PROCEEDINGS

NCVPEVM - 2022

NATIONAL CONFERENCE ON

VIRTUALIZATION AND PERFORMANCE EVALUATION OF VIRTUAL MACHINES IN CLOUD

on 28th &29th October 2022

In association with

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Department of Computer Science & Engg.

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GANDHI INSTITUTE FOR EDUCATION & TECHNOLOGY
BHUBANESWAR

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NATIONAL CONFERENCE ON VIRTUALIZATION & PERFORMANCE EVALUATION OF VIRTUAL MACHINES IN CLOUD

on 28th &29th October 2022

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Prof. (Dr.) Sambit Kumar Mishra

Executive Editor

Prof. (Dr.) J. Jena

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Message
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Message from the Chairman

It gives me immense pleasure to know that Department of Computer Science & Engineering, GIET, Baniatangi, Bhubaneswar is organizing a Two days National Conference on " Virtualization & Performance Evaluation of Virtual Machines in Cloud" (NCVPEVM-2022) during October 28-29 ,2022 in association with JECET Journal and Tata Consultancy Services in GIET Campus. A large number of experts, delegates, academicians and students are participating in the Workshop and will deliberate on the topic. Computer Science and Engineering plays a major role in meeting the demands of modern IT infrastructure & IT solution that seeks continuous improvement in performance. There is a growing need from the industries for development of new concepts and approach to meet the challenges in the field of information technology. Keeping in view, this Workshop is being organized to facilitate meaningful interaction among the industries and R&D institutions.

A good number of experts from reputed National Institutes like IIIT, IIT Bhubaneswar and many other Engineering institutions etc. have agreed to deliver keynote addresses, invited talks and chair the Technical sessions during the Conference. It is an excellent platform for all concerned to update their knowledge and share their expertise during the Conference. I do hope that the delegates and participants will be highly benefitted from the deliberations of the Conference.

I wish the Workshop a grand success.

Dr. S.P. Panda
Chairman
GIET, Bhubaneswar

Message from the Vice Chairman

I am very glad to say that the Department of Computer Sc. & Engg., GIET, Baniatangi is organizing a Two days National Conference on " Virtualization & Performance Evaluation of Virtual Machines in Cloud" (NCVPEVM-2022) during October 28 -29, 2022 in our Campus. A large number of experts from reputed institutions, delegates, academicians and students from many Institutes and R&D Organizations are participating in the National Conference and will discuss on the topic. Computer Science & Engineering department plays a major role in meeting the infrastructural demands of modern IT Sector that seeks continuous improvement in performance. Keeping in view, this National Conference is being organized to facilitate meaningful interaction among the Industries and other research Institutions to take the lead in the technological progress of the country.

It is the most appropriate platform for all concerned to update their knowledge and share their expertise during the National Conference and I do hope that the delegates and participants will be highly satisfied with the outcome and would be greatly benefitted from the National Conference.

I wish the National Conference a big success.

Prof. J. P. Mishra
Vice Chairman
GIET, Bhubaneswar

Message from the Principal

Day by day new development in Science and Technology leads to implementation of advance technologies in our life. In this regard the Department of Computer Sc.& Engg. , G.I.E.T., Baniatangi is organizing two days National Conference on " Virtualization & Performance Evaluation of Virtual Machines in Cloud" (NCVPEVM-2022) during October 28 -29, 2022 association with JECET Journal and Tata Consultancy Services on 28th and 29th October 2022. I am sure the deliberations in the workshop will help the participants in understanding the subject and utilize the technology in their teaching and also in research activities.

I take this opportunity to congratulate the team for their best efforts in bringing out these proceedings and wish the publication a grand success.

Prof. (Dr.) Jibanananda Jena
Principal
GIET, Bhubaneswar

Message from the HOD

The Department of Computer Science & Engineering of Gandhi Institute for Education &Technology , Baniatangi, Bhubaneswar, Odisha is organizing two days National Conference on " Virtualization & Performance Evaluation of Virtual Machines in Cloud" (NCVPEVM-2022) during October 28 -29, 2022. The major motivation behind organizing such an event is to encourage young scientists and academicians across the nation to come under one umbrella and to communicate and exchange ideas for sharing and also to enable them to publish the findings in proper forum.

I express my sincere thanks to the authors for their cooperation and contribution. I strongly believe that it would not have been possible had there been no such spontaneous involvement of these scientists and academicians. I express my sincere thanks to the Guests of honor and speakers Prof.(Dr) Padmalochan Bera, IIT, Bhubaneswar , , Prof.(Dr.) Srinivas Prasad, GMRIT, Rajam , Prof. (Dr.)B.D.K.Patra RBS Engg.Technical Campus, Agra , Prof.(Dr.) M Hima Bindu, North Orissa University, Baripada, Dr. Suman Bhattacharya , iON Education, Tata Consultancy Services and Shri Rajeswar Sahu, Senior Cloud Architect , Tata Consultancy Services who kindly agreed to speak on Virtualization & Performance Evaluation of Virtual Machines in cloud. Prof.(Dr.) Rakesh Balabantaray, IIIT, Bhubaneswar has also kindly agreed to be present and deliver the most relevant key note address.

My hearty thanks to our esteemed Chairman Prof. (Dr.) Satya Prakash Panda for giving the encouragement and opportunity to conduct such Workshop in our Institute. Again I extend my hearty thanks to our Vice Chairman Prof. J.P.Mishra for his support to make this National Conference a grand success. I am also thankful to our Director Prof.(Dr.) B. Pradhan, Principal Prof.(Dr.) N Sutar, Dean Prof. (Dr.) Mohan Charan Panda for their valuable suggestions and supports.

A National Conference of this magnitude is not possible without the active participation of large numbers of dedicated members. My sincere thanks to the organizing committee, technical committee and the department of Computer Sc.& Engg. for providing their outstanding support to make the Workshop a grand success. Last but not the least, I am really thankful to all the participants, authors and all those who directly and indirectly helped us to make the Workshop a grand success.

We hope that the delegates have enjoyed the National Conference as much as wonderful and vibrant GIET, Baniatangi campus.

Prof. (Dr.) Sambit Ku. Mishra
Head of the Department
Computer Sc. & Engineering
GIET, Bhubaneswar

ABOUT GIET, BHUBANESWAR

GIET was established at Baniatangi, Bajpur, Khurda by the SPBM foundation, Bhubaneswar in May, 2009 affiliated to Biju Patnaik University of Technology, Rourkela, Odisha. The Postgraduate Centre of GIET is functioning from the year 2013.

In GIET, every effort is harnessed to realize the dream of making this educational institution as temple of learning. It is the aim of GIET to participate in the task of inculcating necessary Knowledge, Skills and Creative Attitudes and Values among the youth of the country to contribute more effectively towards establishing an equitable social and economic and secular ideal of our nation. GIET is well known for its dedicated faculty, staff and the state-of-the art infrastructure conducive to a healthy academic environment. The Institute is constantly striving to achieve higher levels of technical excellence. Evolving a socially relevant and yet internationally acceptable curriculum, implementing innovative and effective teaching methodologies and focusing on the wholesome development of the students are our concerns. The Institute currently has seven academic departments including PG departments in four disciplines of engineering, with nearly more than 50 laboratories organized in a unique pattern of functioning, Central Library with state of the art facilities, Auditorium, Student Activity Centre, Computer Centre, Indoor Games facilities, basket ball & Athletic stadium, Seminar Halls with required infrastructure etc. Faculty of repute, brilliant student community, excellent technical and supporting staff and an effective administration have all contributed to the pre-eminent status of GIET.

GIET, Bhubaneswar is almost a residential institute housed with nearly 1800 students. It has 06 hostels out of which 04 hostels for boys and 02 hostels for girls. Lovely gardens, student amenities, shopping complex, water fountain, play ground facilities etc. in the campus are of immense interest for students. The placement service at the institute is one of the best of its kind for its 1st batch of students. The alumni of the institute hold responsible and enviable positions all over and are in constant touch with the institute. Every new entrant into the portals of this institution is poised for partaking a rich heritage and tradition that is unique to GIET.

Each year, we do conduct Cricket, Football tournaments, besides the annual athletic meet. The students of the Institute also participate in various sports and games competitions elsewhere to represent the Institute. The students run many hobby clubs like Photography club, Music club, Science club, Debate club and Fine Arts club. The competitions on debate, music etc. are organized department wise, hostel wise and Institute as a whole. The Institute organizes its annual cultural festival 'SPARKLE' every year. There are many facilities for the students to engage themselves in extra- curricular activities. Sports and cultural activities have become part and parcel of the campus life.

The institute brings out a Institute Newsletter: "The Campus Focus" every quarter which publishes literary and technical articles, faculty and students achievements, publications, various activities carried out inside the campus and etc.. To motivate the students in social services, the Institute has a unit of CSR team. The students of this unit render social services in the nearby rural areas.

The Institute is well connected by road, rail and air to all national as well as international destinations. The Institute has been awarded as best Technical Institute by leading Organizations for last three years.

DEPARTMENT OF COMPUTER SC & ENGINEERING

The Department of "Computer Science and Engineering" at Gandhi Institute For Education & Technology (GIET) was established in the year 2009 with the approval of AICTE having intake of 60 seats.

The department is concerned to impart smart education through the process of design, development and application of computer systems and information processing techniques with an ideology to meet the 2020 IT-challenges. The department is also committed to disseminate the most up-to-date drift in software industry. This ensures flourishing career for scholar with foremost IT companies. The department activities accompany with an instance of innovation, variation and exaggeration to extend nurturing of academics. The department also contributes to the noble cause of furthering our discipline by providing training in various certification programs to student and faculty member.

The department is steadily marching its mission with a strong backbone of members of faculty satisfying the student staff ratio of 15:1 and having minimum retention of 6 years. Our faculty members are determined and have good in attitude. The teaching and research mission of the Department encompass a wide range of areas, including Social Networking and Knowledge engineering, data mining, web mining, artificial intelligence, cryptography and security, databases, software engineering, computer architecture, compilers, operating systems, programming languages, artificial intelligence, computer graphics and multimedia visualization, parallel & distributed computing and soft computing.

The department possesses 4 well-equipped air-conditioned hi-tech laboratories that provide excellent facilities for teaching, learning activities. All the laboratories are equipped with Vodafone leased line Internet connectivity (Wired and Wi-Fi) of 45 Mbps. Also department manages the Super Computer Lab, for research activities round the clock with uninterrupted power supply backup, local intranet for the department as well as institute service.

The department organizes seminars, workshops and short-term courses time to time which usually get wide response from the faculties, students and global researchers. All the staff and student of the department are members of the Computer Society of India. The department encourages its member's faculty and students to present and participate seminars, symposiums and conferences on a regular basis to cope up with the changing trends in computer science and information technology.

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Analysis of queries associated with virtual machines using stochastic optimization techniques

Sidhanta Kumar Balabantray, Anil Kumar Mishra
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: The principal aim of virtualization is to increase the hardware utilization to a maximum, decrease hardware costs by regrouping multiple machines virtualized into one physical machine. Cloud computing permits to reduce hardware cost, reduce the energy consumption and allow a more efficient use of servers. It is seen that lot of servers may be utilized not in a proper way duc to underutilization. So the uses of cloud computing associated with virtualization may be a solution to the problem. In general the utilization of virtualization within cloud computing may provide the virtualization and sharing of physical resources within the cloud. The usage of virtualization sometimes may introduce a degradation of performance due to additional overhead and higher utilization rates. This paper aims to evaluate total CPU references in terms of instruction sequencing along with queries associated with virtual machines.

Keywords: Virtualization, cloud, paravirtualization, CPU references

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A fundamental study of scheduling algorithm for Cloud Computing Job Selection

Sambit Kumar Mishra, Bijaya Nanda
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing is a computing paradigm. In the recent era Cloud Computing is one the most challenging and developing areas of Information Technology. With the advent of the technology more and more cloud devices are being setup, more companies are for cloud services. Cloud has made up a virtual reality of the practical world. Cloud Computing is a practical approach to experience the direct cost benefits and it has the potential to transform the datacenters from a capital intensive set up to variable priced environment. One of the aspects of cloud computing is provision of servers to allocate the resources and scheduling the jobs. In the cloud environment job selection and scheduling is the basic activity. In this paper I focused on devising an algorithm to schedule jobs and allocate servers in cloud systems. The simulation results of the algorithms are provided and the comparisons are shown in forms of graphs.

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Threats in Cloud Computing and Security Issues

Chinmaya Ranjan Pattnaik, Prakash Chandra Jena
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing is basically an Internet-based network made up of large numbers of servers mostly based on open standards, modular and inexpensive. Clouds contain vast amounts of information and provide a variety of services to large numbers of people. In this paper, various typesof services, visibility, working principle and the benefits of cloud computing like Reduced Data Leakage, Decrease in evidence acquisition time, eliminate or reduce service downtime, Forensic readiness and decrease evidence transfer time etc are discussed. The main factor to be discussed is security of cloud computing, which is a major risk factor involved in major computing fields.

Keywords: Cloud computing; Reduced Data Leakage, Forensic readiness.

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Access of Cloud Hetrogeneous Data Using a Virtual Engine

Batakrishna Tripathy, Satya Krishna. V
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Accessing data from numerous widely distributed sources poses significant new challenges for query optimization and execution. Failures and congestion in the network can produce highly variable response times for wide area data access. The causes of high variability are typically failures and congestion which are inherently runtime Issues, they cannot be reliably predicted at query optimization time or even at query start up time. We introduce a class of dynamic run time query plan modification techniques that we call query plan scrambling which will be executed on distributed query processing virtual engine. The efficient execution of complex queries posed by end users is an important and challenging task. In this paper, a virtual engine is introduced which aims at providing a solution for query execution in the cloud.

Keywords: Query scrambling, Query plan, Cloud, private cloud, public cloud, virtual machine, and virtualization.

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Recent Research Trends on Big Data in Cloud Computing Environments

K.G.S. Venkatesan, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: In these days of computing as a public utility, analyzing and processing big data is a common phenomenon. To reduce the cost in terms of economy of scale, to improve flexibility and convenience, think of is needed in the direction of cloud computing. In this paper the utility and major issues in concern with cloud computing for its convenient applicability in education and, different business and government paradigm has been reviewed. Privacy and security issues in cloud computing are its major drawback due to which many enterprises are in hesitation to invoke cloud computing. Continuous research is going on to resolve the associated issues and improve the applicability of cloud computing in different directions. As cloud computing is at infantry stage more and more research work is needed for its overall growth, in this paper attempt has been made to identify the key research dimensions in cloud computing.

Keywords: Big data, cloud computing, cyber security, business and government paradigm, education.

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Virtualization Tools Performance Evaluation in Multi-Threaded Applications

Purnya Prava Nayak, Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: In the last decade, virtualization technologies have become very popular. Virtualization enables a user to run multiple operating systems on the same computer concurrently, while providing a degree of isolation between OS instances. Even though virtualization is mostly used on servers, its popularity on desktop also rises, where it is mostly used in cross-platform development and execution of software available to other platforms. Since both of these use cases are performance intensive, the goal of this paper is to evaluate the performance of a couple of the most popular desktop virtualization tools on the market, i.e., VMware Player and Oracle Virtual Box. Benchmarks used in this paper evaluate the performance of the tools in both CPU intensive and GPU intensive applications, with special emphasis placed on the performance of multi-threaded applications.

Keywords: Multi-Threading, Performance Evaluation, Virtualization, Virtualization Tools.

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Audio Codecs in Cloud Computing

K.Muralibabu, Dhaneswar Parida
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: A codec is a device of computer program capable of encoding or decoding a digital data stream of signal. Now a days we are dealing with words like mp3, mp4, aac, 3gpp etc. Let us solve the mystery behind the latest technology in audio and video processing techniques and its use in Cloud computing. The perceptual audio range of a human being is 20 Hz to 20 kHz. That means the human ear can sense the sounds in this range of frequency. If we want to store the audio outcome from a source we must store the human ear perceptual range of frequency components. Generally the audio output from a source is in analog form. Before the development of digital data storage, the audio signals stored in analog form on devices like magnetic tapes and gramophone etc. the analog signals again converted to sound when we need them. In analog format the data storage is costly, bulky, power consuming and of less quality. These disadvantages can be overcome by digital signal processing techniques. Also we can use the Cloud computing for better usage of the digital techniques.

Keywords: digital signal processing (DSP), audio processing, encoding and decoding, embedded programming, Streaming, Media Cloud, Mobility, Controlled Cloud. Clouders.

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Impact of CR M Cloud Aps Sales in Marketing Campaign.
(A Study of Small Enterprises in Odisha (A State of India) Market)

Sachi Nandan Mohanty, P.Karunakar Reddy
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Marketing is exceedingly complex, lacks any thoroughly any reliable rules and deals mostly with the unpredictable. Despite the complexity, it still is the most challenging and satisfying of all organizational activities. However today, the market scenario is such that, success stories are much fewer than failures, due to intense competition. Therefore, the success of a marketer is directly proportional to his/her ability to satisfy the consumers. Going the CRM way, companies believe in leveraging technology to build a relationship with customers, both in the long term as well as in the short term. Therefore, the use of CRM cloud software goes a long way in acting as cutting edge technology thereby streamlining and automating business processes, resulting in a seamless integration and recall the best and most sophisticated solution to customer problems. Cloud computing promises to provide quicker, easier, and less expensive computing support for e-commerce. Its use has resulted in user satisfaction which automatically translates into customer loyalty.

Keywords: Cloud computing, customer loyalty, sales and Marketing, tracking and monitoring, forecast accuracy, revenue, data repository, channel management, client satisfaction.

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Implementing Security in Virtual Machines in Cloud during Query Phasing

Nirjharinee Parida, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Now-a-days virtual machines are creating interests among scientists. The main advantage with virtual machines are that even if multiple operating systems exist in a computer still they are isolated with each other. So in cloud when a query is processed data are shared and in a virtual machine number of operating systems are working. So data security is a major issue over there. Though encryption is provided but now the concern is who should manage and control the encryption key. A cloud service provider can decrypt the data without the knowledge of the data owner which is unethical. In this paper we propose a scheme to provide better security to data in cloud during query phasing.

Keywords: Cloud, Virtual Machine, Encryption, Query phasing.

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Role of Cloud Computing In Retail Sector: An Overview

G.Arul Dalton, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing is an emerging technology in the era of computers. The cloud computing is proving itself to be very essential in the current scenario for storing of data, resource management, network management etc. In retail sector data storage and management is a challenging task. Cloud computing is working to handle retail data in an efficient manner in terms of storage, resource allocation and management, query processing.

Keywords: cloud computing, retail data, resource allocation

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Performance Evaluation of Virtual Machines Along With Security Mechanisms

Smrutirekha Das, Sumit Kar
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing has been the subject of many researches. Researches shows that cloud computing permit to reduce hardware cost, reduce the energy consumption and allow a more efficient use of servers. Nowadays a lot of servers are used inefficiently because they are underutilized. The uses of cloud computing associate to virtualization have been a solution to the underutilisation of those servers. However the virtualization performances with cloud computing cannot offers performances equal to the native performances. Presently, cloud computing is more popular and market observers believe it to be the future, provided it is free from the security problems. Security issues over cloud computing is definitely one of the major concerns that many companies are trying to recognize. However, some companies are also concerned about regulatory issues. In past few years, the public Infrastructure- as-a-Service (IaaS) cloud industry has become more complex with many cloud service providers. Some of the security mechanisms offered by the services indicate there is also still room for innovation and experimentation. In this paper it is focused to evaluate differences and possible reasons for it. Because sometimes, it may also contrast the security mechanisms offered by public laaS cloud. Cloud computing allows users to access infrastructure, storage, software and deployment environment. Also data centers of today are rapidly moving towards the use of server virtualization as a preferred way of sharing a pool of server hardware resources. Due to the dynamics present in the system there is need for continuous tuning of the scheduling parameters. In this paper it is also focused to evaluate performance of the controller that optimizes the applications running on various domains.

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Virtualization in Cloud Computing: Threats and Security Issues

Dona Chakrabarty, Bright Anand D
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: In the networking computing environment, Cloud Computing can be said as the next generation of it, since it provides an availability to both hardware and software as per demand for services and utilities over the World Wide Web. Cloud computing is often referred to as manipulating, configuring and accessing the different applications and resources online. As there is a huge exchange of data, the main concern is security. In cloud computing Virtualization is a lead attribute. In this paper, we emphasis on the security of the virtual machines in a virtualized environment.First, we outline the security concerns in virtual machines and then the different issues and problems in security that are present in a virtual network are discussed and are analyzed based on Oracle VM Server for x86. Finally this paper presents a virtual network outline focusing upon how to minimize the inter- communication among various virtual machines integrated in physical machines with better security.

Keywords: Cloud Environment; Security and protection; virtual network; KVM (Kernel-based Virtual Machine).

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Odia Translation using Cross-Language Mappings in Cloud

Surabi Parida, Dibyasha Das
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Odia is the sixth Indian language to be designated a classical language in India. Also, Odia is a predominant language of Odisha, where native speakers make up 80% of the population. The oldest evidence for Odia dates back to the 3rd century BCE. Even if, Odia language is spoken & used by over 40 million people and having such an important Indian language, as of now there is no significant translation tool available for Odia language. On the other hand although 95% Schools use Odia as the main medium for study in Odisha, still there are rarely any Digital Education Materials available for Odia Language. Today, with wealth of Educational information available in English and other languages available through social networks and World Wide Web, there is an undeniable need to formulate efficient techniques to process such data to make the digital information available in Odia Language. This paper presents a method for forming inter-lingual i.e. word-for-word or phrase-for-phrase mappings between languages for Odia Translation.

Keywords: Odisha, Architecture, algorithm, language

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Virtualisation & Performance Evaluation of Virtual Machine in Cloud

Dona Chakrabarty, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: This paper takes a tour of virtualization of virtual machines (VMs) and shows how we can measure performance of VMs in cloud. Nowadays, how to appropriately choose hypervisor for the desired server/desktop virtualization is really challenging, because a trade-off between virtualization performance and cost is a hard decision to make in the cloud. This paper introduces ûve distinct virtualized cloud computing servers (VCCS), and gives appropriate assessment to ûve well-known hypervisors in VCCS based on total cost of ownership (TCO) and return of investment (ROI). As a result estimation of TCO/ROI are totally different among them. Lastly we have to choose ESX server if we need highest ROI and lowest TCO scheme in server virtualisation, but cost is too much. Instead the best choice is Proxmox Virtual Environment (Proxmox VE) because it saves the initial investment a lot to own a high-performed virtualized infrastructure in server virtualization.

Keywords: Hypervisor, Virtualized cloud computing server, TCO, ROI, iSCSI, storage technique.

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A Comparison of Machine Learning Algorithms for Crop and Crop Yield Prediction Research

Binay Kumar Panigrahi,Anil Kumar Mishra
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Farming analysts demand the requirement for an effective system to play an imperative and significant job in the development of national economy. In a nation like India agribusiness contributes about 20% of national GDP. This expectation will assist the ranchers with choosing relevant harvests for development in their homestead as per the climate gauging components, for example temperature, precipitation and furthermore soil ph. All these authorize of information will be inspected. We will prepare the information with different appropriate ML calculations for making the necessary model. The framework accompanies a model that is pinpoint and impeccable in anticipating crop yield and gives the end client appropriate backing about the harvest that can be become dependent on climatic and soil boundaries of the land which improve to expand the harvest yield and increment rancher turnover.

Index Terms: Comparing Algorithms, Crop yield, Machine Learning , Prediction , Crop.

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A Comprehensive and Effective Framework for Biometric Authentication via Cloud Services

Sidhanta Kumar Balabantray, Batakrishna Tripathy
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract : Rather than an on location server cloud services will be services that are accessible from a dispersed cloud stockpiling worker. These measured frameworks are worked by an outsider and give clients access to PC assets, for example, investigation or systems administration over the Internet. Cloud Computing is utilized to give processing assets over the Internet and is utilized to store information on cloud workers. Security and information insurance have been a critical field of interest in cloud processing because of the sharing of assets. Cloud service suppliers store and hold client data through server farms that are influenced by information spillage.. It is observed that many mechanisms have stressed data protection and have neglected privacy in the subsequent process. Authentication aids with preserving and verifying the identity of a recipient. We also suggest an effective technique to use two biometric models for safe message transmission to create a session key between two interacting parties. Finally, the reliability and utility of the proposed solution was seen by detailed trials and a comparative analysis.

Index Terms: Authentication, biometric-based security, cloud service access, session key.

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A New Biometric Approach for Person Authentication

Sambit Kumar Mishra, Satya Krishna. V
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: This Paper presents a Finger-knuckle-print (FKP) a new member of the biometrics family for person authentication. FPK is an inherent skin pattern of the outer surface around the phalangeal joint of one's finger. It has high capability to discriminate different individuals and has many advantages over existing biometrics. FKP recognition system comprises four major components: FKP image acquisition, ROI extraction, Feature extraction, and Feature matching. New entropy based features are used for matching over a database, which consists of 7920 images from 660 different fingers. The performance of the system is measured in terms of recognition rate and compromising results are obtained.

Keywords: Finger-knuckle-print; Authentication; entropy- based features; biometrics

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A Systematic Review of Biometric System Requirements

Bijaya Nanda, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Biometrics is robotized strategies for perceiving a man in view of a physiological or behavioral trademark. Among the elements measured are face, fingerprints, hand geometry, penmanship, iris, retinal, vein, and voice. Biometric advancements are turning into the establishment of a broad cluster of exceedingly secure distinguishing proof and individual check arrangements. As the level of security ruptures and exchange misrepresentation expands, the requirement for profoundly secure recognizable proof and individual check innovations is getting to be noticeably obvious. In this review, we have inspected what is a biometric system along with its types and need in the present scenario.

Keywords: biometrics; iris; fingerprint; signature

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Acquiring knowledge How to Learn: Using Metalearning to Enhance Deep Learning

Surabi Parida,P.Karunakar Reddy
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Meta-Learning describes the abstraction to designing more elevated level components associated with preparing Deep Neural Networks. The expression "Meta- Learning" is tossed around in Deep Learning writing often referencing "AutoML", "Few-Shot Learning", or "Neural Architecture Search" when in reference to the robotized design of neural system architectures. Rising up out of entertainingly titled papers such as "Figuring out how to learn by inclination descent by slope descent", the success of OpenAI's rubik's solid shape mechanical hand demonstrates the development of the thought. Meta-Learning is the most promising worldview to propel the state-of-the-craft of Deep Learning and Artificial Intelligence. Meta-learning is one of the most dynamic regions of research in the profound learning space. A few ways of thinking inside the Artificial Intelligence(AI) people group buy in to the postulation that meta-learning is one of the venturing stones towards opening Artificial General Intelligence(AGI). As of late, we have seen a blast in innovative work of meta-learning systems. In any case, a portion of the essential thoughts behind meta-learning are still generally misconstrued by information researchers and designers. From that point of view, we figured it may be a smart thought to audit a portion of the crucial ideas and history of meta-learning just as a portion of the mainstream calculations in the space.

Keywords: Deep Learning; Meta learning; Artificial General Intelligence

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An Overview of Intrusion Detection Systems

Dibyasha Das, Smrutirekha Das
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Intrusion Detection System which is also known as IDS has been reviewed with its pros and cons. The demand of different smart devices such as laptops, smart phones are increasing to gain network connectivity vastly. Therefore numerous companies have begun to work on means in order to accomplish this task. There are several researchers in past in which different IDS model and their working has been discussed. But these researches have their own limitations. This paper discusses different types of IDS technologies such as Network Based IDS, Wireless IDS, Network Behavior Anomaly Detection, Host Based IDS etc. More over need of IDS and issues faced during its use has been explained in this review paper.

Keywords: Network security, IDS, Mobile Computing Devices

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Analyzing feelings in online shopping using a recommendation system

Dona Chakrabarty, Nirjharinee Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Sentiment analysis gives significant information for decision making in various domains. Online shopping has become more and more popular because of its variety of types,lowest price and models. Now a days many people use online shopping to purchase the product through the Internet. Sentiment analysis also known as reviewing people opinion about the product. It uses natural language processing and computational linguistics to extract subjective information from the given data and classify opinions. The sentiments include ratings, reviews and emoticons. The proposed system use stochastic learning algorithm which analyze various feedbacks and user reviews which are classified as negative, positive and neutral. Our method was evaluated against real user data collected from an online website. Hybrid Recommendations is one of the important module of the system which helps overcome the drawbacks of the traditional Collaborative and Content Based Recommendations. We implemented supervised learning algorithm (Support Vector Machine) to improve the accuracy of results. It gives better performance than existing method. The proposed system helps the people to find out correct review of the product.

Keywords: Sentiment analysis, reviews, stochastic learning algorithm, hybrid recommendation, support vector machine.

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Challenges and Attacks on Security in Wireless Sensor Network

G.Arul Dalton, Sumit Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: A remote sensor arranges (WSN) has significant applications, for example, remote ecological screen and target following. This has been empowered by the availability, for the most part as of late, of sensors that are minor, less expensive, and shrewd. These sensors are furnished with remote interface with which they can speak with each other to frame a system. Right now, agreement with the wellbeing of the remote sensor systems. Gazing by a compact general thought of the sensor organizes, and talks about the current situation with the security assaults inside WSNs. Different sorts of assaults are talked about and their restrict measures exhibited.

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Cloud Computing and IoT: Remote Monitoring of IoT Devices

Bright Anand D, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Remote Monitoring Of Iot Devices is an epitome of an IOT and Embedded Applications. It adds on the functionality of any existing system by providing an ease of In Application Update using Remote Programming capability. So, one can program or reprogram his /her device with some clicks from a remote location, when connected to Internet. That includes the capability to provision software to devices directly through OTA (Over the air) update. In addition, it provides provisioning like device tracking, live status update, reporting and monitoring. In the early days of IoT, updating remote de vices often caused intermittent disruption and performance degradation.The potential benefits of this are significant: minimizing labour costs, time and energy are saved, reduced need for on- site maintenance, improved device uptime/utilization, longer machine life due to preventive maintenance, longer lifetime of critical components.

Keywords: OTA, Firmware's, MQTT, Linux, IOT, Remote monitoring, Protocol, Status update

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Cloud computing and the Internet of Things are important for healthcare systems

Chinmaya Ranjan Pattnaik, Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Cloud computing can be defined as the high demand presence of the computer technology, mainly for storing the data, for calculating the power, shorn of for unswerving data management by the operator. Cloud computing can be commonly defined as the storage stock for data of uncountable number of users of the technology services.The Internet of things (IOT) is an interconnected computing device. It interconnected different types of machine and objects like mechanical, digital, human etc. It provides the unique identifier (UID) and functionality to transfer data on internet without human interaction. Cloud computing is an emerging field in computer science. It is designed to deliver number of computing services via networked such as web.The internet of things has made it possible for-off the nursing of patients on the quick access in the healthcare stream by consuming the less amount of time, unchecking the potential for the safety of the patients regarding their health, and also encouraging the specialists to give the best level of treatment for the patients. Due to IOT the communication between the patients and doctors have become quite easy and in less amount of time. As a result, the satisfaction level of the patients has increased and the solution for patient's problem has also become easily available. Due to IOT the costs in healthcare systems have become significant along with the outstanding results. IOT is undoubtedly transforming the healthcare industry by redefining the space of devices and people interaction in delivering healthcare solutions. In this paper author introduce the idea of cloud computing and internet of things in healthcare and its scope. IoT application is mainly used in healthcare by the hospital and insurance companies for the assistance of patients.

Keywords: Cloud computing in health care system, iot in healthcare system, advantages and disadvantages in healthcare system, future scope, present condition, applications

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Comparative Study of Hormone Level-Based Thyroid Disease Using Data Mining Methods

K.G.S. Venkatesan, Prakash Chandra Jena
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Classification is one of the most important technique in machine learning. It has been found that classification is most widely used in all sectors. Classification is supervised learning technique which uses predefined data set to make accurate decisions. In this work, we use techniques such as SVM, KNN, Decision tree and Naïve bayes, Random forest and Logistic Regression to identify the type of thyroid disease using ANACONDA as software and python programming language is used to implement these algorithms. As last step, we compare accuracy of logistic regression and random forest and represent in graphical form. This system is used to provide diagnosis report of thyroid to patients with reduced cost.

Keywords: KNN, Naive bayes, ANACONDA, Decision tree, Random forest, Logistic Regression.

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Comparing Security Features of Android and iOS

Purnya Prava Nayak, Sachi Nandan Mohanty
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: The usage of Smartphones in regular life has progressed in the recent years bringing new ways to create and transfer personal and business information. Android and iOS are the two mostly used platform among various mobile operating systems. Out of which Android users are slightly more than iOS, 1.4 billion android users and 1.0 billion iOS users worldwide at present. There are issues in the use of strong security controls in Android as well as iOS versions. This paper concerns about all the security control issues related to these two mobile operating system. This work presents the comparison between Android and iOS based on various security parameters such as communication, vulnerabilities in software, hardware, malware, resource management. It also states solutions to enhance and improve the current using parameters in the system.

Keywords: Security; Android; iOS; Mobile Operating System(MOS)

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Data Concealing in Web Pages

K.Muralibabu, Dhaneswar Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Internet is changing all the time. It continues to be the most democratic of all the mass media. This growth and change of internet has developed the demand for techniques that ensures information security on web pages. There are 3 main methods for securing data on web pages viz. Steganography, Cryptography, Watermarking. Steganography is one of the method to hide message from unapproved audience by embedding data inside various kinds of files like Audio, Video, Images and even text documents. This paper concentrates on various Steganography methods which makes use of web pages to hide the data.

Keywords: Steganography; Data-Hiding Technique; Web Based Steganography; Informaton Concealing in Web Pages

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Data Mining for Virtual Learning Environments in Education

Anil Kumar Mishra, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: There is an increase in e-learning using VLE (Virtual learning environment) over years and there is also increase in understanding the teacher, student and also management relationships in a institution. This study is done by data mining and when it is used for educational purposes it is known as EDM (Educational Data Mining). The data acquired from the VLE processed by Data Mining Techniques give us a certain patterns and characteristics of individual and their online interaction which can be used for further enhancing education system in a institution or education society. This paper aim is to make familiar with data mining concept, data mining techniques used in EDM and usage of these techniques with VLE data.

Index Terms: VLE, EDM, Data Mining

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Deep Learning Algorithm for Lung Cancer Classification

Sidhanta Kumar Balabantray, Sumit Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Lung cancer is one of the most killer diseases in the developing countries and the detection of the cancer at the early stage is a difficult task. Analysis and cure of lung malignancy have been faced by humans over the most recent couple of decades. In this project, we use Support Vector Machine (SVM) based on deep learning algorithm to classify the tumors found in lung as malignant (cancerous tumor) or benign (non-cancerous tumor). By using deep SVM technique, the lung nodule can be detected by three dimensional image processing technique and modules are based on data mining technique. The accuracy obtained by means of SVM is 96%, which is more efficient when compared to accuracy obtained by the traditional neural network system.

Keywords: Support Vector Machine (SVM), image processing, computed tomography, feature extraction.

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Deep Learning-Based Evaluation of Image Aesthetics (based on High Level Image Attributes)

Sambit Kumar Mishra, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Aesthetic assessment of images has been getting a lot of attention for the past decade in the field of computer vision. Large amounts of social media and advertising data in the form of images is continuously analyzed to assign it an aesthetic quality value to improve businesses as well as for gaining more popularity across the web. Visual perception by humans cannot be fully replicated by a machine and continuously more work is being published on aesthetic classification of images. In this paper, we have presented a convolutional neural network model which automatically extracts high level features and distinguishes a set of images into pleasing and non-pleasing categories. Our dataset has been compiled from a variety of sources on the web to make it as diverse as possible. Compared to the traditional handcrafted methods and other machine learning models, our CNN model has provided a better classification accuracy of 68% on our dataset.

Keywords: Machine learning, CNN, deep learning, image aesthetic classification, high level attributes

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Design and Development of Digital Image-Based QR Code Recognition

Bijaya Nanda, Sachi Nandan Mohanty
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: One of the most challenging topics is the recognition of qrcode recognition from image and encryption or decryption the information. The recognition of qrcode that was defines by computer or made by the computer its self using some encryption or decryption algorithm. The particular domain is the information is encrypted or decrypts information it describe particular information in secret code that contain authentication. QR code is the type of matrix barcode, which was first designed for the automotive industry by Denso Wave in Japan. The QR Code system has become admired outside the automotive industry due to its fast readability and greater storage capacity compared to standard UPC barcodes. This paper take account of QR codes basics, its real time application in day to day life and research areas associated. With the technology of mobile phones constantly emerging, especially in the area of mobile internet access, QR codes seem to be an adequate tool to quickly and efficiently converse URLs to users. This also allows offline media such as magazines, newspapers, business cards, public transport vehicles, signs, t-shirts and any other medium that can embrace the print of a QR code to be used as carriers for advertisements for online products. QR code being so versatile because of its structural flexibility that it leads to so many diverse field for research such as increasing data capacity, security applications such as different kinds of watermarking and steganography as well. Some experiments have also been done for better recognition of the QR code image that includes scratch removal techniques. Thus, this paper is an attempt to highlight some of possible research areas while considering QR codes.

Index Terms: QR code, Universal Product Code (UPC), watermarking, security, data capacity, scratch removal, steganography, encryption, decryption.

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Enhanced Data Security in Cloud-basedE-Health Care System

Chinmaya Ranjan Pattnaik, Dhaneswar Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Medical Health Records are getting used in healthcare services to deal with the challenges and limits of paper-based techniques, but acceptance has been limited because of the high cost of implementation and storing data. Thanks to their unfamiliarity with electronic medical systems, many hospitals have relied on paper-based approaches. The foremost common concerns are counseling, data sharing, and authority delegation. Implementation of Medical Data Management Cloud computing in healthcare is currently a well-established trend. Additionally, the proposed model includes a patient data security mechanism that gives a high level of patient data confidentiality and authentication not found in existing applications.

Keywords: Cloud,Cryptography,Authentication,Confidentiality

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Enhancing Security in OTP or IRIS Recognition-Based Biometric Automatic Teller Machines (ATMs)

Prakash Chandra Jena, Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: The loot of ATM cards has been increasing over the past few years, in the current system PASSCODE are used for ATM transactions. Which can easily be stolen, speculated or misused in many ways with it. It inspired to increase user security by adding biometric and OTP to the existing system. It also brought up some issues including sensor durability and time consumption. As a solution We introduce a constraint on transactions by ATMs involving biometric (finger print) to improve the system to resolve performance and issues. If we exceed the amount entered, we are adding a limit on the cash amount It is necessary to present the limit, biometric. There is no biometric scanning if one is required to withdraw the minimum cash. Mandatory will only enter OTP for user authentication. It helps users to save time and maintain sensor performance Their biometric not presented for a few hundred except to maintain security.

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Examining Green Cloud Computing: An Action to Preserve the Environment Worldwide

Batakrishna Tripathy, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract : The Cloud Computing, most prominent internet- based computing technology wherein almost all the IT companies are planning and designing their software applications and infrastructure. It stands-out as the ever- growing and competent technology due to advancement in computing hardware, economically feasible and simplicity in use for technophile engineers over the globe. In today's green IT the energy consumption of software has increased largely, so it needs to be economic and environmental imperative. Therefore, green cloud computing is emergent in solving the issues of global warming. This paper gives you the systematic study of green cloud computing by elaborating it in various aspects like energy efficiencies, datacenter power management and virtualization with the brief discussion. We have reviewed over 14 research papers featuring various different aspects of green standards and green approaches, strategies, technologies proposed till current year in a tabular format.

Keywords: Green Computing, Cloud Computing, global environment, Energy saving, recycling software, virtualization.

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Fake Currency Detection using Deep Learning Technique

Satya Krishna. V, P.Karunakar Reddy
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Gigantic automation expansion in publish and inspect manufactory build inauthentic complication to promote dynamically as a outcome inauthentic legal tender affects tied in husbandry along with diminish the profit of aboriginal money ergo it is and essential concerning ascertain the artificial legal tender most of the erstwhile methods are established as foraccoutermentsandresemblancecomputingapproachobservationinauthenticlegaltenderwiththesemethodsisinferior efficaciousalso time ingest to conquer the raised complication we have bounce the discernment of inauthentic legal tender applying a bound less complexity nervous chain our work recognize the artificial legal tender by inspect the legal tender appearance the communicate educated complexity nervous chain is competent with two thousand five hundred two hundred and fifty Indiancurrencynotedatasetstolearnthefeaturemapofthecurrenciesoncethefeaturemapislearntthenetworkisreadyforidentifyingthe fake currency in real time the proposed approach efficiently identifies the forgery currencies of 2000500200 and 50 with less time consumption keywords convolutional neural network currency detection deep learning feature extraction image processing.

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Fighting Online Abuse and Using Social Networking Site Reporting Features Online

Dibyasha Das ,Nirjharinee Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Online abuse has emerged as a huge problem across the Internet and especially on social networking sites (SNS). Online social network is key for spread the message and abuse videos to the people. The main objective of this study is to identify the factors driving people to use online reporting functions on Social network sites we need to analysis and block that website based on features of machine learning algorithm.

Keywords: Tweets messages, Abuse detection, Social crime, Preprocessing, Tokenization and Stamping.

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Hybrid Machine Learning and Application in the Classification of Diabetes

Dona Chakrabarty, G.Arul Dalton
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: This paper manages to predict the Diabetes of patient by applying an examination of three different hybrid Machine learning techniques. Further, by fusing all the current gamble elements of the dataset, we have noticed a steady exactness subsequent to characterizing and perform Cross-valuation. We have figured out a method to accomplish a steady and most noteworthy precision of 100% with triple hybrid algorithm which has a combination of XG Boost, Ada Boost and Random Forest. The main aim of this paper is to track diabetes at initial level and determine the accuracy rate using ML techniques and it has been successfully achieved in the results.

Index Terms: Diabetes ,insulin level, machine Learning algorithms, accuracy, k-nearest, Random forest, etc

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Improving Face Recognition and Detection Performance

Purnya Prava Nayak,Smrutirekha Das
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Human Face is complicated multidimensional visual model which is very crucial for human identity. Facial Recognition is one of the most challenging issues of biometrics. Hence; it is difficult and essential to recognize the face. In this paper, we will notice almost latest methodologies which are used from earlier to recognize the face from the images using digital cameras. Here we will represent past and present covering algorithms for the same field by using convolution neural network (CNN, or ConvNet) in deep learning and Artificial Neural Network (ANN). This paper discusses various Artificial Neural Network (ANN) approaches towards Face Detection and Recognition.

Keywords: Face Detection and Recognition Algorithms, Convolution neural network (CNN), Deep Learning, Artificial Neural Network (ANN)

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Improving Healthcare Security Mechanisms with Triple DES

K.Muralibabu, Bright Anand D
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Hospitals as well as healthcare industry are opting to new strategies to excel and improvise the ability in their business so that to demonstrate higher price of healthcare. The project deals with the medical branch and patient management. Since cloud computing grants convenient, on- demand access to shared pools of statistics, applications. It provides unlimited infrastructure to store and execute patient records and program, which can be stored within the database. The proposed scheme guarantees that cyclic redundancy take a look at and time-examined practices and technologies for managing believe relationships in traditional employer environments can be prolonged to work efficiently in both non-public and public clouds. Triple DES algorithm is used to hold the data extra steady and safe. The information of the patient may be grouped based totally on their attributes like income and profession, also they are able to capable of hide their details. Fingerprint may be used to acquire the details of the patient and which provides excessive security for the patient information, and they can able view their details each time they need. Appointment for the patient may be performed to lessen the manpower. Those practices include statistics encryption, strong authentication and fraud detection.

Keywords: Cloud computing, security, grouping, fingerprint, online appointment.

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Optimizing Cloud Performance and Effectiveness with De-Duplication Algorithms

Surabi Parida, K.G.S. Venkatesan
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract : Data duplication in the one of the major problems inthe cloud which occupies a larger amount of space in the cloudserver also with the larger repeated data. Also, there is some threat of security of the data because of the duplication of the same data which is not being encrypted. In this paper, we are going to implement a collaborative algorithm in combining theitems classification and using the concept of the cloud model. Firstly the data are being filtered by using their property type and inner classified by the size of the data along with the data name and data similarity. Now the data is being clustered with data similarity using k-mean algorithm. Then the repeated data duplication is being filtered and deleted, keeping one original data. Now the original data is being mapped to different user having the same data and tagged with Boolean values. Now this single data is being encrypted and will be having both public and private keys, whereas the original owner of the data will be having the private key while remaining users mapped to the similar data will be having the public key which is used only to view the data. Now the data is being clustered with data similarity using k-we implement a prototype of our own proposed authorized duplicate check scheme and conduct testbed experiments using our prototype by reducing the amount of space along with avoidance of data duplications.

Keywords: Data duplication; De duplication; Findingduplicates

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Intelligent Support for Digital Evidence in Digital Forensics

Bright Anand D, Sumit Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: In the digital era, most of the users have suffered from a loss of data, unauthorized modification of data which led to the origination of Digital Forensics. It is the application of science and technology used to find criminal and obey civil laws. It is mainly used for the investigation of the crime and is governed by certain legal standards of evidence and procedure of crime. This paper contains manually tested tools used for extraction of data from any storage device (it doesn't matter if a device is corrupted or blank), after data recovery, the recovery folder contains audit file from the help of this we have summarized the result of all types of data recovery and their metadata too. During the criminal investigation, the forensic scientists have to collect the Digital evidence, which might be, stored any digital device used by the suspect or victim that has been seized by investigators. The literature relevant to Forensic Science, as explored in this paper, focuses on the various categories of forensics, anti-forensics, architecture of various mobile operating systems like IOS and Android. It also throws light upon various categories of Digital Forensics and the digital investigation tools, which can be used to trace the criminal activities of a suspect involving the use of any digital device that is capable of storing data in it. It also contains the snapshots of the data recovery performed using the KALI LINUX (FORENSICS MODE).

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IoT & 5G Literature Review

Anil Kumar Mishra, Prakash Chandra Jena
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: The future of human life will be dependent on Internet of Things and 5G, which will transform the devices into intelligent machines. The purpose of this paper is to give an overview of IoT and 5G. In this paper, all the basic information about IoT and 5G is provided and also that how these technologies can change the perspective of human towards digital world. Because these technologies are going to be very useful in daily life for any type of person, from a small child to an old man, and from a student to a business tycoon. However, this paper will help new researchers, who wants to do research in these technologies.

Keywords: IoT, 5G, Frameworks, Contribution

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Raspberry Pi-based IOT-based dairy data management system

Sidhanta Kumar Balabantray, Chinmaya Ranjan Pattnaik
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Milk is a supplement rich, white fluid food produced by the mammary organ of evolved creatures. The high calibre milk ought to have thickness and must be devoid of adulterants. The country milk makers expect fair price for the milk produced and the consumers expect good quality milk at a reasonable cost. So it is important to guarantee the quality of milk by estimating different parameters such as temperature and fat of milk. This work aims to build up an automated system to determine the milk parameters and also measure the weight or amount of milk. With the help of Internet of Things (IOT) this huge database can be maintained in the cloud platform which is safe and secure than the existing method. All these information can also be shared with the farmers as well as with the higher authorities of dairy farms and subsequently information transparency can be maintained. This work can also be used in several other applications where data management and online financial transactions are required.

Keywords: Tkinter; Ubidots; Weight Sensor; IOT

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IoT-powered Smart Helmet

Sambit Kumar Mishra, K.G.S. Venkatesan
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: As we know India is second most populated country and has a large youth population, nowadays youth are fond of bikes and because of fashion, they neglect wearing helmet. Because of these, bike accidents are increasing day by day which causes deaths. Major deaths are due to head injuries which can be prevented by wearing a helmet. Drunk and drive cases are becoming more, which causes accidents and due to lack of negligence where an accident occurs and people are dying. These incidents made us develop a smart helmet using internet of things which reduce the accidents and risk of deaths, which has following features, the bike starts only if the rider wears a helmetif the rider is over drunken then the ignition will be automaticallyoffed and if any accident occurs then through GSM modem it willsend the message to the registered contact number by using a simcard.

Keywords: Fond; GSM modem; Internet of things; Ignition; Smart helmet.

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Machine Learning in software engineering: recent progress and future research directions

Satya Krishna. V, P.Karunakar Reddy
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Machine learning is the analysis of building computer programs that develop their performance through experience. To assemble the challenge of developing and managing large and complex software systems in a dynamic and changing environment, machine learning techniques have been playing a progressively more important role in much software development and maintenance tasks. Machine learning techniques have proven to be of huge practical value in a diversity of application domains. Not amazingly, the field of software engineering emerging to be a fertile area where many software development and maintenance tasks could be invented as learning problems and approached in terms of learning algorithms. The history of two decades has witnessed a rising interest, and some heartening results and publications in machine learning application to software engineering. As a consequence, a crosscutting niche area emerges. Presently, there are some efforts to raise the awareness and profile of this crosscutting, emerging area, and to systematically study various issues in it. Some of the latest advances in this emerging niche area is presented in this paper.

Keywords: Machine learning, Software engineering, analyticallearning, supervised learning.

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Biometric identification using palm prints and machine learning algorithms

Sachi Nandan Mohanty, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Biometrics have gained popularity over the last decade and palm print have rich and unique features which makes it a reliable biometric identification methodology. There are many different low resolution palm print recognition algorithms have been developed. Deep learning plays a prominent role in biometrics. This paper focus on the process of design palm print biometrics system, from summary of palm print databases with their characterizations and pre- processing, feature extraction and training the dataset with RFCNN deep learning algorithm and also, we present some palm print recognition techniques and some research works related to palm print purposes.

Keywords: Palm print, Feature extraction, RFCNN

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Logistic regression and machine learning for web application firewall

G.Arul Dalton, Nirjharinee Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: As data packets move to and from a website or web application, a web application firewall (WAF) keeps track of, filters, and stops them. Companies commonly use web application firewalls as a security measure to guard web systems from known and unknowable dangers and vulnerabilities as well as zero-day exploits, malwares, impersonation, and other attacks. This paper proposed a machine learning-based approach for a web application firewall. Utilizing various payloads, our suggested model produced classification accuracy of99% using the method of logistic regression.

Keywords: Web Application Firewall, machine learning, signature-based WAF , vulnerabilities, Zero-day attacks.

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Online Attendance System

Amit Gupta, Bright Anand D
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Real-time face detection is one part of the automatic face recognition system and also used in developing an independent research subject. So, there are many approaches to overcome problems in face detection. This paper introduces a new approach in automatic attendance management systems, extended with computer vision algorithms .In our proposed system real time face detection algorithms are used in integration with an existing Learning Management System (LMS), which automatically detects and registers students attending on a lecture. The system represents a supplemental tool for instructors, algorithms used in machine learning are combined with adaptive methods used to track facial changes during a longer period of time. Time consumption is lesser than traditional methods, at the same time being nonintrusive and does not interfere with the regular teaching process. The tool promises to offer accurate results and a more detailed reporting system which shows student activity and attendance in a classroom.

Keywords: Computer Vision, Object Tracking, Face Recognition, Machine Learning and Teaching

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Online Plagiarism Detection and Outcome Assessment using NLP and Data Mining

Bijaya Nanda, Dhaneswar Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Plagiarism is the process of copying a document from other document and this project is to find not only the plagiarism being done in the paper but to find the part also where the plagiarism has been applied so it can be easily understandable. The percentage and the sentence which are being copied from other document can be detected from this application so we can ensure if anyone is copying the content from any document. The most important factor most of theplagiarism detection is on website but this is an application so it can be found easily. It ensures that no actor of the system is copied by others. Hence coordinating, maintaining and making sure that all activities in the application is synchronized. A review on plagiarism in assignments, its drawbacks, and the solution to overcome the drawbacks are presented in this paper.

Keywords: Supply Natural Language Processing, TF-IDFVectorizer, Rabin-Karp Algorithm, KMP Algorithm

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Big Mart Sales Predictive Analysis with Machine Learning Algorithms

Purnya Prava Nayak, Sumit Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Currently, supermarket run-centers, Big Marts keep track of each individual item's sales data like item name, price, etc.. in order to Meet consumer demand and update inventory management. Anomalies and general trends are often discoveredby mining the data warehouse's data store. For retailers like Big Mart, the resulting data can be used to forecast future sales volume using many machine learning techniques like big mart. A predictive model was developed using Xgboost, Linear regression, Polynomial regression, and Ridge regression techniques for forecasting the sales of a business such as Big -Mart, and it was discovered that the model outperforms existing models.

Keywords: Linear Regression, Polynomial Regression, RidgeRegression, Xgboost Regression .

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Analysis of HR Salary Prediction Using Machine Learning Methods

Batakrishna Tripathy, K.Muralibabu
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Information irregularity amongst employers and employees has become a problem that needs immediate solving. The probable applicants are most often kept blind with regards to the interview procedure and only are aware of it at the end. In the meantime, the employers must be committed to rightly meeting up with the candidate's prospects for making new HR strategies that satisfy the demands of the applicant. Therefore, one must be vigilant enough to not offer too low a salary, which would result in the decline in not just the salary but also will build more irresponsible, lack-luster individuals with longer untaken positions. Whilst the vice-versa would also be a cause ofconcern leading to wastage of companies vital resources. Therefore, it is imperative to provide an unbiased salary for an employee which he/she truly deserves, and also has to be appropriate to the market demands. This paper is based on predicting the salary by training a Machine Learning model and performing comparative analysis on Logistic Regression and Support Vector Machine using their classification reports.

Keywords: Logistic Regression, Support Vector Machine, Data Mining, Statistics, Machine Learning

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Quantum PCs - a Way to deal with Decrease Time Intricacy?

Surabi Parida,Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Quantum computers are the outcome of upgraded technology used to remove time complexity. Quantum computers are expert in its own the field which investigates computational and other properties of computer based on mechanical principles. In quantum computers important objective is to find quantum algorithms that are significantly faster than classical algorithms. Here we give a brief introduction to quantum computers considering some physical system that can be i N different mutually exclusive classical states. Call these states |1i,|2i,... ,|Ni. Classical states .A pure quantum state is a superposition of classical states, written |φi = α1|1i+ α2|2i+···+ αN|Ni [1].

Keywords: Quantum Computers, Classical Computers, High Performance.

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Reduplication of Cloud Data in a Secure Way with Effective Re-Encryption

Dibyasha Das, Smrutirekha Das
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Data deduplication technique has been widely adopted by commercial cloud storage providers, which is both important and necessary in coping with the explosive growth of data. To further protect the security of users sensitive data in the outsourced storage mode, many secure data deduplication schemes have been designed and applied in various scenarios. Among these schemes, secure and efficient re- encryption for encrypted data deduplication attracted the attention of many scholars, and many solutionshave been designed to support dynamic ownership management. In this paper, we focus on the re-encryption deduplication storage system and show that the recently designed lightweight rekeying- aware encrypted deduplication scheme (REED) is vulnerable to an attack which we

Keywords: Security, Cloud service Providers, deduplication, shared key.

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Study of Machine Learning Algorithm for Predicting Heart Disease

Dona Chakrabarty, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: As we all know cardiovascular(Heart Disease) failure infection is one of the main source of death in around the world. In present current age passings because of the cardiovascular failure has became significant issue, approximately one individuallost their life each moment as a result of heart sickness. So the significant test these days is to anticipate the Occurrence of illness in beginning phases. So to conquer this we can execute Machine Learning in medical care so it is able to do early and precise recognition of infection. In this undertaking, the emerging circumstances of cardiovascular failure ailment is determined. Datasets utilized have characteristics of clinical boundaries. The datasets are been handled utilizing ML calculation i.e., Random Forest in python. In this procedure the previous patient data is utilized to get forecast of new one in beginning phases to forestall the passings and to save life. As referenced, solid coronary illness expectation is executed utilizing Random Forest Algorithm whichis solid ML Algorithm. Which read patient dataset as CSV document. Subsequent to handling the dataset the activity is carried out and successful cardiovascular failure level is created. Benefits of this proposed framework are greater precision and execution rate and it is having greater pace of progress and is veryflexible.

Keywords: Heart attack disease, prediction, data sets, Machine Learning , Random Forest , CSV files, Algorithm

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Secure Auditing System for Shared Data in Cloud Storage that is Easy to Use

Anil Kumar Mishra, Bijaya Nanda
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: A cloud platform providers users with shared data storage services, Users can remotely store the data to the cloud and realize the data sharing with others. An audit scheme that enables group members to modify data conducts the integrity and verification of the shared data. This results in the complex calculations for the group members who shared the data in the cloud .It ignores the security risks between the group members and the agents. A lightweight secure auditing scheme can be used to protect the shared data. To introduce an effective Third Party Auditor, the auditing process of the shared data is easy towards user privacy and introduce no additional burden to users in the cloud storage. The third party auditor can be used to secure the data on behalf of the users.It supports the privacy preserving public auditing.The security analysis and the performance evaluation proves that the proposed system is highly secured and efficient to trust in the cloud service platform.

Keywords: Shared data, Auditing scheme, Security, Cloud service Providers.

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Secure Voting System Authentication with Iris Detection

Sidhanta Kumar Balabantray, Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: India being a democracy that too worlds largest, still conducts its elections using either Secret Ballet Voting or Electronic Voting Machines (EVM) both of which involves high costs, manual labor and are inefficient. So, the system must be optimized to be made efficient which would not leave room for unwanted means of voting. The most familiar issue faced by the election commission is inappropriate confirmation with respect to the arrangement of casting the votes, duplication or illegal casting of votes. The proposed biometric electoral authentication system allows the user to scan s so that his or her credentials can be compared to existing iris images already stored in the system's database. Present Aadhar database will be integrated into voting authentication system. Using detection of iris based authentication decreases the chance of duplicating a vote and those who are registered prior to the election and are recognized by the system will be allowed to vote. Hence, the approach makes the system the best way to vote. In proposed project, biometric based authentication avoids anonymity and the focus is on making the voting system more robust and reliable by eliminating dummy voters. By using Daughman's algorithms will scan IRIS and check those details in our database for match.

Keywords: Iris Detection, Authentication , Voting System

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Internet of Things Security in Wide Area Public Networks

Dona Chakrabarty,Chinmaya Ranjan Pattnaik
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: In current scenario, world is emerging with new technologies due to tremendous inventions and innovations day by day. Up gradations in existing systems and devices in engineering as well as technological domain are broadly getting increased. Physical objects are considerably integrated along with the information network for remote access. Major services are focused to interact industrial and domestic devices over the Internet to extend the functionality in broader sense. In this current digital era due to the availability of various embedded systems and smart sensors it helps to focus on automation using artificial intelligence. Networking them through (internet of things) IoT helps the modern world to greater extent. This paper focusses widely on the implementation of integrating IoT with industrial and domestic appliances and illustrating the benefits of integrating with each other.

Keywords: Internet of things, data, network, devices, sensors, technology, communication.

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Server less Architecture: the Next Evolution in Cloud Computing

Dibyasha Das, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: The strategy of software developer to develop software architecture lies in the range of its blueprint or plan via conceptual model to achieving desired target. It is assuredly true that the lack of architecture can make software failure. Good architecture may help to progress a web or mobile application and poor architecture may cause serious issues leads to highly costly to recover again. Understanding the signification of choice regarding architecture and making plan in advance is paramount to creating effective, high performing and basically successful software systems. . The existing software architecture is typically three tier architecture, with heavy lifting weight residing in the back end. The user interface really just serves as a convenient way for the user to drive functions in the back-end. But this is inefficient to build because there is a huge amount of duplication. In this architecture there are lots of layers to touch for adding new features. The vision for future that sees a generation of light weight cloud connected devices is based on server less architecture. With the release of function execution as service technologies such as AWS Lambda developers are now building entirely server less platform. In these new architectures, traditional backend servers are replaced with cloud functions acting as discrete single purpose services. These are stateless functions are used to perform protected actions, execute business logic and set up interaction with vast array of powerful cloud services. This is characterized by rich thick client applications talking directly to cloud data stores and small cloud based micro services for protected workloads and service orchestration. This article introduces server less architecture, key services such as AWS Lambda and describes the principles and benefits of server less architecture system.

Keywords: Software Architecture, Server less Architecture

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Service Level Contract for Ad Hoc Cloud Computing Implementation

Purnya Prava Nayak, Nirjharinee Parida
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Cloud computing is a boon to the technologicaladvancement which provides a flexibility and ensures a security to its users on some agreed upon services like Pay peruse service, Software as a service, platform as a service and Infrastructure as a service. The need of service level agreement in cloud computing gives a framework for a defined set of condition from the both ends. This SLA gives assurance to its users. The service level agreement proposed in this paper provides freedom to employ the ad hoc cloud computing as it supports the security concern.

Keywords: Service Level Agreement, Pay per use, Service Provider, ad hoc, cloud computing

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An overview of the conversation on automation in banking utilizing chatbots that speak artificial machine intelligence

Surabi Parida, Smrutirekha Das
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Software Defined Networking (SDN) is enabling organizations to accelerate application deployment and delivery, dramatically reducing IT costs through policy-enabled workflow automation. SDN technology enables cloud architectures by delivering automated, on-demand application delivery and mobility at scale. SDN enhances the benefits of data center virtualization, increasing resource flexibility and utilization and reducing infrastructure costs and overhead. Since the advent of OpenFlow, researchers have been working to improve and of course facilitating the abstraction of network control plane from the Networking devices. This paper takes a lot at the inside-out of SDN, taking OpenFlow into effective use. This paper alsodetails the architecture of SDN and OpenFlow, implementation, cost effectiveness and why organization should take advance of this cutting-edge technology to enhance productivity in their business while promising short and long cost worthiness and easy maintainability.

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The function of Internet of Things devices and machine learning: a preliminary investigation in relation to smart cities

Sachi Nandan Mohanty, G.Arul Dalton
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: This paper is an explorative study to analyze the role of various Machine Learning (ML). Algorithms which can beused for Internet of Things (IoT) devices. Since the growth in useof Internet of Things devices, the ease and quality of living of Human species has touched a different level. Everyday creating ahuge amount of data. While. Machine learning on the other handis ensuring that this Big Data is analyzed optimally and innovatively. Through this paper we are also trying to explore thepossibilities of combining these two approaches ML and IoT; to understand its application in the field of Smart cities.

Keywords: Machine learning, Internet of Things, Big Data and Smart city

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Utilizing a Raspberry Pi, the Intelligent Virtual Assistant (IVA) DIVA is a conversational system

P.Karunakar Reddy, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: We are living in an era where we are interacting with machines day in day out. In this new era of the 21st century, a virtual assistant (IVA) is boon for everyone. It has opened the way for a new world where devices can interact their own. The human voice is integrated with every device making it intelligent. These IVAs can also be used to integrate it with Business Intelligence Software's such as Tableau and PowerBI etc. to give dashboards the power of voice and text insights using NLG (Natural Language generation). This new technology attracted almost the entire world like smart phones, laptops, computers, smart meeting rooms, car InfoTech system, TV etc. in many ways. Some of the popular voice assistants are like Mibot, Siri, Google Assistant, Cortana, Bixby and Amazon Alexa. Voice recognition, contextual understanding and human interaction are some of the issues, which are continuously improving in these IVAs and shifting this paradigm, towards AI research. This research aims at processing Human Natural Voice and give a meaningful response to the user. The questions, which it is not able to answer, are stored in a database for further investigation.

Keywords: Voice Assistant, Google Home, Alexa, Conversational System, Text-to-Speech, Speech-to-Text IOT, Sensor Data, RaspberryPi3.

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Web-Based Application Software Product Line Technologies

Sumit Kar, K.Muralibabu
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: In the emerging technological world, the amount of software products that are being developed are huge. With ever software that is getting developed, a new form of Product Line is emerging. It is certainly necessary to have some standard form Product Line to manage and develop these products faster and more efficiently. In our paper we are going to look into Software product line technologies for web based systems. We will review the basic concepts of software Product line , discuss its benefits and their drawbacks. We will also be primarily understanding the web based technology to understand which product line suits its best.

Keywords: Software technology; Software Product line; Web based system

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Database Security: Dangers, Attributes, and Countermeasures

Dhaneswar Parida, Batakrishna Tripathy
Gandhi Institute for Education and Technology, Baniatangi,Bhubaneswar

Abstract: Nowadays the speed at which data is generated is very high and rapid; so store and manage this enormous data, it is placed in the Database System. In this Database System the data is maintained and manipulated. Since this vast data is stored in the Database, this Database needs to be secured. Security involves protecting and shielding the data and the Database from unauthorized usage and malicious attacks. With the increase in the complicatedness of the Database the types of attacks increases and so security becomes a crucial issue. Through this paper, various techniques are presented which will make the Database more secure and strengthened.

Keywords: DBMS, SQL, Privileges, Queries, Encryption, Cryptography, Steganography

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Comparative study on Virtual Machine Monitors for cloud

Anil Kumar Mishra, Sidhanta Kumar Balabantray
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud Computing is the distributed architecture in which scalable resources are used to provide computing services to user using virtualization concept. Cloud requires virtual machine for accessing any guest operating system at local desktop, this is handled by software interface such as Virtual Machine Monitor (VMM) or hypervisor. This paper reveals not only its features architecture, working but also comparative analysis of Kernel Virtual Machine (KVM) and Xen using various benchmarking tools. Paper also explains test analysis of measuring CPU performance, network speed and disk access. From this analysis which hypervisor has to be used for the implementation of cloud computing system for getting better performance is decided.

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Approaches for optimizing virtual machine placement and migration in cloud environments: A survey

Sambit Kumar Mishra, Bijaya Nanda
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing is a model for providing computing resources as a utility which faces several challenges on management of **virtualized resources**. Accordingly, **virtual machine placement** and migration are crucial to achieve multiple and conflicting goals. Regarding the complexity of these tasks and plethora of existing proposals, this work surveys the state-of-the-art in the area. It presents a cloud computing background, a review of several proposals, a discussion of problem formulations, advantages and shortcomings of reviewed works. Furthermore, it highlights the challenges for new solutions and provides several open issues, showing the **relevancy** of the topic in an increasing and demanding market.

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Performance evaluation of live virtual machine migration in SDN-enabled cloud data centers

Chinmaya Ranjan Pattnaik, Prakash Chandra Jena
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: In Software-Defined Networking (SDN) enabled cloud data centers, live VM migration is a key technology to facilitate the resource management and fault tolerance. Despite many research focus on the network-aware live migration of VMs in cloud computing, some parameters that affect live migration performance are neglected to a large extent. Furthermore, while SDN provides more traffic routing flexibility, the latencies within the SDN directly affect the live migration performance. In this paper, we pinpoint the parameters from both system and network aspects affecting the performance of live migration in the environment with OpenStack platform, such as the static adjustment algorithm of live migration, the performance comparison between the parallel and the sequential migration, and the impact of SDN dynamic flow scheduling update rate on TCP/IP protocol. From the QoS view, we evaluate the pattern of client and server response time during the pre-copy, hybrid post-copy, and auto-convergence based migration.

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Evaluating And Modeling Virtualization Performance Overhead For Cloud Environments

Batakrishna Tripathy, Satya Krishna. V
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Due to trends like Cloud Computing and Green IT, virtualization technologies are gaining increasing importance. They promise energy and cost savings by sharing physical resources, thus making resource usage more efficient. However, resource sharing and other factors have direct effects on system performance, which are not yet well-understood. Hence, performance prediction and performance management of services deployed in virtualized environments like public and private Clouds is a challenging task. Because of the large variety of virtualization solutions, a generic approach to predict the performance overhead of services running on virtualization platforms is highly desirable. In this paper, we present experimental results on two popular state-of-the-art virtualization platforms, Citrix XenServer 5.5 and VMware ESX 4.0, as representatives of the two major hypervisor architectures. Based on these results, we propose a basic, generic performance prediction model for the two different types of hypervisor architectures. The target is to predict the performance overhead for executing services on virtualized platforms.

Keywords: Virtualization, Modeling, Benchmarking, Performance

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A Threshold-based Dynamic Resource Allocation Scheme for Cloud Computing

K.G.S. Venkatesan, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: *Compared to traditional distributed computing paradigms, a major advantage of cloud computing is the ability to provide more reliable, affordable,* flexible resources for the applications (or users). The need to manage the applications in cloud computing creates the challenge of on-demand resource provisioning and allocation in response to dynamically changing workloads. Currently most of these existing methods focused on the optimization of allocating physical resources to their associated virtual resources and migrating virtual machines to achieve load balance and increase resource utilization. Unfortunately, these methods require the suspension of the cloud computing applications due to the mandatory shutdown of the associated virtual machines. In this paper, we study the resource allocation at the application level, instead of studying how to map the physical resources to virtual resources for better resource utilization in cloud computing environment. We propose a threshold-based dynamic resource allocation scheme for cloud computing that dynamically allocate the virtual resources (virtual machines) among the cloud computing applications based on their load changes (instead of allocating resources needed to meet peak demands) and can use the threshold method to optimize the decision of resource reallocation. The proposed threshold-based dynamic resource allocation scheme is implemented by using CloudSim, and experimental results show the proposed scheme can improve resource utilization and reduce the user usage cost.

Keywords: cloud computing, dynamic resource allocation, *virtual resource, scheme*

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Energy-Efficient Virtual Machines Consolidation in Cloud Data Centers Using Reinforcement Learning

Purnya Prava Nayak ,Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Dynamic consolidation techniques optimize resource utilization and reduce energy consumption in Cloud data centers. They should consider the variability of the workload to decide when idle or underutilized hosts switch to sleep mode in order to minimize energy consumption. In this paper, we propose a Reinforcement Learning-based Dynamic Consolidation method (RL-DC) to minimize the number of active hosts according to the current resources requirement. The RL-DC utilizes an agent to learn the optimal policy for determining the host power mode by using a popular reinforcement learning method. The agent learns from past knowledge to decide when a host should be switched to the sleep or active mode and improves itself as the workload changes. Therefore, RL-DC does not require any prior information about workload and it dynamically adapts to the environment to achieve online energy and performance management. Experimental results on the real workload traces from more than a thousand PlanetLab virtual machines show that RL-DC minimizes energy consumption and maintains required performance levels.

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Recommendations for Virtualization Technologies in High Performance Computing

K.Muralibabu, Dhaneswar Parida
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: The benefits of virtualization are typically considered to be server consolidation, (leading to the reduction of power and cooling costs) increased availability, isolation, ease of operating system deployment and simplified disaster recovery. High Performance Computing (HPC) environments pose one main challenge for virtualization: the need to maximize throughput with minimal loss of CPU and I/O efficiency. However, virtualization is usually evaluated in terms of enterprise workloads and assumes that servers are underutilized and can be consolidated. In this paper we evaluate the performance of several virtual machine technologies in the context of HPC. A fundamental requirement of current high performance workloads is that both CPU and I/O must be highly efficient for tasks such as MPI jobs. This work benchmarks two virtual machine monitors, Open VZ and KVM, specifically focusing on I/O throughput since CPU efficiency has been extensively studied [1]. Open VZ offers near native I/O performance. Amazon's EC2 “ClusterCompute Node” product is also considered for comparative purposes and performs quite well. The EC2 “Cluster ComputeNode” product utilizes the Xen hyper visor in hvm mode and 10Gbit/s Ethernet for high throughput communication. Therefore, we also briefly studied Xen on our hardware platform (in hvmmode) to determine if there are still areas of improvement in KVM that allow EC2 to outperform KVM (with InfiniBand host channel adapters operating at 20 Gbit/s) in MPI benchmarks. We conclude that KVM's I/O performance is sub optimal, potentially due to memory management problems in the hyper visor. Amazon's EC2 service is promising, although further investigation is necessary to understand the effects of network based storage on I/O throughput in compute nodes.

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Section B : Computer Science

Computing Resources Scalability Performance Analysis in Cloud Computing Data Center

Sachi Nandan Mohanty, P.Karunakar Reddy
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Today, cloud computing has become an essential technology in modern times, offering a wide range of benefits to organizations of all sizes. It provides access to computing resources on-demand over the internet, reducing costs and enabling organizations to respond quickly to changing business needs. Dynamic scalability is a crucial feature of cloud computing, allowing the system to dynamically allocate resources based on user demand at runtime while providing high quality of service (QoS) and performance to clients with minimal resource usage. This paper proposes a stochastic model based on queueing theory to study and analyze the performance of cloud data centers (CDC) and meet service level agreements (SLA) established with clients. The model is used to examine various performance metrics, including the mean response time, the mean waiting time, the probability of rejection, and the utilization of the system, as the arrival rate and the service rate vary. Simulation results are provided using the CloudSim simulator. The results of the analysis and simulation show that our model accurately estimates the number of virtual machines (VMs) required to meet QoS objectives, making it a valuable tool for improving the performance and scalability of cloud data centers. The results obtained from our analytical model are validated by an experimental example conducted on the Amazon Web Services (AWS) cloud platform.

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Secure virtualization for cloud computing

Nirjharinee Parida, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing adoption and diffusion are threatened by unresolved security issues that affect both the cloud provider and the cloud user. In this paper, we show how virtualization can increase the security of cloud computing, by protecting both the integrity of guest virtual machines and the cloud infrastructure components. In particular, we propose a novel architecture, Advanced Cloud Protection System (ACPS), aimed at guaranteeing increased security to cloud resources. ACPS can be deployed on several cloud solutions and can effectively monitor the integrity of guest and infrastructure components while remaining fully transparent to virtual machines and to cloud users. ACPS can locally react to security breaches as well as notify a further security management layer of such events. A prototype of our ACPS proposal is fully implemented on two current open source solutions: Eucalyptus and OpenECP. The prototype is tested against effectiveness and performance. In particular: (a) effectiveness is shown testing our prototype against attacks known in the literature; (b) performance evaluation of the ACPS prototype is carried out under different types of workload. Results show that our proposal is resilient against attacks and that the introduced overhead is small when compared to the provided features.

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Improving the Efficiency of Deploying Virtual Machines in a Cloud Environment

G.Arul Dalton, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Flexible allocation of resources is one of the main benefits of cloud computing. Virtualization is used to achieve this flexibility: one or more virtual machines run on a single physical machine. These virtual machines can be deployed and destroyed as needed. One obstacle to flexibility in current cloud systems is that deploying multiple virtual machines simultaneously on multiple physical machines is slow due to the inefficient usage of available resources. We implemented and evaluated three methods of transferring virtual machine images for the Open Nebula cloud middleware. One of the implementations was based on BitTorrent and the other two were based on multicast. Our evaluation results showed that the implemented methods were significantly more scalable than the default methods available in Open Nebula when tens of virtual machines were deployed simultaneously. However, the implemented methods were slower than the default unicast methods for deploying only one or a few virtual machines at a time due to overhead related to managing the transfer process. If the usage pattern of the cloud is such that deploying large batches of virtual machines at once is common, using the new transfer methods will significantly speed up the deployment process and reduce its resource usage.

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Fault Tolerance- Challenges, Techniques and Implementation in Cloud Computing

Smrutirekha Das, Sumit Kar
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Fault tolerance is a major concern to guarantee availability and reliability of critical services as well as application execution. In order to minimize failure impact on the system and application execution, failures should be anticipated and proactively handled. Fault tolerance techniques are used to predict these failures and take an appropriate action before failures actually occur. This paper discusses the existing fault tolerance techniques in cloud computing based on their policies, tools used and research challenges. Cloud virtualized system architecture has been proposed. In the proposed system autonomic fault tolerance has been implemented. The experimental results demonstrate that the proposed system can deal with various software faults for server applications in a cloud virtualized environment.

Keywords: Cloud Computing; Virtual Machine; Fault Tolerance; Replication

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Performance Analysis of Network Virtualization in Cloud Computing Infrastructures on OpenStack

Bright Anand D, Dona Chakrabarty
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing has become popular in IT technology because of advantages that focus on flexible, scaling, resources and services which help customers easy to build their own on-demand IT system. Cloud computing also has ability to balance, share, and manage IT resources between customers to get better performance. OpenStack, a new open source cloud computing framework which was a built-in modular architecture and focus on IaaS. OpenStack also focuses on NaaS by using network virtualization technology and OpenStack has been used popular in business. This paper does a research on network performance on OpenStack network module code name Neutron. The parameter related to network performance such as throughput, package loss, time and delay of data transmission are estimated through UDP protocol. Our research investigated the possible internal traffic flow pattern and evaluated network performance of each pattern on OpenStack cloud computing environment.

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Provision of Data-Intensive Services Through Energy- and QoS-Aware Virtual Machine Placement in National Cloud Data Centers

Surabi Parida, Dibyasha Das
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Many data-intensive services (e.g., planet analysis, gene analysis, and so on) are becoming increasingly reliant on national cloud data centers (NCDCs) because of growing scientific collaboration among countries. In NCDCs, tens of thousands of virtual machines (VMs) are assigned to physical servers to provide data-intensive services with a quality-of-service (QoS) guarantee, and consume a massive amount of energy in the process. Although many VM placement schemes have been proposed to solve this problem of energy consumption, most of these assume that all the physical servers are homogeneous. However, the physical server configurations of NCDCs often differ significantly, which leads to varying energy consumption characteristics. In this paper, we explore an alternative VM placement approach to minimize energy consumption during the provision of data-intensive services with a global QoS guarantee in NCDCs. We use an improved particle swarm optimization algorithm to develop an optimal VM placement approach involving a tradeoff between energy consumption and global QoS guarantee for data-intensive services. Experimental results show that our approach significantly outperforms other approaches to energy optimization and global QoS guarantee in NCDCs.

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Anomaly detection in cloud environment using artificial intelligence techniques

Anil Kumar Mishra, Bijaya Nanda
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Now days the usage of cloud environment is rapidly increasing in all the fields to run applications in virtual machines instead of physical hardware based machine. This increases the service availability and also reduces the cost. The usage of openstack cloud environment is also increasing both in academics and industry as it provides open source cloud services to run the application both for research and for production environment. One of the challenges in cloud environment is that the detection and prediction of the anomalies before they occur. In the traditional approach, the anomalies are detected manually by keeping track of threshold level and heartbeat. The recent research is happening on using machine learning techniques in detecting the anomalies before they occur. In this paper, we propose a model for anomaly detection in openstack cloud environment. In the proposed model, we used Stacked and Bidirectional LSTM models to build the neural network. For the experiment the data is collected from openstack using collectd. The collected data sets 10 features and class label. Using LSTM neural network, we were able to detect the anomalies in openstack environment. The proposed model achieved the detection accuracy of 94.61% for training set and 93.98% for the test set using binary cross entropy function as a loss function.

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Performance Optimization of Workload usage with Virtualization in Cloud Computing Environment

Sidhanta Kumar Balabantray, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Traditional application integration technologies are performed in a rigid and slow process that usually takes a long time to build and deploy, requiring professional developers and domain experts. They are server-centric and thus do not fully utilize the computing power and storage capability of client systems. Cloud computing is a new infrastructure deployment environment that delivers on the promise of supporting ondemand services like computation, software and data access in a flexible manner by scheduling bandwidth, storage and compute resources on the fly without required end-user knowledge of physical location and system configuration that delivers the service. This paper presents the architecture and the organization of a Mashup Container that supports the deployment and the execution of Event Driven Mashups i.e., Composite Services in which the Services interact through events rather than through the classical Call-Response paradigm, following the Platform as a Service (PaaS) model, i.e., the deployment of customer-created applications in cloud platform. In collaboration with PaaS, Virtualization provides an opportunity for extension of independent virtual resources based on available physical systems. In addition, it can provide significant benefits in data centers, such as dynamic resource configuration, live virtual machine migration. Services are deployed in virtual machines (VMs) and resource utilization can be greatly improved. This paper highlights the results of virtualization of mashup container through its supporting scalability and fault tolerance in cloud computing environment.

Keywords: Cloud Computing, Mashup Container, Platform as a Service (PaaS), Virtualization

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Enhancing Performance and Energy Efficiency for Hybrid Workloads in Virtualized Cloud Environment

Sambit Kumar Mishra, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Virtualization has attained mainstream status in enterprise IT industry. Despite its widespread adoption, it is known that virtualization also introduces non-trivial overhead when tasks are executed on a virtual machine (VM). In particular, a combined effect from device virtualization overhead and CPU scheduling latency can cause performance degradation when computation intensive tasks and I/O intensive tasks are co-located on a VM. Such an interference also causes extra energy consumption. In this paper, we present Hylics, a novel solution that enables efficient data traverse paths for both I/O and computation intensive workloads. This is achieved with the provision of in-memory file system and network service at the hypervisor level. Several important design issues are pinpointed and addressed during our prototype implementation, including efficient intermediate data sharing, network service offloading, and QoS-aware memory usage management. Based on our real-world deployment on KVM, we show that Hylics can significantly improve computation and I/O performance for hybrid workloads. Moreover, this design also alleviates the existing virtualization overhead and naturally optimizes the overall energy efficiency.

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Performance evaluation of task scheduling algorithms in virtual cloud environment to minimize makespan

Chinmaya Ranjan Pattnaik, Satya Ranjan Biswal
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing has emerged as a foremost technology utilizing the notion of commercial application of technology with public users. Cloud computing is recognized because of its ability to dynamically allocate resources on-demand offering pronounced scalability, performance, minimal maintenance, and cost-effectiveness. The resources are shared among users via the virtualization technique. High performance can be extracted from cloud computing by effectively performing task scheduling. Task scheduling is the primary concern to be considered for the dynamic allocation of resources to enhance performance and minimize the makespan. Task scheduling is considered a major factor because it directly influences the other factors monitoring performance like power consumption, best cost, scalability, and availability. The research work is conducted to calculate the makespan in cloud computing via a virtual environment on four prominent task scheduling algorithms: FCFS (first come first serve), RR (round Robin), SJF (shortest job first), and PSO (particle swarm intelligence). The VMs (virtual machines) and data centers with unique ids have been brought into practice to analyze the working of considered task scheduling algorithms. The execution time required for the successful completion of each stage has been recorded to compute the makespan. The research paper discusses the adopted process used in executing the task scheduling via an appropriate algorithm, pseudocode, and flowchart. The results have been obtained based on the working principle of four task scheduling algorithms and compared based on makespan.

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Virtual Memory Optimization Techniques in Cloud Computing

Prakash Chandra Jena, Satya Krishna. V
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Use of computer resources and sharing of contents has changed the ways along with as the cloud computing comes. One of the important concept of cloud computing is virtualization that plays a vital role to maximize resource usage among large number of users. To efficiently utilize the resources in a virtualized environment; they need to be over committed. Over commitment is the process of allocating more resources to a virtual machine that is physically present on the host. It is based on the principle that the majority of the Virtual Machines will use only a small percentage of the resources allocated to them at a given time. With the virtualization it becomes possible to use all different resources in shared manner and at same time by different time. There are lots of techniques now days are available to make the cloud system to be work more efficiently. This paper performs study of different changes and techniques for memory optimization and management.

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Modeling and simulation of scalable Cloud computing environments and the CloudSim toolkit: Challenges and opportunities

Batakrishna Tripathy, Sachi Nandan Mohanty
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing aims to power the next generation data centers and enables application service providers to lease data center capabilities for deploying applications depending on user QoS (Quality of Service) requirements. Cloud applications have different composition, configuration, and deployment requirements. Quantifying the performance of resource allocation policies and application scheduling algorithms at finer details in Cloud computing environments for different application and service models under varying load, energy performance (power consumption, heat dissipation), and system size is a challenging problem to tackle. To simplify this process, in this paper we propose CloudSim: an extensible simulation toolkit that enables modelling and simulation of Cloud computing environments. The CloudSim toolkit supports modelling and creation of one or more virtual machines (VMs) on a simulated node of a Data Center, jobs, and their mapping to suitable VMs. It also allows simulation of multiple Data Centers to enable a study on federation and associated policies for migration of VMs for reliability and automatic scaling of applications.

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Energy-aware virtual machine allocation for cloud with resource reservation

Satya Krishna. V, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: To reduce the price of pay-as-you-go style cloud applications, an increasing number of cloud service providers offer resource reservation-based services that allow tenants to customize their virtual machines (VMs) with specific time windows and physical resources. However, due to the lack of efficient management of reserved services, the energy efficiency of host physical machines cannot be guaranteed. In today's highly competitive cloud computing market, such low energy efficiency will significantly reduce the profit margin of cloud service providers. Therefore, how to explore energy efficient VM allocation solutions for reserved services to achieve maximum profit is becoming a key issue for the operation and maintenance of cloud computing. To address this problem, this paper proposes a novel and effective evolutionary approach for VM allocation that can maximize the energy efficiency of a cloud data center while incorporating more reserved VMs. Aiming at accurate energy consumption estimation, our approach needs to simulate all the VM allocation updates, which is time-consuming using traditional cloud simulators. To overcome this, we have designed a simplified simulation engine for CloudSim that can accelerate the process of our evolutionary approach. Comprehensive experimental results obtained from both simulation on CloudSim and real cloud environments show that our approach not only can quickly achieve an optimized allocation solution for a batch of reserved VMs, but also can consolidate more VMs with fewer physical machines to achieve better energy efficiency than existing methods. To be specific, the overall profit improvement and energy savings achieved by our approach can be up to 24% and 41% as compared to state-of-the-art methods, respectively. Moreover, our approach could enable the cloud data center to serve more tenant requests.

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Enabling security-aware virtual machine placement in IaaS clouds

Aurobindo Kar, Amit Gupta
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Infrastructure as a Service (IaaS) facilitates the provisioning of virtual machines (VMs) in cloud computing platform for disjoint customers in a highly scalable, flexible, and cost-efficient fashion. However, introducing new VMs to a physical server where vulnerable VM already exists could lead to potential security risks to the new ones. Furthermore, even the physical server itself could be compromised by attackers through one of these vulnerable VMs. Therefore, VM placement could bring great impact over the security level of the whole cloud. In this paper, we first quantify the security risks of cloud environments based on virtual machine vulnerabilities and placement schemes. Based on our security evaluation, we present a novel VM placement algorithm that can minimize the cloud's overall security risks by considering the connections among VMs. According to the experimental results, our approach can greatly improve the survivability of most VMs and the entire cloud. The computing costs and deployment costs of our techniques are also practical.

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Optimizing the performance of optimization in the cloud environment–An intelligent auto-scaling approach

K.G.S. Venkatesan, G.Arul Dalton
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: *The cloud computing paradigm has gained wide acceptance in the scientific community, taking a significant share from fields previously reserved exclusively for High Performance Computing (HPC). On-demand access to a large amount of computing resources provided by Cloud makes it ideal for executing large-scale optimizations using evolutionary algorithms without the need for owning any computing infrastructure. In this regard, we extended WoBinGO, an existing parallel software framework for genetic algorithm based optimization, to be used in Cloud. With these extensions, the framework is capable of elastically and frugally utilizing the underlying cloud computing infrastructure for performing computationally expensive fitness evaluations. We studied two issues that are pertinent when dealing with large-scale optimization in the elastic cloud environment: the computing instance launching overhead and the price of engaging Cloud for solving optimization problems, in terms of the instances' cumulative uptime. To explain the usability limits of WoBinGO framework running in the IaaS environment, a comprehensive analysis of the framework's performance was given. Optimization of both total optimization time and total cumulative uptime, leads to minimizing the cost of cloud resources utilization. In this way, we are proposing an intelligent decision support engine based on artificial neural networks and metaheuristics to provide the user with an assessment of the framework's behavior on the underlying infrastructure in terms of optimization duration and the cost of resource consumption. According to a given assessment, the user can decide upon faster delivery of results or lower infrastructure costs.The proposed software framework has been used to solve a complex real-world optimization problem of a subsurface rock mass model calibration. The results obtained from the private OpenStack deployment show that by using the proposed decision support engine, significant savings can be achieved in both optimization time and optimization cost.*

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Towards an efficient snapshot approach for virtual machines in clouds

Nirjharinee Parida, Smrutirekha Das
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: High-availability of virtual machines is of significant importance for a cloud computing environment, because cloud services may be compromised due to the system maintenance, malicious attacks, and hardware and software failures. The virtual machine (VM) snapshot can effectively back up the state, disk data, and configuration of a machine at a specific time point. However, the existing VM snapshot methods suffer from performance issues such as long downtime and I/O performance degradation during a live snapshot. To address such issues, we proposed an efficient VM snapshot system, iROW (improved Redirect-on-Write), based on the qemu-kvm virtual block device driver. iROW employs the following techniques. (1) A bitmap-based light-weight index method is designed to reduce the query cost of the existing two-level index table structure compared with qcow2. (2) An index-free approach is used for VM state data to improve the performance of data saving and loading operations of VM state. (3) VM state data is separated from disk image data in a snapshot. (4) The free page detection (FPD) is designed using virtual machine introspection to identify and skip saving free pages in the guest OS during snapshotting, thus reducing the VM state snapshot creation time and the snapshot disk space usage. Our experimental results demonstrate that iROW is evidently advantageous over qcow2 in performance, in terms of the disk snapshot, the state snapshot and the disk I/O.

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Virtualizing General Purpose GPUs for High Performance Cloud Computing: An Application to a Fluid Simulator

Sumit Kar, Surabi Parida
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: In this work we present an hypervisor-independent GPU Virtualization Service named GVirtus. It instantiates virtual machines able to access to the GPU in a transparent way. GPUs allow to speed up calculations over CPUs. Therefore, virtualizing GPUs is a major trend and can be considered a revolutionary tool for HPC. To test the performances of GVirtus we used a fluid simulator. Morover to exploit the computational power of GPUs in cloud computing we virtualized three different plugins for GVirtus Framework : Cuda Runtime, Cuda Driver and OpenCL plugins. Our results show that the overhead introduced by virtualization is almost irrelevant.

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A Review on Scheduling in Cloud Fog Computing Environments

Bright Anand D, Dona Chakrabarty
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: The advancement of the Internet of Things (IoT) has prompted countless smart gadgets, which produce hundreds of gigabytes of data per hour. The main challenge is processing the massive amount of IoT data and then providing meaningful information about the data to be processed; while processing data in the cloud takes less time, there will be additional communication delays, whereas fog has minimal delays in communication, but there will be resource constraints. To overcome these challenges, we need to schedule tasks in both the fog and cloud environments as per the accepted time delays. In this paper, we study the security issues in both cloud and fog environments, existing cloud and fog scheduling algorithms, and their limitations. Based, on our comparison study, we found that existing cloud and fog scheduling algorithms need to be improved in terms of the classification of tasks to be executed at fog and cloud levels.

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Checkpointing as a Service in Heterogeneous Cloud Environments

Dibyasha Das, Purnya Prava Nayak
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: A non-invasive, cloud-agnostic approach is demonstrated for extending existing cloud platforms to include checkpoint-restart capability. Most cloud platforms currently rely on each application to provide its own fault tolerance. A uniform mechanism within the cloud itself serves two purposes: (a) direct support for long-running jobs, which would otherwise require a custom fault-tolerant mechanism for each application, and (b) the administrative capability to manage an over-subscribed cloud by temporarily swapping out jobs when higher priority jobs arrive. An advantage of this uniform approach is that it also supports parallel and distributed computations, over both TCP and InfiniBand, thus allowing traditional HPC applications to take advantage of an existing cloud infrastructure. Additionally, an integrated health-monitoring mechanism detects when long-running jobs either fail or incur exceptionally low performance, perhaps due to resource starvation, and proactively suspends the job. The cloud-agnostic feature is demonstrated by applying the implementation to two very different cloud platforms: Snooze and Open Stack. The use of a cloud-agnostic architecture also enables, for the first time, migration of applications from one cloud platform to another.

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The performance evaluation of proactive fault tolerant scheme over cloud using CloudSim simulator

K.Muralibabu, P.Karunakar Reddy
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: The main issues in a cloud based environment are security, process fail rate and performance. Fault tolerance plays a key role in ensuring high serviceability and reliability in cloud. Nowadays, demands for high fault tolerance, high serviceability and high reliability are becoming unprecedentedly strong, building a high fault tolerance, high serviceability and high reliability cloud is a critical, challenging, and urgently required task. A lot of research is currently underway to analyze how clouds can provide fault tolerance for an application. When the number of processes are too many and the virtual machine is overloaded then the processes are failed causing lot of rework and annoyance for the users. The major cause of the failure of the processes at the virtual machine level are overloading of virtual machines, extra resource requirements of the existing processes etc. This paper introduces dynamic load balancing techniques for cloud environment in which RAM/Broker (resource awareness module) proactively decides whether the process can be applied on an existing virtual machine or it should be assigned to a different virtual machine created a fresh or any other existing virtual machine. So, in this way it can tackle the occurrence of the fault. This paper also proposed a mechanism which proactively decides the load on virtual machines and according to the requirement either creates a new virtual machine or uses an existing virtual machine for assigning the process. Once a process is complete, it will update the virtual machine status on the broker service so that other processes can be assigned to it.

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Performance analysis of virtual machines and containers in cloud computing

Dhaneswar Parida, Surabi Parida
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing provides variety of services with the growth of their offerings. Due to efficient services, it faces numerous challenges. It is based on virtualization, which provides users a plethora computing resources by internet without managing any infrastructure of Virtual Machine (VM). With network virtualization, Virtual Machine Manager (VMM) gives isolation among different VMs. But, sometimes the levels of abstraction involved in virtualization have been reducing the workload performance which is also a concern when implementing virtualization to the Cloud computing domain. In this paper, it has been explored how the vendors in cloud environment are using Containers for hosting their applications and also the performance of VM deployments. It also compares VM and Linux Containers with respect to the quality of service, network performance and security evaluation.

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Virtual Machine Provisioning Based on Analytical Performance and QoS in Cloud Computing Environments

Anil Kumar Mishra, Chinmaya Ranjan Pattnaik
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing is the latest computing paradigm that delivers IT resources as services in which users are free from the burden of worrying about the low-level implementation or system administration details. However, there are significant problems that exist with regard to efficient provisioning and delivery of applications using Cloud-based IT resources. These barriers concern various levels such as workload modeling, virtualization, performance modeling, deployment, and monitoring of applications on virtualized IT resources. If these problems can be solved, then applications can operate more efficiently, with reduced financial and environmental costs, reduced under-utilization of resources, and better performance at times of peak load. In this paper, we present a provisioning technique that automatically adapts to workload changes related to applications for facilitating the adaptive management of system and offering end-users guaranteed Quality of Services (QoS) in large, autonomous, and highly dynamic environments. We model the behavior and performance of applications and Cloud-based IT resources to adaptively serve end-user requests. To improve the efficiency of the system, we use analytical performance (queueing network system model) and workload information to supply intelligent input about system requirements to an application provisioner with limited information about the physical infrastructure. Our simulation-based experimental results using production workload models indicate that the proposed provisioning technique detects changes in workload intensity (arrival pattern, resource demands) that occur over time and allocates multiple virtualized IT resources accordingly to achieve application QoS targets.

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Performance Evaluation of Container Orchestration Tools in Edge Computing Environments

Bijaya Nanda, Aurobindo Kar
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Edge computing is a viable approach to improve service delivery and performance parameters by extending the cloud with resources placed closer to a given service environment. Numerous research papers in the literature have already identified the key benefits of this architectural approach. However, most results are based on simulations performed in closed network environments. This paper aims to analyze the existing implementations of processing environments containing edge resources, taking into account the targeted quality of service (QoS) parameters and the utilized orchestration platforms. Based on this analysis, the most popular edge orchestration platforms are evaluated in terms of their workflow that allows the inclusion of remote devices in the processing environment and their ability to adapt the logic of the scheduling algorithms to improve the targeted QoS attributes. The experimental results compare the performance of the platforms and show the current state of their readiness for edge computing in real network and execution environments. These findings suggest that Kubernetes and its distributions have the potential to provide effective scheduling across the resources on the network's edge. However, some challenges still have to be addressed to completely adapt these tools for such a dynamic and distributed execution environment as edge computing implies.

Keywords: edge computing; service scheduling; service orchestration; container; Internet of Things (IoT); Kubernetes; K3s; KubeEdge; ioFog

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Resource Allocation for Real-Time Tasks Using Cloud Computing

Satya Krishna. V, Sunita Barik
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: This paper presents a method to allocate resources for real-time tasks using the "Infrastructure as a Service" model offered by cloud computing. Real-time tasks have to be completed before deadlines, and cloud computing offers selection of resources with different speeds and costs. In cloud computing, resource allocations can be scaled up based on the requirements; this is called elasticity and is the key difference from existing multiprocessor task allocation. Scalable resources make economical allocation of resources an important problem. We analyze the problem of allocating resources for a set of realtime tasks such that the economic cost is minimized and all the deadlines are met. We formulate the problem as a constrained optimization problem and propose a polynomial-time solution to allocate resources efficiently. We compare the economic costs and performance provided by our solution with the optimal solution and an EDF (earliest deadline first) method. We show how the cost varies based on the distribution of the tasks.

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Effective resource utilization in cloud environment through a dynamic well-organized load balancing algorithm for virtual machines

P.Karunakar Reddy, G.Arul Dalton
Gandhi Institute for Education and Technology, Baniatangi, Bhubaneswar

Abstract: Cloud computing is used in almost all domains today. Through the use of cloud-based applications, it has become easier for an internet user to make use of the services and resources that are widely available. The cloud service provider undertakes to deliver all the subscribers' requirements as per the service level agreement (SLA). These resources must be well-protected since they are used by many subscribers. There is a constant high level of demand for these resources and services, and it is therefore necessary to balance the loads on the various servers; this is done in order to avoid congestion in the network and to reduce consumption of the capital or resources. This load balancing uses algorithms such as genetic algorithms (GA) in order to distribute the load on the virtual machines (VM) that are available in the network. A novel load balancing method is proposed, involving a well-organized use of resources, which is known as the dynamic well-organized load balancing (DWOLB) algorithm. This is a powerful algorithm for reducing the energy that is consumed in cloud computing.

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There is no secret to success
It is the result of preparation,
hardwork and learning from failures.

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GANDHI INSTITUTE FOR EDUCATION & TECHNOLOGY

Campus : Baniatangi, Bhubaneswar, Khurda - 752060, Ph. : 06755243600/601/602/603/604
Office : HIG-33, Infront of PAL Heights, Jayadev Vihar, BBSR-751013, Ph. : 0674 2301562
Email : info@gietbbsr.com, WWW.GIETBBSR.COM