to estimate, perceive or avoid objectionable behaviour, which consist of fraud, intrusion, and defaulting.This is a very relevant problem that demands the attention of communities such as machine learning and data science where the solution to this problem can be automated.This problem is particularly challenging from the perspective of learning, as it is characterized by various factors such as class imbalance. The number of valid transactions far outnumber fraudulent ones. Also, the transaction patterns often change their statistical properties over the course of time.

These are not the only challenges in the implementation a real-world fraud detection system, however. In real world examples, the massive stream of payment requests is quickly scanned by automatic tools that determine which transactions to authorize.

Machine learning algorithms are employed to analyse all the authorized transactions and report the suspicious ones. These reports are investigated by professionals who contact the cardholders to confirm if the transaction was genuine or fraudulent.

The investigators provide a feedback to the automated system which is used to train and update the algorithm to eventually improve the fraud-detection performance over time.

Fraud detection methods are continuously developed to defend criminals in adapting to their fraudulent strategies. These frauds are classified as:

Credit Card Frauds: Online and Offline Card Theft
Account Bankruptcy
Device Intrusion
Application Fraud
Counterfeit Card

Some of the currently used approaches to detection of such fraud are:

Artificial Neural
Network Fuzzy Logic
Genetic
Algorithm
Logistic
Regression
Decision tree
Support Vector
Machines Bayesian
Networks Hidden
Markov Model
K-Nearest Neighbour

These are not the only challenges in the implementation of a real-world fraud detection system, however. In real world examples, the massive stream of payment requests is quickly scanned by automatic tools that determine which transactions to authorize.Machine learning algorithms are employed to analyse all the authorized transactions and report the suspicious ones.

Solution of fractional kinetic equations by using integral transform

Garima Agarwal, and Ruchi Mathur

Solution of Fractional Kinetic Equations by using Integral Transform

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Abstract. In the present article the author develop the solution of Fractional Kinetic Equation in a new and further generalized form by involving the ζ-Gauss Hypergeometric Functions as Kinetic Equations are having great importance in certain astrophysical problems. The change of chemical composition in star like the sun can be computed by this new generalized form of Kinetic equations. The main fold generality of the ζ-Gauss Hypergeometric Functions is discussed in terms of the solution of the Fractional Kinetic Equation. Special case involving the Gauss Hypergeometric function are also considered. The obtained results imply more precisely the known results and easily computable solution can also be established by the given results.

INTRODUCTION

Fractional Kinetic Equations

Nuclear reaction has been done in two forms called as Fission and Fusion. If atomic nuclei splitting into smaller subatomic particles then it is called Fission and and if from the nuclei of small atoms the large atoms are created then it is called Fusion. During this process, part of mass of the fused nucleus is converted onto energy and released as heat, light or various forms of radiations. It is highly energetic process and also an example of thermonuclear reactions. Stars themselves are formed and fueled naturally throughout the universe. In this process the large amount of solar energy have produced in this process. Rate of change of $\aleph$ with respect to time t is given by the following equation

$$d\aleph/dt = -\psi + \omega \tag{1}$$

where ψ and ω are destruction and production rate of $\aleph$ respectively.
Equation (1) can be written as:

$$d\aleph/dt = -\psi(\aleph_t) + \omega(\aleph_t) \tag{2}$$

$$\aleph(t) = \aleph_0 \sum_{n=0}^{\infty} \frac{(-1)^n}{\Gamma(vn+1)} (ct)^{vn} \tag{3}$$

$$d\aleph_i/dt = -c_i\aleph_i(t) \tag{4}$$

Now after integrating and declining the index i, (2) reduces to

$$\aleph(t) - \aleph_0 = -c_0\,_0D_t^{-1}\aleph(t) \tag{5}$$

where $_0D_t^{-1}$ is the well known Riemann-Liouville fractional integral operator [9],[4],[3].
Generalized fractional kinetic equation is defined as [5]:

$$\aleph(t) - \aleph_0 f(t) = -c^v\,_0D_t^{-v}\aleph(t), R(v) > 0 \tag{6}$$

where

$$_0D_t^{-\nu}\aleph(t) = \frac{1}{\Gamma(\nu)} \int_0^t (t-u)^{\nu-1}\aleph(u)du, t > 0, R(\nu) > 0 \tag{7}$$

where $_0D_t^{-\nu}$ is the well known Rieman-Liouville fractional integral operator [9]. A significant amount of study on fractional kinetic equations have been carried out by [6, 7].

P_χ-Transform

The P_χ-Transform of a function is defined as [3]:

$$P_\chi[f(\varphi); s] = F(s) = \int_0^\infty [1 + (\chi - 1)s]^{\frac{-\varphi}{\chi-1}} f(\varphi)d\varphi, \chi > 1 \tag{8}$$

$$\lim_{\chi \to 1+} [1 + (\chi - 1)s]^{\frac{-\varphi}{\chi-1}} = e^{-s\varphi}$$

It is the extension of Laplace transform from binomial form $[1 + (\chi - 1)s]^{\frac{-\varphi}{\chi-1}}$ to the exponential form $e^{-s\varphi}$. The P_χ-transform eventually leads to the Laplace transform when χ tends to 1.

$$\lim_{\chi \to 1} P_\chi[f(\varphi); s] = L[f(\varphi); s]$$

By this transform, we get a wide class of integrals varying from Binomial to exponential function.
Following are the P_χ-Transform of some elementary functions [3]

$$P_\chi[1; s] = \frac{\chi - 1}{ln[1 + (\chi - 1)s]} \tag{9}$$

$$P_\chi[\frac{\varphi^n}{n!}; s] = \{\frac{\chi - 1}{ln[1 + (\chi - 1)s]}\}^{n+1} \tag{10}$$

$$P_\chi[\varphi^{\rho-1}E_{\phi,\rho}^\nu(b\varphi^\phi); s] = \left[\frac{\chi - 1}{ln[1 + (\chi - 1)s]}\right]^\rho \left[1 - \frac{b(\chi - 1)\phi}{\{ln1 + (\chi - 1)s\}}\right]^{-\nu} \tag{11}$$

where

$$\rho, \gamma, b \in C, \phi \in R^+, \chi > 1$$

$$P_\chi[_0D_t^{-\nu}f(\varphi); s] = \left[\frac{\chi - 1}{ln\{1 + (\chi - 1)s\}}\right]^\nu P_\chi[f(\varphi); s] \tag{12}$$

where $\nu \in C, \chi > 1$.

ζ-Gauss Hypergeometric functions

Dinesh.et.al [2] gives the definition of ζ-Gauss Hypergeometric functions as:
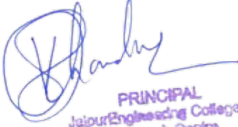
$$_\chi F_\phi^\zeta(\varphi) =_\chi F_\phi^\zeta \begin{bmatrix} (a_1,r),a_2,....a_\chi; \\ b_1,b_2,.....b_\phi; \end{bmatrix} \varphi \tag{13}$$

$$= \sum_{n=0}^\infty \frac{(a_1;r)_n, (a_2)_{\zeta n}, ...(a_\chi)_{\zeta n}}{(b_1)_{\zeta n}, (b_2)_{\zeta n}, ...(b_\phi)_{\zeta n}} \frac{\varphi^n}{n!} \tag{14}$$

where $a_j \in C(j = 1, 2, ..\chi), b_j \in \frac{C}{Z_0}(j = 1, 2, ..\phi), |\varphi| < 1, \zeta \in R, r \geq 0$
If we set $\zeta = 1$ in (18), then it reduces to generalized hypergeometric function [8]

$$_\chi F_\phi \begin{bmatrix} (a_1,r),a_2,....a_\chi; \\ b_1,b_2,.....b_\phi; \end{bmatrix} \varphi = \sum_{n=0}^\infty \frac{(a_1;r)_n, (a_2)_n, ...(a_\chi)_n}{(b_1)_n, (b_2)_n, ...(b_\phi)_n} \frac{\varphi^n}{n!} \tag{15}$$

which on substituting $r = 0$ reduces to Gauss Hypergeometric function[1]

$$\chi F_\phi(\varphi) = \sum_{n=0}^{\infty} \frac{(a_1)_n, (a_2)_n, ...(a_\chi)_n}{(b_1)_n, (b_2)_n, ...(b_\phi)_n} \frac{\varphi^n}{n!} \tag{16}$$

If we put $\chi = 2, \phi = 1$, then (13) reduces to extended $\zeta-$ hypergeometric function [2] defined as

$${}_2F_1^\zeta(\varphi) = \frac{\Gamma(c)}{\Gamma(b)} \sum_{n=0}^{\infty} \frac{(a)_n \Gamma(b + \zeta n)}{\Gamma(c + \zeta n)} \frac{\varphi^n}{n!} \tag{17}$$

Also, on setting $\chi = 3, \phi = 2$ in (13), we get the expression for ${}_3R_2^\zeta(\varphi)$ (see [1, 2])
The derivative formula for Generalized ζ-Gauss Hypergeometric functions is defined as [2]:

$$\frac{d}{dz}\{\chi F_\phi^\zeta \begin{bmatrix} (a_1,r),a_2,....a_\chi; \\ b_1,b_2,.....b_\phi; \end{bmatrix} \varphi \} = \left[\chi F_\phi^\zeta(\varphi)\right]' = \left[\frac{(a_1)_1(a_2)\zeta...(a_\chi)_\zeta}{(b_1)_\zeta(b_2)\zeta...(b_\phi)_\zeta}\right] \chi F_\phi^\zeta \begin{bmatrix} (a_1+1,r),a_2+\zeta,....a_\chi+\zeta; \\ b_1+\zeta,b_2+\zeta,.....b_\phi+\zeta; \end{bmatrix} \varphi \tag{18}$$

Main Result

Theorem 1 If $d > 0, \nu > 0, \varphi \in C, \zeta \in R, \zeta > 0$ then the solution of fractional kinetic equation:

$$\aleph(\varphi) - \aleph_0 {}_r F_q^\zeta(\varphi) = -d^\nu {}_0 D_t^{-\nu} \aleph(\varphi) \tag{19}$$

is given by

$$\aleph(\varphi) = \aleph_0 \sum_{n=0}^{\infty} \frac{(a_1; \phi)_n, (a_2)_{\zeta n}, ...(a_r)_{\zeta n}}{(b_1)_{\zeta n}, (b_2)_{\zeta n}, ...(b_q)_{\zeta n}} \sum_{k=0}^{\infty} (-1)^k (d)^{k\nu} \frac{\varphi^{k\nu+n}}{(k\nu + n)!} \tag{20}$$

Proof Taking P_χ-Transform of both the sides of (19), then in view of (10) and (12) we get

$$P_\chi[\aleph(\varphi)]\left[1 + d^\nu \left\{\frac{\chi - 1}{ln\{1 + (\chi - 1)p\}}\right\}^\nu\right] = \aleph_0 \sum_{n=0}^{\infty} \frac{(a_1; \phi)_n, (a_2)_{\zeta n}, ...(a_r)_{\zeta n}}{(b_1)_{\zeta n}, (b_2)_{\zeta n}, ...(b_q)_{\zeta n}} \left[\frac{ln\{1 + (\chi - 1)p\}}{\chi - 1}\right]^{-n-1} \tag{21}$$

$$P_\chi[\aleph(\varphi)] = \aleph_0 \sum_{n=0}^{\infty} \frac{(a_1; \phi)_n, (a_2)_{\zeta n}, ...(a_r)_{\zeta n}}{(b_1)_{\zeta n}, (b_2)_{\zeta n}, ...(b_q)_{\zeta n}} \left[\frac{ln\{1 + (\chi - 1)p\}}{\chi - 1}\right]^{-n-1} \sum_{k=0}^{\infty} \frac{(-1)_k}{k!} \left[\frac{d(\chi - 1)}{ln\{1 + (\chi - 1)p\}}\right]^{k\nu} \tag{22}$$

$$= \aleph_0 \sum_{n=0}^{\infty} \frac{(a_1; \phi)_n, (a_2)_{\zeta n}, ...(a_r)_{\zeta n}}{(b_1)_{\zeta n}, (b_2)_{\zeta n}, ...(b_q)_{\zeta n}} \sum_{k=0}^{\infty} (-1)^k d^{k\nu} (\chi - 1)^{n+1+k\nu} [ln\{1 + (\chi - 1)p\}]^{-k\nu-n-1} \tag{23}$$

Now on applying Inverse P_χ-Transform we readily get the desired result.

Theorem 2 If $d > 0, \nu > 0, \varphi \in C, \zeta \in R, \zeta > 0$ then the solution of fractional kinetic equation:
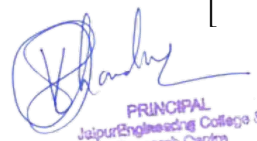
$$\aleph(t) - \aleph_0 \{_r F_q^\zeta(\varphi)\}' = -d^\nu {}_0 D_\varphi^{-\nu} \aleph(\varphi) \tag{24}$$

is given by

$$\aleph(\varphi) = \aleph_0 \left[\frac{(a_1)_1(a_2)\zeta...(a_r)_\zeta}{(b_1)_\zeta(b_2)\zeta...(b_s)_\zeta}\right] \sum_{n=0}^{\infty} \frac{(a_1 + 1, p)_n (a_2 + \zeta)n...(a_r + \zeta)_n}{(b_1 + \zeta)_{\zeta n}(b_2 + \zeta)\zeta n...(b_s + \zeta)_{\zeta n}} \varphi^n \sum_{k=0}^{\infty} \frac{(-1)^k (d\varphi)^{k\nu}}{(k\nu + n)!} \tag{25}$$

Proof. Taking P_χ-Transform of both the sides of (24), then in view of (10),(12) and (17) we get

$$P_\chi[\aleph(\varphi)]\left[1 + d^\nu \left\{\frac{\chi - 1}{ln\{1 + (\chi - 1)p\}}\right\}^\nu\right] = \aleph_0 \left[\frac{(a_1)_1(a_2)\zeta...(a_r)_\zeta}{(b_1)_\zeta(b_2)\zeta...(b_s)_\zeta}\right] \sum_{n=0}^{\infty} \frac{(a_1 + 1, p)_n (a_2 + \zeta)n...(a_r + \zeta)_n}{(b_1 + \zeta)_{\zeta n}(b_2 + \zeta)\zeta n...(b_s + \zeta)_{\zeta n}}$$

$$\left[\frac{ln\{1 + (\chi - 1)s\}}{\chi - 1}\right]^{-n-1} \tag{26}$$

$$P_\chi[\aleph(\varphi)] = \aleph_0 \left[\frac{(a_1)_1(a_2)\zeta...(a_r)_\zeta}{(b_1)_\zeta(b_2)\zeta...(b_s)_\zeta}\right] \sum_{n=0}^{\infty} \frac{(a_1+1,p)_n(a_2+\zeta)n...(a_r+\zeta)_n}{(b_1+\zeta)_{\zeta n}(b_2+\zeta)\zeta n...(b_s+\zeta)_{\zeta n}} \left[\frac{ln\{1+(\chi-1)s\}}{\chi-1}\right]^{-n-1}$$

$$\sum_{k=0}^{\infty} \frac{(-1)_k}{k!}\left[\frac{d(\chi-1)}{ln\{1+(\chi-1)p\}}\right]^{k\nu} \tag{27}$$

$$= \aleph_0 \left[\frac{(a_1)_1(a_2)\zeta...(a_r)_\zeta}{(b_1)_\zeta(b_2)\zeta...(b_s)_\zeta}\right] \sum_{n=0}^{\infty} \frac{(a_1+1,p)_n(a_2+\zeta)n...(a_r+\zeta)_n}{(b_1+\zeta)_{\zeta n}(b_2+\zeta)\zeta n...(b_s+\zeta)_{\zeta n}} [ln\{1+(\chi-1)s\}]^{-k\nu-n-1} \sum_{k=0}^{\infty}(-1)^k d^{k\nu}(\chi-1)^{n+1+k\nu} \tag{28}$$

Now on applying Inverse P_χ-Transform we readily get the desired result.

Special cases

(i) If we take $r=2, q=1$ then (20) reduces to

$$\aleph(\varphi) - \aleph_0 \, {}_2F_1^\zeta(\varphi) = -d^\nu \, {}_0D_t^{-\nu}\aleph(\varphi) \tag{29}$$

and its solution is

$$\aleph(\varphi) = \aleph_0 \sum_{n=0}^{\infty} \frac{(a_1)_n(a_2)_{\zeta n}}{(b_1)_{\zeta n}} \sum_{k=0}^{\infty}(-1)^k(d)^{k\nu} \frac{\varphi^{k\nu+n}}{(k\nu+n)!} \tag{30}$$

(ii) On setting $\zeta = 1$ in (20), we get

$$\aleph(t) - \aleph_0 \, {}_2F_1(\varphi) = -d^\nu \, {}_0D_t^{-\nu}\aleph(\varphi) \tag{31}$$

whose solution is

$$\aleph(\varphi) = \aleph_0 \sum_{n=0}^{\infty} \frac{(a_1)_n(a_2)_n}{(b_1)_n} \sum_{k=0}^{\infty}(-1)^k(d)^{k\nu} \frac{\varphi^{k\nu+n}}{(k\nu+n)!} \tag{32}$$

(iii) If we take $r=2, q=1$ then equation (25) reduces to

$$\aleph(\varphi) - \aleph_0 \{{}_2F_1^\zeta(\varphi)\}' = -d^\nu \, {}_0D_t^{-\nu}\aleph(\varphi) \tag{33}$$

and its soluion is:

$$\aleph(t) = \aleph_0 \left[\frac{(a_1)_1(a_2)\zeta}{(b_1)_\zeta}\right] \sum_{n=0}^{\infty} \frac{(a_1+1,p)_n(a_2+\zeta)n}{(b_1+\zeta)_{\zeta n}} t^n \sum_{k=0}^{\infty} \frac{(-1)^k(d\varphi)^{k\nu}}{(k\nu+n)!} \tag{34}$$

(iv) On setting $\zeta = 1$ in (25) we get

$$\aleph(\varphi) - \aleph_0 \{{}_2F_1(\varphi)\}' = -d^\nu \, {}_0D_t^{-\nu}\aleph(\varphi) \tag{35}$$
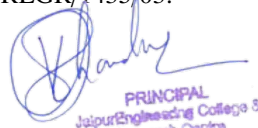
whose solution is

$$\aleph(\varphi) = \aleph_0 \left[\frac{(a_1)(a_2)}{(b_1)}\right] \sum_{n=0}^{\infty} \frac{(a_1+1)_n(a_2+1)n}{(b_1+1)_n} \sum_{k=0}^{\infty} \frac{(-1)^k(d\varphi)^{k\nu}}{(k\nu+n)!} \tag{36}$$

Conclusion

In view of the effectiveness and a great importance of fractional kinetic equation in various field of applied sciences and engineering as well, a significant amount of research in this area has been carried out so far. The two theorems established in the present paper contain solution to a generalized form of fractional kinetic equations involving ζ-Gauss Hypergeometric functions and its derivatives by application of P_χ-Transform. On account of being general in nature, our main findings under suitable parametric constraints, yield numerous known and new results in term of simple functions which may prove to be very useful in applications to various fields of science and technology.
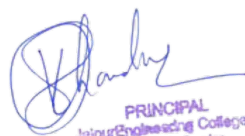
Acknowledgments

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Octagonal patch antenna for WiMax Applications

Vinita Mathur, Parul Tyagi, Neha Singh

Abstract— In this manuscript microstrip feed patch antenna is designed for S band applications. The structure is suitable from 2.2 to 4GHz. The octagonal shape is taken and squares are added that makes it a wing like structure. The proposed antenna is designed on FR4 substrate board of dimensions 50x55x1 mm³ All the simulations are performed using CST Microwave Studio. The current distribution and radiation patterns of proposed model are also presented in this paper.

Index Terms— octagonal patch, S-band, square patch, CST Microwave Studio.

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1 INTRODUCTION

Microstrip patch antennas are most frequently used in wireless communication systems due to their benefits in terms of low manufacturing cost, light weight, compact size and easily integrated to microwave circuits. Patch antennas have capability to work in dual and multiple frequency bands. Present scenerio of wireless communication system required compact and multiple band antenna design. Since much system are operating at multiple frequency range, requiring dual and triple band antenna for various applications such as WLAN, WiMAX, RFID, satellite communication, etc. Presently, many printed monopole antenna are proposed. Serve for wireless applications to cover the wireless standards for Wireless local area network (WLAN: 2.4–2.48, 5.15–5.35, and 5.75–5.825GHz) and worldwide interoperability for microwave access (WiMAX: 3.4– 3.69 GHz) are two among the available wireless standards which allow interconnections of devices for communication [1].

However, the major drawback of this type of antenna is narrow bandwidth. To overcome this problem several techniques are proposed, such as increasing thickness of the substrate, introducing parasitic elements, defected ground structures, introducing slots and modifying the shape of patches [1-3]. Few of the antenna are introduced by implementing various shape of strips and slots for wireless communications. Many other antennas are proposed with the compact size or simple [4-6].

However, reducing antenna height gives rise to a decrease in bandwidth and this effect is independent of the technology used. In fact, the narrow bandwidth characteristic of microstrip antennas cannot meet the continuously increasing bandwidth demand of most modern multiband systems [7-10].

2 ANTENNA DESIGN

The proposed antenna geometry is compact and simple. The proposed patch antenna is microstrip fed as shown in Fig. 1. This antenna consists of octagonal patch with rectangles added which give it a wing like structure. The antenna is designed on FR-4 substrate (relative dielectric constant 4.4). With the dimension of 55X50X1 mm³. Dimensions of the proposed patch are shown in

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- *Parul Tyagi, Neha Singh is currently assistant professor in Electronics and Communication Engineering department at JECRC, Jaipur, India.*

Table 1.

Table 1 Dimensions of patch

L	W	W₃	L₂	r	ε
55	50	2	31	8	4.4

Fig. 1 Proposed Patch

3 RESULTS AND DISCUSSION

Various types of printed monopole antennas are considered for wireless applications, such as square, circular, elliptical, pentagonal, hexagonal, octagonal etc. Out of these octagonal shaped monopole antennas are considered here for designing and analysis.

The change in S11 with effect in the height of the substrate is shown in Fig. 2. Substrate is important for the mechanical strength of the antenna. It is used for degraded electric properties as the surface wave formed on the dielectric extract a portion of total power for space waves. From Figure it is analyzed that better results are observed at h2 = 1 mm. Therefore the substrate thickness taken is h2 = 1 mm.
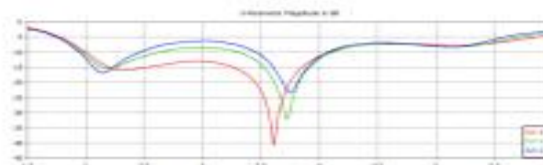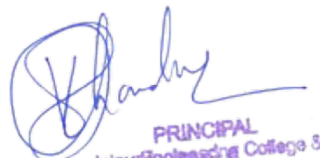

Fig. 2 Comparison of variation of S_{11} with frequency of patch antenna for different substrate thickness

A Survey on Evolution of Internet of Things

Neha Singh, Parul Tyagi, Vinita Mathur

Abstract— In the recent era of advanced technology, everyone is coming across many new paradigms of technology. IoT is one of the most talked-about among them in the industry. Internet of Things is attracting the lifestyle and is becoming the most growing technology. IoT is one of the characters of a "universal global neural network" whose prime concern is to associate with numerous things. The IoT consists of smart machines that communicate with other instruments and the Radio Frequency Identification (RFID) and sensor network technologies will accelerate to match and overcome the new confrontations. This research article comprises of the meaning of IoT, characteristics, and applications. The main objective of this paper is to provide an overview of the evolution and the management of the Internet of Things (IoT).

Index Terms— Internet of things, Smart devices, Radio frequency identification, Architecture, web services

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1 INTRODUCTION

In early times to handle machines and other automation, simple manual methods were used. Although with the change in time and new technologies advanced methods came into existence to control mechanization. With the increase in the availability of computers and the internet a huge amount of data can be accessed. In recent times with the touch of a button, everyone wants an economical and protected method to manage the machines with the Internet.
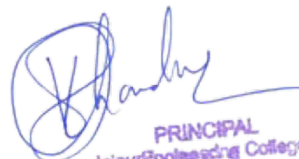
The abbreviation IoT is one of the most commonly used technology in the field of education and industrialization. Generically it epitomizes the scope of network appliances to sense and regularly gather data from numerous sources around the globe and then transmit and receive information over the internet [1]. The information that has been shared is then further revised and being used for other effective objectives. The IoT is a catalog of smart machines interacting with more smart automation, gadgets, environments, and framework as shown in figure 1.
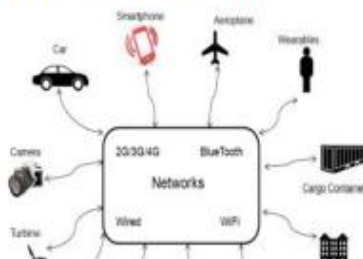
The advancement in the internet of things (IoT) permits various articles loke sensor nodes, embedded systems, and intermediate devices to gather and interchange the information to accomplish the objectives of the entire connected world, in the upcoming future as shown in figure 2. Commonly, the architecture of an IoT architecture comprised of different sensor and RFID nodes to form large-scale distributed embedded systems for various applications based on real-time like smart health-care [2], [3], intelligent transportation systems [4], and smart energy systems [5]–[7].

Fig. 2 Internet of Things

A Study on the Behaviour of MANET: Along with Challenges, Applications and Security Attacks

Parul Tyagi, Vinita Mathur, Neha Singh

Abstract— Mobile ad-hoc network (MANET) is a self-configuring, infrastructure less network of mobile devices connected by wireless (as shown in fig.1) Ad hoc is latin and it means "for this purpose". Every gadget in a MANET is allowed to move autonomously toward any path and will along these lines be a router, the essential test in building a MANET is preparing every gadget to consistently withstand the data required to legitimately course activity. In this paper we concentrated on the exploration challenges and assess open issues being developed of directing procedures in MANETs. Because of versatility and specially appointed nature, security in versatile important systems is especially difficult to accomplish. In MANETs correspondence between hubs is finished through the remote medium. We break down security objectives of MANET's and will depict the exploration challenges evaluate open issues in development of routing techniques in MANET's.

Index Terms — QoS, MANET's, EMI, OSI, IP, TTL, attacks..
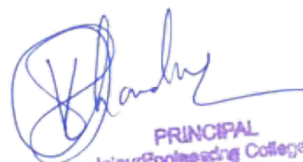
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1 INTRODUCTION

Remote correspondence has turned into an ever-display part of present day life, from worldwide cell phone frameworks to neighborhood and even individual territory systems. Remote broadcast communications systems are for the most part executed also, regulated utilizing radio correspondence. This usage happens at the physical level (layer) of the OSI demonstrates arrange association. Portable specially appointed systems (MANETs) comprise of a gathering of remote portable hubs which progressively trade information among themselves without the dependence on a settled base station or a wired spine organize With late execution advancements in PC and remote correspondences advances, propelled portable remote figuring is required to see progressively predominant utilize and application, a lot of which will include the utilization of the Internet Protocol (IP) suite. The vision of versatile specially appointed systems administration is to support hearty furthermore, proficient task in portable remote systems by coordinating steering usefulness into versatile hubs. Such systems are proposed to have dynamic, once in a while quickly evolving, arbitrary, multi-jump topologies which are likely stately of moderately data transmission obliged remote connections. Because of the con-

Fig. 1. Mobile Ad hoc Network

Inside the Internet people group, steering support for portable hosts is by and by being enunciated as "versatile IP" innovation. This is an innovation to help versatile host "wandering", where a meandering host might be associated through various intends to the Internet other than its understood settled address area space [2].

This is an innovation to help versatile host "wandering", where

Novel Vedic Multiplication Technique and its Implementation – A Fast and Simple Method of Convolution

R. Bathija, Devesh Gupta, I. Suwalka

Abstract— Urdhya Triyakbhyam a new method of convolution based on Vedic Mathematics has been explained for digital signal processing. It has been shown that the convolution of large sequence can be found out in comparatively short time, by this method. We have demonstrated the capability of the method on eight samples. We had used Tanner tool for simulation and 16nm CMOS technology. A delay 53.21ns and power dissipation is 14.91uW has been found.

Index Terms— — Urdhya Triyakbhyam, Vedic Mathematics, CMOS technology, power dissipation, Convolution, Delay,VLSI implementation.

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1 INTRODUCTION

With the latest advancement of VLSI technology the demand for portable and embedded digital signal processing (DSP) systems has increased considerably. Using programmable devices for DSP applications could narrow the gap between the flexibility of general purpose processor (GPP), programmable DSP (PDSP). FPGAs are being increasingly used for variety of computationally intensive applications. In digital signal processing convolution is a fundamental computation that is ubiquitous in many application areas [1].

Convolution is the most important and fundamental concept in signal processing and analysis. Many researchers have been trying to improve performance parameters of convolution system[ ]. One of the factors in performance evaluation of any system is speed. The core computing process in convolution is always a multiplication routine. Faster addition and multiplication are of extreme importance in DSP. Therefore, engineers are constantly looking for boosting performance parameters of it using new algorithms and hardware. After comparative study of different multipliers, Urdhva Tiryagbhyam sutra based on ancient Indian wisdom book – the Vedas, is shown to be an efficient multiplication algorithm [2][3].

2. Background: In Ref.[1],convolution is carried out by serial processing. They used only one 4×4 bit Vedic multiplier based on Urdhva Tiryagbhyam sutra. Though hardware is less, delay is more as sixteen multiplications are carried out one by one using only single multiplier. Direct method for calculating the linear convolution sum of two finite length sequences is easy to learn and perform. The approach is easy to

generate Verilog code for the hardware implementation of this algorithm [5]. But in automatically generated code there is no control on architecture level.

ROM look up tables can be used to implement the computational modules. Multipliers can be realized using memory based approach. Multiplication of two n bit input variables can be performed by ROM table of size 2 with power 2n entries [7]. But this approach is not efficient in area point of view.CRT algorithm minimizes multiplication operation at cost of increase in addition operations [8]. Parallel implementation improves speed [9]. The sutras in Vedic mathematics are easy to understand, easy to apply and easy to remember. Vedic maths is helpful to software developers as it is more scientific than the normal system of mathematics [10].

3. Convolution: Discrete time convolution can be defined as
$$y[n] = \sum_{k=-\infty}^{\infty} x[k]h[n-k]$$
Where x[n] is the input and h[n] is the impulse response. Thus the output of the LTI system is given by a weighted sum of time shifted impulse responses. It is known as convolution sum and represented as *. Thus
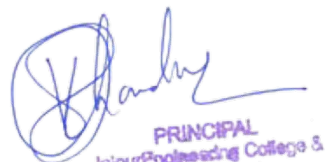$$x[n] * h[n] = \sum_{k=-\infty}^{\infty} x[k]h[n-k]$$
For example if
then convolution sum will be calculated as

For example $x[n] = \{10,20,30,40\}$ & $h[n] = \{2,3,5,6\}$
Then

A Review on ground use & ground Cover in India

Devesh Gupta, Dinesh Sethi, Rajesh kumar Bathija

Abstract: Information on land use/land cover in the form of maps and statistical data is very vital for spatial planning, management and utilization of land. Land-Use and Land-Cover (LULC) scenario in India has undergone a radical change since the onset of economic revolution in early 1990s. These changes involve a series of complex interaction between biophysical and socioeconomic variables. LULC follows a set of scientific themes which includes detection and monitoring, carbon and biogeochemical cycle, ecosystems and biodiversity, water and energy cycle, predictive land use modeling and climate variability and change. With the changing times and increasing demand on the availability of information on land use/land cover, it becomes necessary to have a standard classification system, precise definition of land use/land cover and its categories, uniform procedures of data collection and mapping on different scales over Indian region. The current review thus attempts to focus on development of a national goal towards changes in LULC as a necessary step for an interdisciplinary research program involving climate, ecological and socioeconomic drives, the processes of change and the responses and consequences of change.

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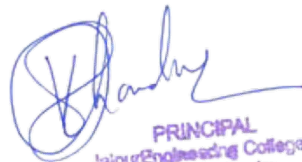## 1 INTRODUCTION

India is bestowed with valuable natural resources serving the needs of sustenance of around a billion population and varied ecological functions. Since independence the population has increased by 284% (363 to 1033 Million) and food grain production by 386% (51 to 196 Million Ton). The country has 150 Million ha of agricultural area and about 24% GDP is met from the agricultural production. The loss of forest cover in India for the period between 1990 and 2000 is 380.89 km², annually (FAO, 2000). The forests are integrated with social system for their dependence for fuel wood, fodder, minor economic production etc. Today, with the growing population pressure, low man-land ratio and increasing land degradation, the need for optimum utilization of land assumes much greater relevance.

National Land Use Policy and strategy on Optimum Land Use Planning and the creation of National Land Use Conservation Board (NLUCB) in 1985 clearly indicate the serious concern of the Government in this regard. Further, with the present thrust that the agricultural planning in the country should be based on agro-

A Study on Carbon Nano-Tube Field Effect Transistor (CNTFETs): A Promising Technology for future ICs
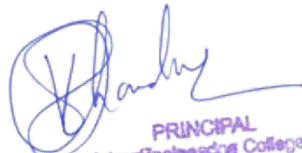
Ritambhara, Yazusha Sharma, Nishi Agarwal, Sandeep Vyas

Abstract—Presently, the low power and high efficiency are imperishable problem in technological gadgets. With the emergence of technologies like 5G and others, it has become requisite to meet the challenge before peeved. In this paper we entrust FinFETs, and CNTFETs technologies which are found to be upbeat field of research. The paper presents the performance enhancements of CNTFETs at 14 nm node and discusses the important areas of their applications and future scope.

Index Terms— CMOS, FinFETs, CNTFTs, Simulation, Permittivity, Device Modeling, Device Scalability, MOSFET, Scaling.

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1 INTRODUCTION

As Gordon Moore predicted, over the last three decades number of transistors in a single chip has been increased from thousand to several billion and suggested it doubles every year [1]. International Technology Roadmap for semiconductor in 2015 predicted and stated that in next five years CMOS technology will stop shrinking because industry will not able to scale CMOS resulting to death impart to Moore's law [2]. Si-MOSFET based technology has its own limitations like high power density, high leakage current, and decreased gate control resulting them to be inappropriate for ultra–high speed and low power applications. The limitations forced scientists and research to explore other alternatives. FinFETs and CNTFETs has emerged

Field Effect Transistor (MOSFET) enabled to develop advanced systems like day to day required gadgets like Smart Phones, Laptops, etc., which is prior to the 22 nm node. With 22 nm node technology, further scaling down of MOSFET is not possible due to increased Short Channel Effects (SCE) such as Drain Induced Barrier lowering (DIBL), Impact Ionization, velocity saturation, Channel length modulation, so most of the foundries introduced new type of transistor called Fin Field Effect Transistor (FinFETs), which has less SCE's, and better control over the channel; this transistor structure is being used in 16 and 14 nm node also. The FinFETs based 14 nm node technology portrays some serious issues, which leads to the degraded performance

Silver and Gold Coated Plasmonics Based Optical Fiber Sensors: A Review

Yazusha Sharma, Ritambhara, Ritu Vyas, Sandeep Vyas

Abstract: This survey focuses on the most valuable contribution in the field of fibre optic plasmonic sensors recent years. Fibre optic plasmonic (FOP) sensor use optical field to test the biological agents. Due to high sensitivity, high figure of merit and high resolution and low cost, FOPs turn out to be potential alternatives to conventional biological fibre optic sensors. The work is focussed on review of type of plasmonics based optical fibre. The important characteristics of plasmonic based FOPs are discussed in this article. The different types of structures fibre sensors like single mode fibre, multimode fibre, microstructure fibre. The different structures, their performance parameters and experimental results related to some important works have been discussed here. Based on the present view, the future scope, its different applications and related aspects have been discussed. SPR fiber sensors can have variety of structures such as D-shape, cladding-off, fiber tip or tapered fiber structures. Major applications of these include chemical sensors, bios sensors and gas-sensors. The surface plasmon resonance (SPR) property of metallic nano-particles is widely useful for chemical and biological sensing. Selective bio-sensing of molecules using these nano-particles has become a major research interested area between chemistry, biology and material science. Noble metals, especially gold (Au) and silver (Ag) nano-particles, exhibit unique and tunable plasmonic properties; the control over these metal nanostructures size and shape allows manipulating their LSPR and their response to the local environment. In this review, we will focus on Ag-based nano-particles, a metal that has probably played the most important role in the development of the latest plasmonic applications, owing to its unique properties. These nano-structured fiber sensors have attracted considerable research and development interest, because of their unique advantages and unique properties, which include high sensitivity, small sensor head footprint and the flexibility of the optical fibers. They are also of academic interest, and many novel ideas are continuously developed.
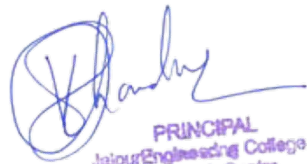
Keywords- SPR, FOP (Fibre optic plasmonic sensor), FBG,LPG, PCF, SP, LSP, MMF(Multi-mode fibre), Plasmonics, LSPR

1 INTRODUCTION

The present trends, the surface Plasmon resonance (SPR) based biosensors have attached much attention due to its rapid real time sensing performance [1, 3, 5]. There are lots of application of SPR sensors in different field of practical life like medical diagnostic, gas detection, organic chemical sensing, water testing, maintain food quality, bio-sensing ,bio-imaging, environment monitoring, glucose monitoring, diseases detection, real time monitoring and so on. The researchers have been developing many effective applications based on SPR sensors, terahertz sensors, and optical sensors for the improvement of current technology. Ritchie et. Al in 1950's first observed about SPR theoretically [4-6]. On the basis of prism coupling, Lied berg et. Al in 1983first, introduced about SPR. Usually, the prism is used to activate surface Plasmon's [6-7]. Prism is used to pass the light to the metal surface interface whereas transverse magnetic or p-polarized light is induced in the metal surface and the free electrons of the metal absorb the light and generate surface Plasmon's wave (SPW)[7-10]. But there are some limitations to used prism based SPR sensing devices such as; it provides a bulky size devices with various kinds of optical and mechanical parts [9, 10]. So it is not suitable for remote sensing applications [10, 12].

In a fiber optic SPR sensor probe, a small portion of cladding is removed in optical fibre and the unclad portion is coated with a thin metal layer [14, 21, 24]. The characteristics of SPR optical fiber sensor are admirable sensitivity to the refractive indices of the surrounded dielectric medium. Thus with the PCF based sensor, one can have the miniaturization of the device, compatibility and portal, rapid and multi–sample testing with sensing performance etc.[15-17]. This optical sensing is known as phase-matching which can be easily achieved in the PCF based SPR sensor by engineering the effective refractive index of the core guided mode and the plasmonic mode. Recently, great interests in engineering the geometrical and material properties of the PCF-SPR sensors are numerically investigated with different biological samples to monitor the medical conditioning. PCF has gained its importance because it has different appealing characteristics e.g. controllable bire fringes, high confinement and single mode

Quad-band Frequency Reconfigurable Microstrip Patch Antenna Using Modified Ground Plane for the WI-FI, Wi-Max, RF-Altimeters, and WLAN Applications

Jaiverdhan[1], Ashish Kumar[2], Girraj Sharma[3], Sandeep Vyas[4]

Abstract — In this paper a novel design of frequency reconfigurable microstrip patch antenna is presented. The antenna consists of a square patch with modified ground structure having four PIN diodes and a DC blocking capacitor. This modified ground structure reduces overall size of antenna. By miniaturization of antenna it is able to operate at lower frequency. The antenna provides stable radiation at 2.61 -2.68 GHz (BW=2.7%) (Wi-Fi), 3.37-3.63 GHz (BW=7.71%) (Wi-MAX) and 4.14-4.65 GHz (BW=12.31%) (RF-altimeters), 5.24-5.64GHz (BW=7.63%) (WLAN). In the proposed method feeding is done by microstrip feed line of 50-ohm impedance. Overall dimension of proposed antenna is 20 X 20 mm² .The results are simulated using CST Microwave studio V. 2017. In proposed paper we computed different parameters like S₁₁, VSWR, Surface current and Gain Plot which are significant for different wireless applications.

Index Terms—Microstrip antenna, reconfigurable, PIN diode, DC blocking capacitor; WiFi, WiMax, WLAN, RF-Altimeters.

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1 INTRODUCTION

RECONFIGURABLE microstrip patch antennas has caught great attention in recent years and because of different kinds of gadgets in our everyday life and increases the use of reconfigurable antennas [1]. These antennas have several merits as compared to the conventional antennas. In such types of antenna, we can use single radiating element for different applications thus reducing the system complexity. The reconfigurable patch antenna has the capability to switch in between various standards, it also has the advantage of reducing the noise and increasing the gain of system. It also saves the energy of the system[2].
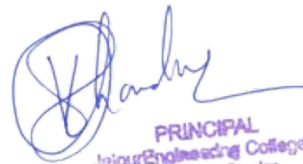
Reconfigurable antennas can be classified as:

- Electrical Reconfigurable antennas: In these antennas switching is done with the help of switches such as PIN diodes, varactor diodes, RF-MEMs, etc.

- Optical Reconfigurable antenna: In these the optically operated switches are used.

The patch can be fed by several techniques such as coaxial probe feeding, microstrip feeding, proximity coupling and aperture feeding technique.

The main advantage of the transmission line feeding is that the impedance of the line can be easily changed by varying the width of the line. Also it can be made as a part of the planar fabrication technique [3].

While using the same radiating element for varous applications having different operating bands, there must be sufficient isolation in between the adjacent band to avoid any interference. These features can be easily achieved by using the reconfigurable antennas.

Several research is carried out in case of multiband antennas. To obtain the multiband behavior for a particular antenna several techniques have been devised which includes the use of multiple radiation sections, cutting slots on the radiating element or the ground, etc.[4].

Review: the Human Pose Estimation using Radio Frequency

Atul Kumar, Diya Patel, Arundhati Sharma, Baibhav Ranjan, Sandeep Vyas

Abstract— Machine learning and artificial intelligence(AI) has made a lot of advancement in the technologies available. These modifications in the technology have led many researchers of Computer Science and Artificial Intelligence (AI) Laboratory(CSAIL) at Maassachusetts institute of technology to develop an idea which provides a technique that is able to construct a human-like stick figure of a person standing behind a wall. They examined and evaluated the plan of RF-Capture and tools which could analyze data generated through radio signals. Using computer vision as a technique to build a mechanism that is capable of seeing through walls is like achieving a great milestone in this field. The accurate human pose can be estimated even through occlusions and walls using computer vision that was never possible before. Even the results of the experiment were unexpected. It performed beyond what the scientists thought. Moreover, it is not required to provide visual data to model to predict posture, hence there is no need of attaching a device.

Index Terms— Machine learning, Artificial intelligence, Human pose estimation.

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1 INTRODUCTION

Localizing and tracking the motion of the people in the past years has been at boom due to security and medical reasons using wireless signals. This is now possible using the newly developed neural network model RF-Pose. RF-Pose uses AI technique and tools to sense people's movements through walls. The project senses change in radio frequencies when a human comes into view, and uses an AI trained with both images of humans in certain poses and the corresponding reflected radio frequencies from their bodies to tell what someone is doing. While normal humans can't spot through walls, the AI system was designed using images and RF changes with no visible barrier but was then able to pick out people's poses when a wall was placed between them and the system [1].

The image seen in figure 1 illustrates this ability quite well, where stick-legs are generated on a human whose torso is visible through a window.

To capture a human figure whether occluded or from behind a wall RF-pose first emits wireless signals that can penetrate wall but not a human body. These signals that bounce back from the human's body are analyzed by the neural network and are used to reconstruct the stick figure. Moreover, it does not require the person to attach any sensor to the body or to wear any device.

The applications are as follows [2]:

- It can detect a person through occlusions and walls.
- It can determine a person's movement from behind a wall.
- It can even trace handwriting of a person in air through walls.

The neural network incorporated is used to guide wireless devices to observe posture and action of people even from the other side of the wall. The power of the transmitted signal is 10000 times weaker as compared to a standard cell-phone. These are the radio signals that reflect back after striking human's bodies. Hence these signals are used to create a dynamic stick figure and heat map as shown in figure 2, which moves its body exactly how a person moves [3].
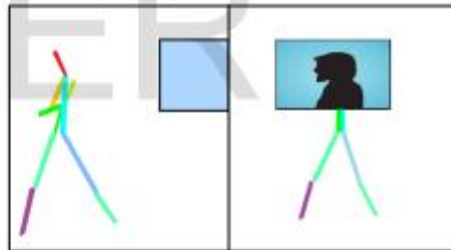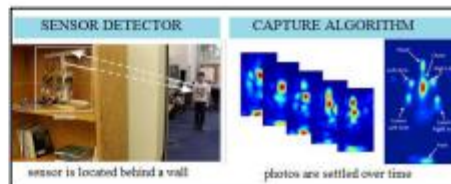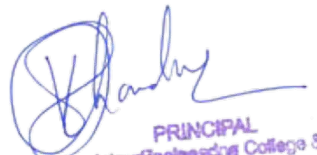

Fig. 1 Stick figure obtained from the neural model.

Steganography: An Introduction and various techniques in Digital Image Processing

Vikas Sharma, Manish Yadav, Ashish Kulshrestha

Abstract: Steganography is the process of image data hiding in a way that nobody other than sender and known recipient know that communication is on progress. It is also worked in authenticate the digital images. The steganography is classified in spatial domain and frequency domain methods. This research paper presents cryptography based methods to authenticate the images and can be used to protect image fraud. In steganography it has been worked around for decades, the digital revolution has enlightened and renewed area interest in this domain. This paper, focused specifically in the techniques used in protecting information in digital images.

Keywords: Authentication, Least signed bit, encryption, secret message, steganography, security.

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I. INTRODUCTION

Steganography word came from the Greek word which means covered hand writing and primarily means "to hide the plain sight". As stated by Mr. Cachin [2] steganography is the science of communicating in a such different manner that the presence of message cannot be detected and found. Basic stego techniques have been in existence for centuries, but the increasing and very vast use of images and files in digital media few new techniques for information protection have become most required. This research paper examines few early methods of Steganographic process general principles behind its usage. Then we will examine, why it has became an important issue in recent time frame. There will be a brief discussion of some specific domain techniques for covering information in many other formats and the attackers which might be used to by pass steganography techniques. Here, figure 1 shows that how information data hiding could break down in different areas. The Steganography may be used to hide a data message intended for post retrieval by an individual or a group of users. In this case the basic primary aim is to protect the message being tracked by third party. So, another major field of steganography is copyright marking, where an input message used to insert copyright over a document.
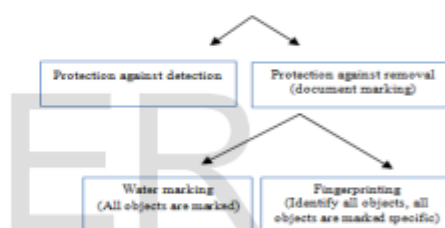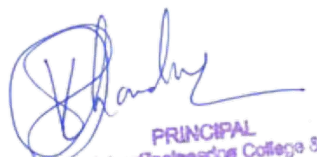

Figure.1. Classification of steganography

Encryption and steganography are the both used to ensure the data security. However the main difference is that encryption user can see both parties are transmitting and receiving in secret manner but not in stegnography. The steganography method covers the presence of a secret message, in best case users can't see both parties are communicating in a defending way. This builds steganography is best suitable between both. And adding the encrypted copyright message and information of an digital image file can be easy to extract but embedding within contents of the digital file so itself could protect being easily identified and also removed. Table 1 puts a detailed comparison of many techniques for setting a communication in secret. The Encryption methods in which secure communication needs a right key to read the encrypted information. A cyber information attacker couldn't fetch encryption but it is comparatively easy to c modify the digital

Design and Simulation of Tapped Input Compact Hairpin Band Pass Filter

Girraj Sharma, Ashish Kumar, Jaiverdhan, Ashish Sharma, Jitendra Sharma

Abstract—In this paper design and simulation of a tapped input microwave hairpin filter has been presented. The filter is designed for center frequency of 2.8 GHz. The proposed filter has a bandwidth of 390 MHz. It is found that the filter is giving return loss of -25dB. The 2.8 GHz frequency is covered by microwave S-band which have applications in surveillance radar, surface radar, and satellite communication. The proposed filter is suitable for radar applications due to its compactness. The filter is of 12 X 20mm size and works in a single band mode. The design steps are given to determine the filter dimensions.

Index Terms— Microstrip line, bandpass filter, Hairpin filter, S-band application, Microwave filter, Distributed system

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1. INTRODUCTION

Band pass filters are necessary part of any Communication and signal processing system. It is also an essential part of superhetrodyne receivers which are presently used in many radio frequency communication applications. The discrete components are exchanged by transmission lines at microwave frequencies [1]. The microstrip finds its role in low power applications. The proposed Paper describes the designing of a microwave band pass filter using microstrips. There are many techniques by which a microstrip filter can be designed. In this paper a fifth order chebyshev hairpin bandpass filter is designed.

2. DESIGN METHODOLOGY

Hairpin filter are one of the most commonly used filter in many microwave applications. The concept of hairpin filter designing is based on parallel coupled half wavelength resonator filters [2]. The major advantage of hairpin filter is its low space employment compared to parallel coupled and end coupled microstrip filters. In hairpin structure, the half wavelength long resonators are folded in U-shape hence the overall space is saved. This design is simpler than other microwave filters.

The mutual coupling coefficient is Mi, i+1, between two resonators and Qei and Qeo are the quality ³factor at the input and output respectively. These are the design parameters for the hairpin filter and can be determined as
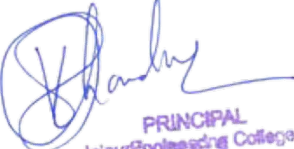
$$Q_{en} = \frac{g_n g_{n+1}}{FBW} \tag{2}$$

$$M_{i,i+1} = \frac{FBW}{\sqrt{g_i g_{i+1}}} \tag{3}$$

The proposed filter is designed for a fractional bandwidth equals to 20% or FBW = 0.2 at a center frequency f_0 = 2.8 GHz. For this filter a three pole Chebyshev lowpass prototype is chosen. The passband ripple of 0.5 dB is selected. For a given normalized lowpass cutoff frequency, the low pass prototype parameters are determined using table 1.

In the next step of the filter design, dimensions of coupled microstrip lines are determined. These lines show the desired odd and even mode impedances. In the first step microstrip shape ratios (w/d) is determined. The shape ratio relates the coupled line ratios to the single line ratios.

Figure 1: tapped line input 5-pole Hairpin Filter

Time Frequency localized Improved S-transform for EEG Signal Analysis

Ashish Sharma, Rahul kumar Vijay, Girraj Sharma, Ashish Kumar

Abstract Many signals in nature are non-stationary and their attributes vary with time. Time-frequency analysis is the approach used to detect the time-varying behavior of the signal. Due to the change in the frequency with time, Fourier based approaches does not provides useful results. In this paper, we applied the stockwell transform (ST) based approach for time-frequency decomposition on Electrocardiograph (ECG) signal. The S-transssfrom based approach detects the condition on which frequecy of ECG signal changes for the detection of the driving Fatigue condition. The results show that the S transform can detect the various stages of drivers fatigue condition efficiently which can helps to prevent the accidents on roads.

Index Term EEG, time-frequency analysis, S-transform, driving fatigue.

I. INTRODUCTION

EEG (Electroencephalogram) signal[1] is the electrical changes of the mind, which is recorded by joining cathodes to the scalp. The mind is a tremendously complex structure and contains various data related to the human soul and natural structures. Along these lines, numerous scientists from sorts of fields constantly separate and break down the understood data of EEG by a wide range of signal processing techniques. Here, the fundamental strategies in EEG examination are time-frequency analysis. Time-frequency analysis is a useful method by which one-dimensional signal can be transformed two-dimensional signal. When we apply it on any time series data, not only it reveals the frequency distribution but also the time duration of every component[2-7]. Various time-frequency methods to analyze the EEG Data are Short-Time Fourier Transform (STFT), Wavelet Transform (WT), Gabor Transform, Wigner-Ville Distribution (WVD), Hilbert-Huang Transform (HHT) and so on. S-transform is developed based on the Short Time Fourier Transform(STFT) and Continous Wavelet Transform(CWT). The S-transform, time-frequency representation of a time series. It uniquely combines frequency-dependent resolution that simultaneously localizes the real and imaginary spectra. The basis functions for the S-transform are Gaussian modulated cosinusoids so that it is possible to use intuitive notions of cosinusoidal frequencies in interpreting and exploiting the resulting time-frequency spectrum. With the advantage of fast lossless invertibility from time, to time-frequency, and back to the time domain, the usage of

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the S-transform is very analogous to the Fourier transform. In the case of nonstationary disturbances with noisy data, the S-transform provides patterns that closely resemble the disturbance type and, thus, requires a simple classification procedure. Further, the S-transform can be derived from the continuous wavelet transform (CWT) choosing a specific mother wavelet and multiplying a phase correction factor. Thus, the S-transform can be interpreted as a phase-corrected continuous wavelet transform. It has been successfully used in electrical engineering [8], geological engineering [9], noise filtering [10] and other fields.
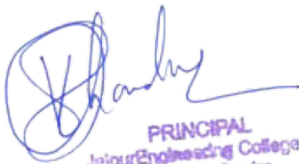
II. THE S-TRANSFORM

A. Introduction

In recent years, Time-Frequency analysis of the non-stationary signal is one of the most concerned topics of research in seismic signals processing. It is the capable technique for investigation of the non-stationary signals. It provides the jointly distributed information between time domain and frequency domain, which provides knowledge about the time instants where frequency changes along with time. Such as the Short-Time Fourier Transform (STFT), Wavelet Transform (WT). Both transform algorithm is easy and also free from the interference of crossover terms. The only limitation is the Heisenberg uncertainty principle; that is why peak time-frequency resolution is not achieved. In STFT resolution is destitute due to fixed window length. While basis functions are used in Wavelet Transform (WT), which expands and contracts with frequency.

III. THE STOCKWELL ANALYSIS

let consider a signal h(t); The Stockwell[11] change is

A Review on Doped and Deffected Graphene-based materials for supercapacitor electrodes

Yogita Taluja, Devesh gupta, Deepak shankhla, Bhoopesh kumar Kumawat

Abstract— The graphene supercapacitor having brilliant surface area about $26.3*10^4 cm2/g[5]$, still it is unable to attain the essential energy density due to small quantum capacitance and poor accessibility to electrolyte. The functionalization of graphene can grow electrolyte wettability, electrical conductivity, electrode accessibility and capacitance [1,2]. Especially, Reasons for given preference to nitrogen doped graphene are it has favorable energy density , electrical conductivity, power density catalysis absorption and life cycle[3-4]. In this study, we see structural, the quantum capacitance, electronic properties of defected and nitrogen doped graphene sheet using Density Functional Theory (DFT) and non-equilibrium Green's function (NEGF) formalism for their practicable application as supercapacitor electrodes.
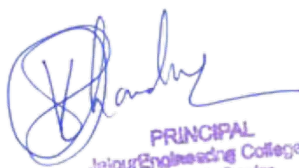
The 3N-Pyrrolic -type defect configuration having formalized high thermodynamic stability along with the electrical conductance in analogy to all the other configurations. The quantum capacitance of graphene surge with the pyrrolic concentration. A notable $486.32 uF/cm2$ quantum capacitance has been remarked at a pyrrolic concentration of 6.38%[4,5]. It suggests that the quantum capacitance of graphene grow with the pyrrolic concentration.

Index Terms—Graphene-based materials, Defect, DFT, Supercapacitors, Quantum Capacitance, pyrrolic, Functionalization.

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1 INTRODUCTION

The demand for energy storage is on the bloom these days in view of growing energy consumption and declining fossil fuel resources. A previous surge in power generation through intermittent energy sources (wind, water and solar) stipulates the need[1]as we all knew that wind , water and solar is not stable with time. Solar energy can't be produce during night, the wind and tidal powers are dependent on the environment. That's why Growing the attention of the researcher on Supercapacitor. It is such a favorable device having fast charging and discharging represent by its high power density and extremely high life cycle greater than 1000 cycle[6-7]. Problem with the supercapacitor is its comparatively low energy density(5-10 Wh/kg) to conventional conventional storage devices lead-acid battery (20-35 Wh/kg), Li-ion battery (120-170 Wh/kg), LiMH battery (40-100 Wh/kg) [2,4,8,17,18] as, EDLCs Store energy through adsorption of ions at the electrode and electrolyte interface; high surface area by with good electrical conductivity are the necessary requirements to attain high energy densities.

Thus, besides developing the advanced electrolytes, the researchers have also focused on optimizing the electrode material. The graphene-based materials are prosperous for applications in supercapacitors electrode and other energy storage devices because of the intriguing properties, i.e., highly tunable surface area, outstanding electrical conductivity, excellent mechanical behavior and good chemical stability. It has been reported experimentally and theoretically, functionalization of graphene honeycombs can grow electrical conductivity, electrode, capacitance and electrolyte wettability,availability [11,12]. Mainly,Nitrogen doped graphene see as assuring material for electrical conductivity, ifetime, power density, catalysis adsorption and energy storage[13-17,1]. Substitution of nitrogen in pure graphene(pristine) commonly resultant donor states in the electronic structure. Beside that many survey state that the type of conductivity(p-type or n-type) depends on different factor and change by different ways[18-19] . In addition, surface properties of carbon just as surface polarity and electron donor affinity increase through the substitution of nitrogen.[16,1]

Adder Designing Process LUT based Using FPGAs

Deepak Sankhala, Yogita Taluja, Deepak Verma

Abstract — This paper presents a imagination of reconfigurable hardware appliance of the most basic operation of mathematics function addition on FPGA. Now a day field programmable gate arrays (FPGAs) have very huge and manifold logic resources resulting in the migration of their coating domain from image low and medium volume formation designing.   In this work, we use an access to straightly map the design described in a high level package i.e. on FPGA platforms. Therefore, the concept which is using for addition it take major portion in all the digital designs and also many digital concepts are available to perform addition operation. Technology dependent optimizations are carried out to utilize this FPGA primitive efficiently and the result is compared against various adder designs. The fast carry chain propagation is reached by optimizing the use of 6-input LUTs together with the dedicated MUXCY resources available in the Virtex-5 FPGA chip. The state of processing adequate skill of any digital contemplation is determined on the basis of various parameters such as hold, power, space and time. . This paper proposes a fast adder structure for Xilinx Virtex-5 FPGAs In this paper we consider the mapping of arithmetic adders on look-up table (LUT) based FPGAs. Representing fact as they are to assign the given Boolean function into an look at the bright side of things So net list that can implement the desired working with minimum cost. We analysis and focus on 6-input LUTs that are inherent in all the modern day FPGAs.. This paper proposes a fast adder structure for Xilinx Virtex-5 FPGAs. The fast carry chain propagation is reached by optimizing the use of 6-input LUTs together with the dedicated MUXCY resources available in the Virtex-5 FPGA chip. Technology dependent optimizations are carried out to utilize this FPGA primitive efficiently and the result is compared against various arithmetic's operation designs
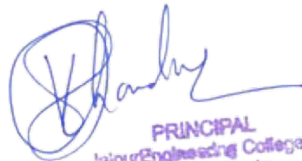
Index Terms TECSA (Time Efficient Carry Select Adder), Virtex, FPGA, MAC , Boolean logic functions, VHDL, multiplexers

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1 INTRODUCTION

So for fast implementation processing and less delay time we explore the possibility of using a field programming logic array. Field Programmable Gate Arrays (FPGAs) combine limited cost and reconfigurability with very high make in to one unit facility and performances. Such characteristics, along with reduced price and make them a valid alternative to the more multifold and time to market demanding Application Specific Integrated Circuits (ASICs)

Sum of digit is the main operation of each arithmetic circuit, thus improving speed performances and reducing the area occupancy of adder circuits is still an initiative research topic . In digital Very Large Scale Integration (VLSI) Circuits,

The various existing adder structures such as Ripple Carry Adder (RCA), Carry Look Ahead Adder (CLA), Carry Save Adder (CSA), Carry Select Adder (CSEL), Carry Bypass adder (CBY) and Area Efficient Carry Select Adder (AECSA) are analyzed based on the performance. Among all structures, some structures reduce the area occupied by the circuit with the increased delay and some structures reduce the delay with the increased consumption of area. The proposed adder structure results in optimized performance, that is, the delay is reduced with the equal consumption of area which was observed in normal adder design.