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Metric Number: 6.3.2 Percentage of teachers provided with financial support to attend conferences/workshops and towards membership fee of professional bodies during the last five years

Copy of letter/s indicating financial assistance to teachers and list of teachers receiving financial support year-wise under each head for the ACY 2020-21



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List of teacher's receiving financial support for the ACY 2020-21

| Sl. No | Name of the faculty | Sanctioned Amount | Assessment Year | Event Type | Name of conference/ workshop attended for which financial support provided |
|--------|--------------------------|-------------------|-----------------|--------------------|--|
| 1 | Dr. Sowmya | 5000 | 2020 | Conference/Journal | IJIRCCE |
| 2 | Dr. Sowmya | 5000 | 2020 | Conference/Journal | IJRSET |
| 3 | Dr. Ravindra S | 5000 | 2020 | Conference/Journal | IJCSE |
| 4 | Dr. Ravindra S | 5000 | 2020 | Conference/Journal | IJCSE |
| 5 | Dr. Shalini Prasad | 5000 | 2021 | Conference/Journal | International Journal of Engineering Trends and Technology (IJETT), |
| 6 | Ms. Ashwini Hindiholi | 5000 | 2020 | Conference/Journal | ISDSI - Global Conference 2020 |
| 7 | Ms. Gayathri Annasagaram | 5000 | 2020 | Conference/Journal | ISDSI - Global Conference 2020 |
| 8 | Dr. Sujatha | 5000 | 2020 | Conference/Journal | ISDSI - Global Conference 2020 |
| 9 | Ms. Sriraksha S | 5000 | 2020 | Conference/Journal | International Journal of Advanced Research in Education & Technology (IJARETY) |
| 10 | Ms. Madhavi J Kulkarni | 5000 | 2021 | Conference/Journal | International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE) |
| 11 | Mr. Gopikishan J | 5000 | 2020 | Conference/Journal | International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE) |
| 12 | Mr. Harsha Vardhan U | 5000 | 2021 | Conference/Journal | International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET) |
| 13 | Dr. Jyothi P | 5000 | 2021 | Conference/Journal | International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) |
| 14 | Ms. Nagashree G | 5000 | 2021 | Conference/Journal | International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE) |



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| Sl. No | Name of the faculty | Sanctioned Amount | Assessment Year | Event Type | Name of conference/ workshop attended for which financial support provided |
|--------|---------------------|-------------------|-----------------|--------------------|--|
| 15 | Ms. Aurbindo Koti | 5000 | 2021 | Conference/Journal | International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET) |
| 16 | Ms. Sreevidya G | 5000 | 2021 | Conference/Journal | International Journal of Innovative Research in Computer and Communication Engineering (IJRCCE) |


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List of Faculties with financial support for the academic year 2020-2021

| Sl No | Department | Number of Faculties |
|-------|------------|---------------------|
| 1 | AS&H | 5 |
| 2 | CSE | 4 |
| 3 | E&C | 6 |
| 4 | MECH | 1 |

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A Study on Melanoma Detection Using Deep Learning Algorithms

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ABSTRACT: Dermoscopy picture has non-obtrusive conclusion procedure assumes a significant job early examination of risky melanoma. The troublesome picture characteristics includes changing shapes and their irritated sizes, feathery sore limitations, particular dermis covering sorts and closeness of hair. To defeat these constraints, new programmed melanoma location technique for dermoscopy pictures through multi-scale injury one-sided portrayal and joint opposite arrangement. MLR used with JRC for melanoma discovery. JRC model permits us to use a great deal of solidly related histograms to determine additional information. Study done on an open dataset of dermoscopy images and exhibit preferable portrayal execution pondered over the present top tier strategies

KEYWORDS: Melanoma, MLR, JRC

I. INTRODUCTION

Melanoma is the most frequent type of skin cancer and its incidence has been rapidly increasing over the last few decades. Never the less, it is also the most treatable kind of skin cancer, if diagnosed at an early stage. The clinical diagnosis of melanoma is commonly based on the ABCD rule, or the 7-points depending on color, shape, and texture. The hair which is present on skin can be segmented as lesion because of dark pixels being classified as lesion against lighter pixels which will be categorized as skin. Dermatoscope is provided with ruler markings for measurement of diameter of lesion. These markings will be there in acquired image. The air bubbles and black frame affects the accuracy of segmentation process and further diagnosis of skin cancer. So these artifacts must be removed from image. In some of the cases, contrast between skin and lesion can be very poor. Improved contrast between the lesion and skin improves the accuracy of further diagnosis steps. Melanoma is the most frequent type of skin cancer and its incidence has been rapidly increasing over the last few decades. Never the less, it is also the most treatable kind of skin cancer, if diagnosed at an early stage. The clinical diagnosis of melanoma is commonly based on the ABCD rule, or the 7-points depending on color, shape, and texture.

The hair which is present on skin can be segmented as lesion because of dark pixels being classified as lesion against lighter pixels which will be categorized as skin. Dermatoscope is provided with ruler markings for measurement of diameter of lesion. These markings will be there in acquired image. The air bubbles and black frame affects the accuracy of segmentation process and further diagnosis of skin cancer. So these artifacts must be removed from image. In some of the cases, contrast between skin and lesion can be very poor. Improved contrast between the lesion and skin improves the accuracy of further diagnosis steps.

Melanoma is a condition or a disorder that affects the melanocyte cells thereby impeding the synthesis of melanin. A skin that has inadequate melanin is exposed to the risk of sunburns as well as harmful ultra-violet rays from the sun. skin disorder has been proven to be unpredictable, as it is characterized by development of lesions in the skin that vary in shape, size, color and texture. Researchers have suggested that the use of non-invasive methods in diagnosing melanoma requires extensive training unlike the use of naked eye. For a clinician to be able to analyze and interpret features and patterns derived from dermoscopic images, they must undergo through extensive training.

Clinicians are often discouraged to use the naked eye as it has previously led to wrong diagnoses of melanoma. Scholars encourage clinicians to embrace routinely the use of portable automated real time systems since they are deemed to be very effective in prevention and early detection of melanoma.

MAPSDN-EESC: A MODELING OF AUTHENTICATION PROCESS FOR THE SOFTWARE DEFINED NETWORK USING ENCRYPTED ENTITY SCHEME CRYPTOGRAPHY

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Abstract - The distinguishing characteristics of the SDN provide flexibility to build a robust ubiquitous application but also suffer various security challenges. The effective authentication process provides solutions towards mitigating the adverse effect on network performance and data protection. The typical limitations of the existing systems of authentication are not so scalable due to the higher complexity of flow rule monitoring. The proposed model of the authentication for the SDN uses the mechanism suggested by Trusted Computing Group Specification Architecture and encrypted entity cryptography as an evolution of attributed based encryption. The proposed method MAPSDN-EESC provides lightweight authentication mechanism along with the cross-platform validation of the legitimate user. The proposed method EES reduces the latency by 12.89%, 9.2%, and 4.9% as compared to the existing method of SEND, CGA, and IDS, respectively. The CPU usage reduces by 14.44%, 9.60%, and 4.91% as compared to the existing method of SEND, CGA, and IDS, respectively. The fast authentication delays are lower by 17.44%, 10.44%, and 5.12 % as compared to the existing method of SEND, CGA, and IDS, respectively.

Keywords: Authentication., Attribute-based Encryption., Network security., Software Define Network., Trusted Computing Group Introduction.

1. Introduction

Many of the advances are witnessed in the recent past in the ubiquitous and context-oriented application in various domains of smart and intelligent transport, factory, city, healthcare, etc., systems [1]. These advancements have become possible due to modern technologies of embedded systems, sensors, networks (WSN, IoT, MANET, CRN), and communication standards (4G-LTE, 5G)[2]. The core backbone of the network on which these applications rely on a core network component at the Layer-2(L2) and layer-3(L3) routers and switches capabilities. The inclusion of the software-defined network (SDN) is an advantageous against the traditional components at the L2/L3 because of the distinguishing characteristic of operating in a centralized manner with the partition or isolation of the different planes (such as data plane and the control plane). Due to this separation of the plane, it provides a higher capacity to manage the network traffic more effectively. Another advantage of the inclusion of SDN is the flexible reprogramming, and these characteristics make the SDN based system more flexible and robust [3]. The new layer and architecture of the SDN based application introduce associated vulnerabilities that provide an opportunity to the adversaries to plan attacks to gain the benefit by means of compromising the network operation as well as access to the data, many of such attacks are being reported in the literature[4][5][6].

Unlike the core characteristics of the security protocol designs for any network, even SDN also require to handles issues like authentication, integrity, access control, authorization, and non-repudiation along with proactive and reactive approaches to handle a defined attack pattern [7]. The effective authentication scheme mitigates many of the security challenges as well as complements another security requirement. The strong and effective authentication scheme controls the adversary or the intruder to gain access to the data as well also helps to protect malfunctions on the network operations from the manipulation by the attackers. The biggest vulnerability in SDN is the lack of a strong, consistent, and more effective authentication mechanism so that it can authenticate the stakeholder from the different layers of the network as well as application units. In lack of

A Framework for Identifying and Mitigating Malicious Flow in Software Defined Network Deployed over an IoT Ecosystem

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Abstract - With the rising demand for incorporating smartness over a security operation in networking technologies, Software Defined Network (SDN) has been witnessed to be extensively researched. SDN is one of the integral parts of operation in large scale networking operations e.g., Internet-of-Things (IoT), owing to its highly flexible communication protocols and centralized controlling features. Although there has been an extensive review of literature towards the security aspect of SDN, they do not offer full-fledged solutions especially if the adversary is unknown. Therefore, the proposed manuscript presents a novel framework capable of identifying the degree of severity of the attack from the rate of request message originated from a switch of SDN node and offers a decisive operation of resisting such malicious flows using an auxiliary agent. The auxiliary agent resides in the data plane and works alongside a switch to identify and confirm malicious flow. This information is further updated to the SDN controller, which can further take action that leads to isolating the adversary and allowing only flows with validated legitimacy. The study outcome shows, the proposed system excels better both in security and communication performance.

Keywords: Software Defined Network, Internet-of-Things, Security, Attack, Controller, Switch, Routing Request

1. Introduction

With the advancement of networking technologies, there is also a parallel rise of the adversaries and threats over large scale networks [1]. In order to make the network operate smarter and more efficiently, (SDN) has played a contributory role [2][3]. Being an emerging architecture, SDN offers adaptable and cost-effective features that separate the forwarding plane from the control plane. An SDN architecture is characterized by agility, centrally manageable, direct programmable, support towards open standard, etc. [4]. However, deployment of SDN architecture also invites various threats of various degrees of severity as very often; the attacks and threats are novel forms targeting the SDN controller system. The attacker usually targets the SDN controller node as it retains all sensitive information about the complete network. Therefore, compromising one SDN controller will mean compromising all the nodes that are connected to this SDN controller. There have been various studies being carried out towards securing SDN architecture [5][6], and it has been seen that there are mainly three different security issues that are required to be controlled effectively, e.g., i) offering availability of services hosted by the network, ii) safeguarding the system integrity, and iii) safeguarding the data confidentiality. It is evident that the SDN controller is an integral part of the security system, and it is required to precisely configured them as they can block the routing request as well as a specific route which are found to be vulnerable. It is also required for an SDN controller to carry out sufficient validation with a trusted platform.

There are various forms of attacks and vulnerabilities on the SDN system. From the viewpoint of attacks over data planes, the adversary can illegitimately access the physical medium from the network itself, leading to making the host a victim. Some examples of attacks over data plane in SDN are denial-of-service attack, man-in-middle attack, replay attack, etc. The attacks on the controller system lead to a rogue controller node, which led them to construct forged entries without being tracked by any engineers. There are different layers in SDN, and all of them have a very discrete demand for security. One such security demand is a configuration error. If this problem is not addressed, then it leads to the invitation of different other security threats. Denial-of-Service is one of the frequently reported attacks which use a flooding approach over the switch as well as over the controller, and hence complete layers of SDN will get affected. In the presence of any form of attacks over policy enforcement, the severity of the attack increases multifold over the entire upper three layers of SDN. In the case of authorization-

A Proposed Modern Manufacturing Technique by using Raspberry Pi based Microcontroller System

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Abstract - In the current global scenario, automation manufacturing systems are playing a vital role in global upward demand in a market where flexible production systems could be essential to meet the customer demand by the manufacturing industries. It improves the reliability, repeatability, and accuracy of the output at any given point in time; but is successful only if the whole manufacturing system is designed to take care of variations in the environment. Internet of Things (IoT) helps in bringing a closed-loop monitoring system that monitors the output even outside the production environment and applies corrective measures to bring control over the variations. The monitoring system also can alert the operator on the wrong output and guide him to correct the settings and/or discard the wrong output. The system explained in this refers to a complex component output from a CNC machine and how the closed-loop automation system can support an error-free output, as well as store the parameters of the output in a cloud for tracking. This concept can be applied to any machine/component/production process with a well-defined input-output matrix.

Keywords: Automation, IoT, Closed Loop System, Medium Scale Industries, Production Process

I. INTRODUCTION

Recently, automation in the industry has become more viable with numerous advantages. Also, the automation system drastically reduces the environmental effects and increasing the green manufacturing ratio. Apart from that, Industry 4.0 is growing based on 'intelligent production which mainly focuses on new information technology by recent techniques, independent manufactured goods with decision-making processes [1-4]. The purpose of automation is to replace manual control, planning, and problem-solving by using smart devices and computers. Information techniques related to programmed assignments with appropriate programming and fractional programmed assignments by manual with personal computers develop, manage, and also offer the necessary information.

The usage of this automated technology mainly focuses on factory processing, machinery, communication networks, automatic vehicle controls, aircraft, marines, and so on in which few processes are completely automated.

The tremendous advantage of automation is improved quality, precision, accuracy and also saves labor, energy, and materials [5, 6]. A new prevalence is being realized with the latest developed network technologies and Wireless Sensor Networks (WSN) [7, 8]. There has been huge use of networks and has become an integral part of everyday life which enables networking by modifications on the internetworking technologies. Internet technologies and WSN are all about the Internet of Things (IoT) that brings the contact between machine to machine and person-to-computer communications [9]. After the revolution of mobile usage, the IoT is a recent revolutionary technology of our life in which everyday objects become interconnected and work smart. With the high mobility in the internet and communication technology, the IoT is one of the best solutions to integrate the automation process of the current manufacturing process [10-12].

II. LITERATURE SURVEY

A. Automation in Industries

The main concern of automation is into industries machinery and factory processing because about 33% of total manufacturing cost per unit over its production cycle is mainly expensed for the initial setting up of an automation manufacturing unit. Another crucial fact of additional operating costs is maintenance downtime. If a manufacturing unit has to be efficient for a new addition that is making available by dissimilar manufacturers, then the cost of the initial setup could be significantly increased. The main drawback in the existing technology is the inflexible communication and difficulty in applying the existing application software to a new configuration [13]. This drawback can be overcome by designing ad-hoc systems that can be retrofitted to the existing machines. Though this alternative is a bit expensive, it still saves the original equipment from becoming obsolete. Nowadays, the control of machines is different based on their process, like PLC, etc. are individually programmed for carrying out the numerous commands as process tools. The central system is responsible for the communication between the individual controls in a hierarchical network. This traditional design approach presents a major problem when used as a basis for an intelligent manufacturing control system. Industrial automation system obtained global the





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6.3.2: LIST OF TEACHERS WITH FINANCIAL SUPPORT



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CERTIFICATE OF PARTICIPATION

This is to certify that

Ashwini Hindiholi

City Engineering College, Bangalore

Presented the paper titled

Interdisciplinary Approaches of Physics in Medicine and Biology

at the

ISDSI-Global Conference 2020 : Leading business in a FLUID world

held at **INDIAN INSTITUTE OF MANAGEMENT NAGPUR** from December 23, 2020.

Dr. Arun Elias
Conference Chair

Dr. Ramachandran Natarajan
Conference Chair

Dr. Prakash Awasthy
Conference Chair

Dr. Gunjan Tomer
Conference Chair



IIM NAGPUR



CERTIFICATE OF PARTICIPATION

This is to certify that

Gayathri Annasagaram
City Engineering College, Bangalore

Presented the paper titled

Advancements in Pure and Applied Mathematics

at the

ISDSI-Global Conference 2020 : Leading business in a FLUID world
held at **INDIAN INSTITUTE OF MANAGEMENT NAGPUR** from December 23,2020.

Dr. Arun Elias
Conference Chair

Dr. Ramachandran Natarajan
Conference Chair

Dr. Prakash Awasthy
Conference Chair

Dr. Gunjan Tomer
Conference Chair



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CERTIFICATE OF PARTICIPATION

This is to certify that

Dr. Sujatha

City Engineering College, Bangalore

Presented the paper titled

The Physics of Complexity - Chaos, Networks, and Beyond

at the

ISDSI-Global Conference 2020 : Leading business in a FLUID world
held at **INDIAN INSTITUTE OF MANAGEMENT NAGPUR** from December 23, 2020.

Dr. Arun Elias
Conference Chair

Dr. Ramachandran Natarajan
Conference Chair

Dr. Prakash Awasthy
Conference Chair

Dr. Gunjan Tomer
Conference Chair

Leveraging Deep Learning to Extract Actionable Insights from High-Dimensional Biomedical Data: Opportunities and Challenges

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ABSTRACT: Addressing the challenge of extracting actionable insights from complex, high-dimensional biomedical data is crucial for advancing health care. Modern biomedical research generates a variety of data types, including electronic health records, imaging, -omics, sensor data, and textual information, which are often complex, diverse, poorly annotated, and unstructured. Traditional methods of data mining and statistical learning usually involve feature engineering to create effective and robust features, followed by the development of prediction or clustering models. These processes face significant difficulties due to the complexity of the data and the lack of comprehensive domain knowledge. Recent advancements in deep learning offer promising new approaches for creating end-to-end learning models from such complex data. This article reviews recent literature on the application of deep learning in health care and suggests that these approaches could help translate extensive biomedical data into better health outcomes. However, there are limitations and a need for more refined methods, particularly in terms of making these models more understandable to domain experts and citizen scientists. We discuss these challenges and recommend the development of interpretable architectures that can bridge the gap between deep learning models and human understanding.

KEYWORDS: Deep learning, health care, biomedical informatics, translational bioinformatics, genomics, electronic health records

I. INTRODUCTION

Health care is entering a new era where the growing volume of biomedical data is becoming increasingly significant. For instance, precision medicine aims to deliver tailored treatments to individual patients by integrating various data sources such as molecular traits, environmental factors, electronic health records (EHRs), and lifestyle information.

The vast amount of biomedical data presents both opportunities and challenges for health care research. Understanding the relationships between different data components is essential for developing reliable, data-driven medical tools. Previous efforts have focused on linking multiple data sources to create comprehensive knowledge bases for predictive analysis and discovery. Despite promising results from existing models, the adoption of machine learning tools in medicine remains limited. The high-dimensionality, heterogeneity, temporal variability, sparsity, and irregularity of biomedical data present significant challenges. These issues are further complicated by inconsistencies and conflicts among various medical ontologies, such as SNOMED-CT, UMLS, and ICD-9. Additionally, clinical phenotypes can be represented in multiple ways, complicating efforts to standardize and understand these concepts. Traditionally, domain experts manually define phenotypes, which is labour-intensive and may overlook novel patterns. Representation learning methods offer an alternative by automatically discovering the necessary features for prediction from raw data. Deep learning, a subset of representation learning, employs multiple layers of non-linear transformations to derive increasingly abstract representations from raw input. Deep learning has shown impressive results in fields like computer vision, speech recognition, and natural language processing.

Given its success in various domains and ongoing methodological advancements, deep learning holds significant promise for biomedical informatics. Initiatives are already underway to apply deep learning in health care, such as Google DeepMind's plans and Enlitic's use of deep learning for analyzing X-rays and CT scans.

However, deep learning has not yet been extensively tested across the wide range of medical problems that could benefit from its capabilities. The field must address several challenges related to the unique characteristics of health care data,

Enhancing Credit Card Fraud Detection using Machine Learning and Blockchain: A Novel Approach with Anomaly Detection and Deep Learning Techniques

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ABSTRACT: Credit card fraud represents a major obstacle for financial institutions and consumers globally. Traditional methods of fraud detection frequently struggle to keep pace with the increasingly sophisticated nature of fraudulent activities. This research introduces a novel strategy that leverages cutting-edge machine learning (ML) techniques and blockchain technology to improve the capabilities of fraud detection. The study analyzes a comprehensive dataset that includes a wide range of transactional features, such as transaction amount, location, and time. Several ML models are utilized, including anomaly detection, supervised learning approaches (Random Forest and Gradient Boosting with ensemble methods), and deep learning techniques (custom Recurrent Neural Networks in conjunction with xgboost). Initial experiments yield encouraging accuracy results, with anomaly detection achieving nearly 99.9% accuracy, 99.8% recall, 99.9% sensitivity, and an F1 score of 99.9% in fraud identification.

KEYWORDS: Transactions, unified, unchangeable, precision, distributed

I. INTRODUCTION

The rise of digital commerce has significantly changed the landscape of financial transactions, providing unparalleled convenience. However, this swift move toward digitization has also created an environment conducive to fraudulent activities, with credit card fraud representing a major risk for both consumers and financial institutions. To address this growing issue, advanced fraud detection systems are essential.

In traditional credit card transactions, a complex relationship exists among cardholders, merchants, and financial institutions. Each transaction creates a set of data, which includes transaction amount, location, time, and cardholder information. By scrutinizing these data points, institutions can uncover patterns that suggest fraudulent behavior. Nonetheless, the continuously evolving tactics of fraud require the adoption of more sophisticated strategies. Blockchain technology, known for its characteristics of immutability, transparency, and decentralization, presents a promising option for improving fraud detection mechanisms. By fusing the inventive potential of block chain technology with conventional machine learning approaches, this research seeks to create a reliable credit card fraud detection system. We aim to develop a model that can reliably detect fraudulent transactions, minimize financial losses, and preserve consumer confidence by utilizing the advantages of both approaches. A crucial field of study has been credit card fraud detection (CCFD) because of the growth in fraudulent activity and the number of financial transactions. Technological developments such as blockchain, machine learning, and federated learning have created new opportunities to enhance the efficacy and precision of fraud detection systems. The important research contributions in this field are examined in this overview of the literature, with an emphasis on the datasets utilized, the techniques, the main conclusions, and performance metrics like accuracy and F1 score.

II. LITERATURE REVIEW

Recent developments in machine learning, blockchain, and federated learning have created new opportunities to boost the efficacy and accuracy of credit card fraud detection (CCFD) systems. The important research contributions in this field are examined in this overview of the literature, with an emphasis on the datasets utilized, the techniques, the main conclusions, and performance metrics like accuracy and F1 score. This paper, written by Pushpita Chatterjee, Debashis Das, and Danda Rawat, examines how federated learning and blockchain technology might be combined to improve the security and precision of fraud detection systems using a private credit card transaction dataset. These two technologies are combined by the approach to produce The key findings of this robust fraud detection framework reveal that the integrated approach markedly enhances detection accuracy while safeguarding user privacy. The reported performance metrics are an accuracy of 95.3% and an F1 score of 94.8%. In the research conducted by Baabdullah, Tahani;



A Conceptual Framework for Understanding Machine Learning and Artificial Intelligence Roles in Technological Advancements

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ABSTRACT: In recent years, the terms "machine learning" and "artificial intelligence" have become increasingly prevalent across both scientific literature and media outlets, often used interchangeably despite their distinct meanings. This study aims to clarify the relationship between these two concepts, with a particular focus on the role machine learning plays in the development of artificial intelligence. By reviewing relevant literature, we identify key distinctions between the two fields and explore how machine learning serves as a subset of artificial intelligence, providing the foundational algorithms that enable intelligent decision-making and autonomous behaviour in artificial agents. Additionally, we introduce a conceptual framework to provide a clearer understanding of how machine learning techniques, such as supervised learning, unsupervised learning, and reinforcement learning, contribute to the broader goals of artificial intelligence. This framework is intended to serve as a foundation for interdisciplinary discussions and guide future research by offering precise definitions and a more structured understanding of the intersection between these fields. Ultimately, this work seeks to foster a better comprehension of the roles that machine learning and artificial intelligence play in modern technological advancements and how they can be distinguished in both academic and practical applications.

KEYWORDS: Machine Learning, Artificial Intelligence, Conceptual Framework, Interdisciplinary Research

I. INTRODUCTION

In his April 2018 US Senate hearing, Mark Zuckerberg emphasized the need for Facebook's "AI tools" to effectively identify hate speech and terrorist propaganda. Typically, such tasks are categorized as classification tasks within the realm of (supervised) machine learning. However, with the growing popularity of artificial intelligence (AI), the term AI is frequently used interchangeably with machine learning. This usage is not only seen in Zuckerberg's statements and interviews but also across various theoretical and application-oriented contributions in recent literature. Carner (2017) even acknowledges using AI as a synonym for machine learning, despite knowing this is not entirely accurate. This ambiguity can lead to significant imprecision in both research and practice when discussing methods, concepts, and results. It is surprising that despite the frequent use of these terms, there is a lack of clear scientific delineation. This paper aims to clarify the relationship between machine learning and artificial intelligence by examining the role of machine learning in the context of intelligent agents. We approach this by focusing on the machine learning perspective of intelligent agent capabilities and their implementation.

Our contribution is threefold. First, we build on the theoretical framework provided by Russel & Norvig (2015) by refining the "thinking" layer of intelligent agents into distinct "learning" and "executing" sublayers. Second, we demonstrate how this distinction allows us to better understand the various contributions of machine learning to intelligent agents. Third, we use the implementation of these sublayers ("backend") to define a continuum between human involvement and agent autonomy. The paper proceeds by reviewing relevant literature on machine learning and artificial intelligence, presenting and elaborating on our conceptual framework that highlights the contribution of machine learning to AI. We then outline an agenda for future research and conclude with a summary, current limitations, and future outlook.



Autonomous Machine-to-Machine (M2m) Collaboration for Indoor Search and Rescue Missions: A Multimodal Approach using Ground Vehicles and Drones

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ABSTRACT: Machine-to-Machine (M2M) collaboration has unlocked new possibilities for systems to autonomously and efficiently solve complex technical challenges. In recent years, M2M applications have expanded across various industries, particularly in areas where autonomous decision-making and real-time collaboration are crucial. This research project presents the development of an M2M system that enables autonomous collaboration between two ground vehicles and a drone, managed by a central base station. The system is designed specifically for indoor search and rescue operations, where traditional human intervention may be challenging or hazardous. The primary function of the drone in this system is to perform an autonomous aerial search, while the ground vehicles handle obstacle navigation and ground-level data collection. The base station serves as the control hub, managing both the drone's flight path and the vehicles' navigation, ensuring real-time coordination. A machine learning model is employed to optimize the drone's flight path, achieving near-perfect accuracy in navigating the indoor environment. This accuracy improves significantly with an increase in training data, highlighting the importance of robust training in machine learning-based navigation systems. For ground vehicles, machine learning models are also implemented to navigate complex environments with obstacles. During field testing, the integrated system demonstrated high levels of accuracy and efficiency in coordinating tasks between the drone and ground vehicles. This successful implementation of M2M collaboration showcases its potential in critical applications like search and rescue, offering a glimpse into future advancements in autonomous systems for emergency response operations. The project's findings underscore the growing importance of M2M technology in enhancing the effectiveness of autonomous systems across various domains.

KEYWORDS: Search and Rescue, Image Processing, Navigation Systems, Autonomous Systems, and Object Detection

I. INTRODUCTION

Machine-to-machine (M2M) collaboration became possible with the introduction of Cyber-Physical Systems (CPS) and the Internet of Things (IoT), together with significant advancements in networking, cloud computing, and machine learning. Road transportation, system automation, surveillance, search and rescue operations, and many other situations make use of the idea of M2M collaboration. The Internet of Things (IoT) offers a network of items with integrated sensors, software, and other technology designed to link and exchange data with other systems and devices. Machine learning is one of the key components of M2M collaboration. Researchers have used machine learning for a variety of purposes in a number of efforts. In one project, Chirra and his colleagues used face state observation to apply a behavioral technique to identify driver fatigue. In order to ascertain whether or not the driver is sleepy, it used the Viola-Jones identification algorithm to identify the face and extract the eye region from the facial image. To determine whether the driver is asleep or not, a Convolutional Neural Network (CNN) classifier employs a SoftMax layer. Better accuracy was reported by this work as compared to conventional CNN. Munawar and associates devised a categorization scheme for flooding management to organize the several technologies under examination [5]. They discovered that there were not many hybrid models—which fuse machine learning and image processing—for flood control. Furthermore, it was discovered that there was little use of machine learning-based techniques in the aftermath of a disaster. Therefore, to enable efficient and comprehensive catastrophe management throughout all phases, future efforts must concentrate on integrating disaster management expertise, image processing techniques, and machine learning tools.

Semeraro and colleagues provided a survey of the literature on machine-learning approaches used in human-robot collaboration. In order to do work grouping based on the kinds of collaborative activities, evaluation measures, and



Portfolio Selection Method based on Pattern Matching with Dual Information of Direction and Distance: A Comprehensive Analysis of Online Portfolio Strategies

Gayatri Annasagaram¹, Vanitha G R², Nagendra Naik K³, Rekha R⁴, Jyothi⁵

Assistant Professors, Department of Mathematics, City Engineering College, Bengaluru, Karnataka, India^{1,2,3,4,5}

ABSTRACT: The pattern matching method has long been recognized as a traditional and effective classification approach within the domain of online portfolio selection strategies. This article delves into the core elements of this method, focusing on two key components: the assessment of similarity and the selection of similarity sets. To address the growing complexity of financial markets, this study introduces an enhanced approach known as the Portfolio Selection Method based on Pattern Matching with Dual Information of Direction and Distance (PMDI). The aim is to optimize portfolio selection by integrating a more comprehensive analysis of historical stock price patterns. PMDI leverages a dual-information framework, combining both direction and distance metrics to create a more accurate and refined pattern-matching process. The method incorporates various well-known techniques, such as the Euclidean distance, Chebyshev distance, and the correlation coefficient, to capture the essential information embedded in historical stock price movements. By analyzing both the directional trends (the way prices move over time) and the relative distances between stock prices, PMDI identifies a similarity set that closely mirrors the desired investment strategy. This similarity set forms the foundation of the portfolio selection algorithm. The novelty of PMDI lies in its ability to not only assess patterns based on price direction but also to quantify how far stock prices deviate from one another. This dual approach enhances the system's capability to filter out noise and irrelevant data, thereby selecting only the most relevant patterns for further processing. As a result, the system can make more informed decisions when constructing an optimal investment portfolio, balancing between maximizing returns and minimizing risks. To validate the effectiveness of PMDI, extensive experiments were carried out using two real-world stock market datasets. The results of these tests demonstrated that PMDI outperformed other traditional algorithms, achieving a superior balance between returns and risk management. In comparison to single-metric models, which may focus only on direction or distance, PMDI's dual-information framework proves to be more robust and adaptable to the ever-changing dynamics of financial markets. In the increasingly volatile world of finance, having a strategy that can dynamically respond to market shifts is crucial. The PMDI method offers a significant improvement over existing portfolio selection techniques by utilizing a richer set of data inputs. Its ability to handle both directional trends and price deviations makes it particularly well-suited for real-world financial environments, where adaptability and precision are key to achieving sustainable long-term returns. As financial markets evolve, methods like PMDI will likely become essential tools for investors seeking to maximize performance while effectively managing risk.

KEYWORDS: Portfolio Selection, Pattern Matching, Dual Information, Financial Markets, Risk Management

I. INTRODUCTION

The allocation of limited capital in global financial markets has consistently garnered significant interest from both investors and researchers, particularly in the quest to optimize returns. The intricate nature and high interconnectivity of these markets complicate the ability to forecast market movements. Additionally, elements such as financial innovation, diverse trading strategies, and regulatory frameworks contribute to the prevailing uncertainty within the market. Consequently, devising effective capital allocation strategies within this multifaceted environment has emerged as a pressing global issue. Portfolio Selection (PS) stands as a fundamental endeavour within the financial sector, focusing on the distribution of capital across a defined array of assets to meet specific investment objectives. The roots of this challenge can be traced back to the mean-variance theory introduced by Markowitz in 1952, which employs mean-variance analysis to identify the optimal investment portfolio by balancing anticipated returns against associated risks. Nevertheless, as market dynamics evolve and investor preferences diversify, conventional portfolio selection techniques have increasingly revealed their shortcomings.

In recent years, the swift advancement of artificial intelligence and machine learning has introduced innovative approaches to address portfolio selection challenges. These technologies possess the capability to scrutinize historical data, uncovering patterns and trends that facilitate more accurate predictions of future market behaviour. By processing



Discovering Spatial Correlations through Spatial Data Mining: A Framework for Geospatial Data Analytics

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ABSTRACT: Spatial data holds immense potential for uncovering geographical correlations, which can provide valuable insights into patterns across various fields such as urban planning, environmental monitoring, and social media analysis. Spatial Data Mining (SDM) offers powerful methods for analyzing these correlations, and this paper introduces a novel approach to enhance this analytical process. Specifically, we propose a framework for geospatial data analytics that integrates the G statistic and ZG score computations for spatial correlation discovery. The proposed algorithm, Spatial Data Mining for Spatial Correlations Discovery (SDM-SCD), is designed to perform comprehensive spatial correlation analysis while also incorporating Principal Component Analysis (PCA) to uncover trends and reduce dimensionality. By applying SDM-SCD to Twitter data, we demonstrate how spatial correlations can be effectively analyzed based on the origin location of tweets and specific keywords. The analysis process begins by collecting geolocated Twitter data based on a set of predefined keywords. The algorithm then computes the G statistic and ZG score to detect significant spatial correlations between different geographic regions. These correlations are mapped and analyzed to identify hotspots, clusters, or patterns of interest. By applying PCA, the algorithm reduces the complexity of the data while retaining the most relevant components, enabling more efficient trend identification and visualization. Our experimental results demonstrate that the SDM-SCD framework effectively identifies spatial correlations in Twitter data, providing meaningful insights into how topics or trends evolve across geographical regions. For instance, the algorithm can reveal the spatial spread of discussions related to public health, natural disasters, or political events, offering valuable real-time insights for decision-makers. The SDM-SCD algorithm and framework provide a robust approach for geospatial data analysis, with the ability to uncover spatial patterns and trends from large-scale social media data. By leveraging the power of spatial data mining and advanced statistical techniques, this framework opens new avenues for exploring spatial correlations in various fields, with potential applications in social media analytics, public health, and beyond. The experimental validation highlights its efficacy in providing actionable insights from geospatial data.

KEYWORDS: Spatial Data Mining, Geospatial Data Analysis, G Statistic, ZG Score Computations, Spatial Correlation Analysis

I. INTRODUCTION

Spatial data analysis has become a crucial research area in the modern era. It has diverse applications such as traffic forecasting, weather updates, and more. Spatial data often includes non-spatial observations that play a significant role in knowledge discovery. Various techniques are discussed. Qinjun et al. proposed a text mining approach coupled with spatial data processing for generating spatial analysis results in geoscience reports. Senzhang et al. utilized deep learning to discover spatial features from datasets. Maria et al. applied various techniques to big spatial data for emergency management in business systems. Wesley analyzed climate data and the associated challenges. Fernandez et al. investigated SDM for situational analysis in maritime contexts. The literature reveals many techniques for spatial data analysis, considering the temporal domain as well. This paper sheds light on spatial correlation discovery using geographical datasets and specific keywords. Our contributions are as follows:

- We proposed a framework focused on discovering spatial correlations based on G statistic and ZG score computations.
- We developed an algorithm known as Spatial Data Mining for Spatial Correlations Discovery (SDM-SCD).



Predicting Bitcoin Prices using Machine Learning: A Comparative Analysis of Algorithms and Feature Engineering Techniques

Chandranaik G¹, Nanditha H G², Aurbindo Koti³, Shalini Prasad⁴, Sheetal Patted⁵

Assistant Professors, Department of Electronics and Communication Engineering, City Engineering College,
Bengaluru, Karnataka, India^{1,2,3,4,5}

ABSTRACT: A lot of attention has been paid to cryptocurrency price prediction as digital assets become more and more important in the financial system. This paper provides a thorough analysis of the use of machine learning algorithms in bit coin price prediction. Historical open-source data from multiple bit coin exchanges is used. To deal with missing data, interpolation techniques are used, guaranteeing the dataset's trustworthiness and completeness. Four technical indicators have been chosen as prediction features. The study looks at how five machine learning algorithms might be used to identify intricate patterns in the wildly unstable bit coin market. The results show the benefits and drawbacks of the various strategies, emphasizing the role that feature engineering and algorithm selection play in producing reliable predictions of bit coin prices. As digital assets like cryptocurrencies become increasingly integrated into the financial system, predicting their prices has garnered significant attention from traders, investors, and researchers. This paper focuses on the application of machine learning algorithms to predict Bitcoin prices, a highly volatile and unpredictable market. By leveraging historical data from various Bitcoin exchanges, the study ensures data integrity by employing interpolation techniques to handle missing values, resulting in a trustworthy and complete dataset for analysis. The research explores the use of four key technical indicators as predictive features, carefully selected based on their relevance to cryptocurrency markets. These features serve as inputs to five different machine learning algorithms, which are employed to uncover complex patterns and relationships within the Bitcoin market. The paper offers a comparative analysis of these algorithms, examining their strengths and weaknesses in predicting Bitcoin prices under volatile market conditions. A key focus of the study is on the importance of feature engineering and algorithm selection in achieving accurate and reliable predictions. The results demonstrate that certain algorithms outperform others in terms of prediction accuracy, while highlighting the critical role that feature engineering plays in enhancing model performance. The insights from this study provide valuable guidance for traders and investors navigating the rapidly evolving world of cryptocurrency markets, offering a practical framework for using machine learning to improve prediction accuracy in financial decision-making.

KEYWORDS: Cryptocurrency Price Prediction, Machine Learning Algorithms, Feature Engineering, Performance Metrics globally

I. INTRODUCTION

The financial system is seeing a shift due to cryptocurrencies, which are bringing decentralized digital assets based on block chain technology. The original cryptocurrency, Bitcoin, is driving a global wave of digital currencies that are giving rise to a plethora of substitute cryptocurrencies, or altcoins. The increasing prevalence of cryptocurrencies is garnering substantial interest from traders, investors, and financial establishments. In the meantime, cryptocurrencies are becoming a more attractive and fascinating asset class due to its decentralized structure, possibility for large profits, and distinct market dynamics. The bit coin sector is becoming more and more legitimate as a result of mainstream organizations and businesses adopting cryptocurrencies. Furthermore, as governments are looking at digital alternatives to their fiat currencies, the development of digital currencies issued by central banks is a big step forward. Sustainability issues, interoperability across many block chain networks, and industry's progress is also being shaped by regulatory frameworks, but investors looking to take advantage of market opportunities face significant obstacles due to the tremendous volatility and unpredictability of bit coin values. Therefore, there is a strong need for reliable and accurate predictive models to help investors make wise decisions in this quickly changing financial environment.

The investigation of novel techniques to predict future price movements is driven by the intrinsic complexity and volatility of cryptocurrency markets. The distinctive qualities of cryptocurrencies are frequently difficult for traditional financial models to represent, which leads researchers to consider machine learning algorithms as a possible remedy.

Designing a Scalable Cloud-based ETL Framework for Big Data Aggregation and Feature Engineering

Archana Bhat¹, Laxmi M C², Sriraksha S³, Sreevidya G⁴, Harish R⁵

Assistant Professors, Department of Computer Science and Engineering, City Engineering College, Bengaluru, Karnataka, India^{1,2,3,4,5}

ABSTRACT: The success of businesses largely hinges on their ability to effectively analyze data and derive actionable insights. The Extract-Transform-Load (ETL) process plays a crucial role in achieving these objectives, but it demands considerable effort, particularly when dealing with Big Data. Previous research has struggled to formalize, integrate, and assess the ETL process for Big Data challenges in a scalable and cost-efficient manner. In this paper, we introduce a cloud-based ETL framework designed for the fusion and aggregation of data from various sources. We then outline three scenarios for data aggregation during the ETL process: (i) ETL without aggregation; (ii) aggregation based on specified columns or time intervals; and (iii) aggregation within individual user sessions over varying time frames. The third scenario is particularly beneficial for feature engineering, enabling the definition of features such as “the time since the last occurrence of event X.” We assessed the scalability of our framework using Amazon AWS Hadoop clusters.

KEYWORDS: ETL (Extract-Transform-Load), Big Data, Cloud Computing, Data Aggregation, Feature Engineering

I. INTRODUCTION

The prevalence of smart devices, sensors, and social media has resulted in massive amounts of data being generated. Concurrently, consumers have become accustomed to receiving personalized services instantly. Numerous companies, healthcare providers, and institutions have dedicated substantial resources to meet this demand. In the era defined by Big Data, organizations are increasingly under pressure to store and analyze all collected data to maintain a competitive edge in the data-driven market. The intrinsic characteristics of Big Data include volume, velocity, and variety. Recently, other aspects such as variability, veracity, visualization, and value have been recognized as equally important. Together, these elements represent the 7 Vs of Big Data, highlighting the significant complexity faced by those who seek to process, analyze, and leverage this information. Additionally, companies encounter challenges with data analysis outcomes such as joins, transformations, and aggregations—as well as the integration of data with other system components.

To present the data in a practical format, several essential steps must be undertaken [5, 6]: conducting analyses and modeling to uncover all relationships and the relevant business context; gathering data; and performing Extract-Transform-Load (ETL) processes, which typically involve lengthy development and execution phases. After the data is processed and integrated into a data warehouse, it should be accessible for reporting, visualization, analytics, and decision support purposes [1]. According to [7], data warehousing (DW) and business intelligence (BI) face numerous challenges regarding Big Data, including issues related to size, complexity, design and data modeling, computing methodologies, query languages, usability, end-user performance, data consistency and lineage, as well as adapting traditional tools for data exploration, visualization, and analytics and their integration into existing DW/BI solutions and platforms. As proposed in [7], future research directions concerning DW and OLAP in the context of Big Data should strive to provide se...

The usability of data throughout various processing stages is closely linked to its consistency, which presents substantial challenges within Big Data systems. Adopting strong consistency models can severely hinder the scalability and performance of these systems. Conversely, weak and eventual consistency models allow for greater availability and reduced latencies, but they may notably detract from the quality of the information obtained and diminish its usability. In the context of cloud computing, which has become a key paradigm offering a range of cost-effective hardware and software solutions well-suited for deploying Big Data systems, new challenges also arise. These include architectural



Real - Time Emotion Recognition using Spiking Neural Networks on Wearable Edge Devices

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Professor, Department of Computer Science and Engineering, City Engineering College, Bengaluru, Karnataka, India⁴

ABSTRACT: Real-time emotion recognition through facial expressions offers significant potential for improving human-computer interactions and personalizing user experiences. This research introduces a novel approach using Spiking Neural Networks (SNN) on wearable edge devices to achieve this. The approach incorporates key technologies like Open Neural Network Exchange (ONNX), Message Queuing Telemetry Transport (MQTT), and Long Short-Term Memory (LSTM) networks to boost the efficiency and accuracy of emotion recognition systems in real-world scenarios. ONNX enables seamless model interchange and deployment across various hardware platforms, ensuring scalability and flexibility. The optimized model conversion for wearable edge devices enhances interoperability and efficiency in real-time emotion recognition. MQTT acts as a lightweight, reliable protocol for smooth data exchange between wearable devices and external systems, facilitating real-time transmission of facial expression data and inference results. This setup supports collaborative processing and decision-making across distributed networks, improving system responsiveness and scalability. Additionally, the use of LSTM networks helps capture temporal dependencies in facial expressions, enhancing the accuracy and robustness of emotion recognition systems by effectively modeling sequential data and long-term dependencies.

KEYWORDS: Spiking Neural Networks (SNNs), Open Neural Network Exchange (ONNX), Long Short-Term Memory (LSTM), and Message Queuing Telemetry Transport (MQTT)

I. INTRODUCTION

Emotion recognition from facial expressions is an intriguing area with applications ranging from human-computer interaction to mental health monitoring. With the advent of wearable technology and the increasing need for real-time processing, there is a growing interest in using advanced neural network architectures, such as SNNs, to perform emotion recognition tasks directly on wearable edge devices. This integration holds the potential to enhance both accuracy and efficiency, providing seamless and personalized user experiences across various domains. The use of Field Programmable Gate Arrays (FPGA) and Application-Specific Integrated Circuits (ASIC) play a crucial role in enhancing the performance and efficiency of real-time emotion recognition systems based on SNN. These hardware platforms provide customizable and parallel processing capabilities, making them ideal for implementing complex neural network architectures optimized for low-latency inference on edge devices. By utilizing the inherent parallelism and reconfigure ability of FPGA and the specialized hardware design of ASIC, researchers and developers can create and deploy efficient SNN-based emotion recognition systems that meet the stringent requirements of real-time processing. Additionally, the adoption of standardized formats like ONNX enables seamless model deployment and interoperability across various hardware platforms and software frameworks. ONNX facilitates the conversion and exchange of trained neural network models between different deep learning frameworks, allowing developers to leverage pre-trained models and optimize them for deployment on FPGA and ASIC-based edge devices.

The protocols such as MQTT are essential for enabling seamless interaction between wearable edge devices and external systems. MQTT provides lightweight and reliable messaging communication suited for resource-constrained environments, enabling real-time data exchange between edge devices and cloud servers or other edge devices. By using MQTT for data transmission, SNN-based emotion recognition systems can integrate smoothly with existing infrastructure and enable collaborative processing and decision-making across distributed networks. Additionally, advanced neural network architectures such as LSTM and Temporal Convolutional Neural Networks (TCNN) offer complementary capabilities for capturing temporal dependencies and spatial features in facial expressions, improving the accuracy and robustness of emotion recognition systems. LSTM networks are adept at modeling sequential data and capturing long-term dependencies, making them suitable for analysing temporal patterns in facial expressions over



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6.3.2: SUPPORTING DOCUMENTS



CITY
ENGINEERING COLLEGE

Department of Computer Science & Engineering

Date: 13/10/2021

From,

Dr. Sowmya
Dept. of CSE
CEC, B'lore-62

To,

The Principal,
City Engineering College,
Doddakallasandra,
Bangalore-560062

Through,

HOD
Dept. of CSE

Dear Sir,

Subject: Publication in IJIRSET August 2020.

I have published a paper IJIRSET in the month of August 2020.

I request you to provide financial assistance which was paid by me for the same.

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Doddakallasandra Off Kanakapura Road
Bangalore 560061

Your's Sincerely

[Reimbursed]



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Doddakallasandra, Off. Kanakapura Road, Bangalore - 560 061.

DEBIT VOUCHER

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Date : 02/11/2021

Debit Head Faculty development

Paid to M/s. / Smt. Sri Dr. Sowmya

Rupees (in words) Five thousand only

Towards International conference at IIRCT

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Rs. 5000/-

TDS

Dr. Sowmya

[Signature]

Prepared by *[Signature]*

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R.S. BANDE
A.O.

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Kanakapura Main Road, BANGALORE

Receiver's Signature
Mob No.



CITY
ENGINEERING COLLEGE

Department of Electronics & Communication

Date: 5/10/2021

From,

Dr. Ravindra S.
Dept. of EC,
CEC, Bellur - 62.

To,

The Principal,
City Engineering College,
Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of E&C.

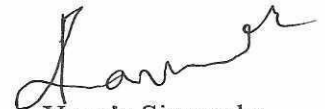
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Professor & Head
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Communication Engineering
City Engineering College,
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Bangalore-560 062.

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Voucher No. 03

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Debit Head Faculty Development

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Rupees (in words) Five thousand Only

Towards International Conference at ITCSE

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Prepared by

Checked by
K.S. HANDE
A.O

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CITY ENGINEERING COLLEGE
Sanctioned by
Kanakapura Road
BANGALORE - 560 061
Receiver's Signature
Mob No.

Ravindra S.D



CITY
ENGINEERING COLLEGE

Department of Electronics & Communication

Date: 08/10/2021

From,

Dr. Ravindra S.
Dept. of EC,
CEC, B'lore - 62

To,

The Principal,
City Engineering College,
Doddakallasandra,
Bangalore-560062

Through,

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Dept. of E&C

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Subject: Publication in IJCSE October 2020.

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City Engineering College,
Doddakallasandra, Karakpura Main Road
Bangalore-560 061.

Ravindra - S.D -

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Towards International Conference at TICSE

By Cash / Cheque No. 5000/- Dated 02/11/2021 Bank _____

Rs. 5000/-

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[Handwritten Signature]

[Handwritten Signature]
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PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Road, Bangalore - 560 061

[Handwritten Signature]
Receiver's Signature
Mob No.



CITY
ENGINEERING COLLEGE

Department of Electronics & Communication

Date: 10/10/2021

From,

Dr. Shalini Prasad,
Dept. of EC,
C.E.C., B'lore-62

To,

The Principal,
City Engineering College,
Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of E&C

Dear Sir,

Subject: Publication in IJETT May 2021.

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S. Prasad
Your's Sincerely

C.S. Malikarjuna
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Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 061.

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Date : 02/11/2021

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Towards International Conference at TIETT

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Rs. 5000/-

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[Handwritten Signature]
Receiver's Signature
Mob No.

[Handwritten Signature]
Prepared by

[Handwritten Signature]
Checked by
K.S. HANDE

Sanctioned by



CITY
ENGINEERING COLLEGE

Department of Applied Science and Humanities.

Date: 31/10/2020

From,

Ashwini Hendeholi
Dept of AS&H
Blor- 560062.

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of AS & H

Dear Sir/Madam

Subject: To Participate in "ISDSI-Global Conference 2020".

As I wish to participate in the "International conference on ISDSI Global Conference 2020 being organized on December 2020. I request you to grant permission and provide financial support to me.

Thanking You


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Your's Sincerely



HEAD OF THE DEPT. OF APPLIED SCIENCE AND HUMANITIES
CITY ENGINEERING COLLEGE
DODDAKALLASANDRA
BANGALORE - 560062



CITY ENGINEERING COLLEGE

JAYANAGAR EDUCATION SOCIETY (R)

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DEBIT VOUCHER

Date : 03/11/2020

Voucher No. 6

Debit Head Conference.

Paid to M/s. / Smt. Sri Ashwini Hendiholi

Rupees (in words) Five thousand rupees only

Towards ISDSI - Global conference 2020

By Cash / Cheque No. 5000/- Dated 03/11/20 Bank _____

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Prepared by 19

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Ramawati
Sanctioned by
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore
560 061

Ashwini
Receiver's Signature
Mob No.



CITY
ENGINEERING COLLEGE

Department of Applied Science and Humanities.

Date: 31/10/2020

From,

Gayathri Annasagaram
From. Dept of AS & H
Bglre - 560062

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of AS & H

Dear Sir/Madam

Subject: To Participate in "ISDSI-Global Conference 2020".

As I wish to participate in the "International conference on ISDSI Global Conference 2020 being organized on December 2020. I request you to grant permission and provide financial support to me.

Thanking You

Jyoti
Seal and Signature of HOD

Your's Sincerely

GJA

HOD Department of Mathematics
City Engineering College
Doddakallasandra, Bangalore-62



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Date : 03/11/2020

Voucher No. 7

Debit Head Conference

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Rs. 5000/-

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Checked by [Signature]

Ramesh
CITY ENGINEERING COLLEGE
Sanctioned by
Kanakapura Main Road, BANGALORE - 560 061.

Receiver's Signature G.A.
Mob No. _____



CITY
ENGINEERING COLLEGE

Department of Applied Science and Humanities.

Date: 31/10/2020

From,

Dr. Sujatha
Dept of AS & H
Bglre - 560062.

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,
HOD,
Dept. of AS & H

Dear Sir/Madam

Subject: To Participate in "ISDSI-Global Conference 2020".

As I wish to participate in the "International conference on ISDSI Global Conference 2020 being organized on December 2020. I request you to grant permission and provide financial support to me.

Thanking You

Dr. S

Seal and Signature of HOD

Dr. S
Your's Sincerely

HEAD OF THE DEPT. OF AS & H
CITY ENGINEERING COLLEGE,
DODDAKALLASANDRA, Doddakallasandra Main Road,
BANGALORE - 560 062.



CITY ENGINEERING COLLEGE

JAYANAGAR EDUCATION SOCIETY (R)

Doddakallasandra, Off. Kanakapura Road, Bangalore - 560 061.

DEBIT VOUCHER

Voucher No. 8

Date : 03/11/2020

Debit Head

Conference

Paid to M/s. / Smt. Sri

Dr. Sujatha

Rupees (in words)

(5000) five thousand rupees only

Towards

ISDSI - Global Conference 2020

By Cash / Cheque No.

5000/-

Dated

3/11/20

Bank

Rs.

5000/-

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Checked by
F. K. S. H. S. K.

Sanctioned by

CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

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Mob No.



CITY
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Department of Computer Science and Engineering

Date: 1/4/2021

From,

Srisaksha S

DEPT of CSE

Blore -62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of CSE

Dear Sir,

Subject: Journal Publication in IJARETY

As I wish to publish a paper in the "International Journal of advanced Research in Computer and Communication Engineering and (IJARETY)". I request you to grant permission and provide financial support to me.

Thanking You

Seal and Signature of HOD

HOD

Dept of Computer Science & Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra Off Kanakapura Road
Bangalore 560061

Your's Sincerely



CITY ENGINEERING COLLEGE

JAYANAGAR EDUCATION SOCIETY (R)

Doddakallasandra, Off. Kanakapura Road, Bangalore - 560 061.

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CITY
ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

Date: 3/5/2021

From,

Madhavi S Kulkarni
Dept of ECE
Block 62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of ECE

Dear Sir,

Subject: Journal Publication in IJIRCCE

As I wish to publish a paper in the "International Journal of Advanced Research in Computer and Communication Engineering (IJIRCCE)". I request you to grant permission and provide financial support to me.

Thanking You

isb
Your's Sincerely

P.S. Maluraj
Seal and Signature of HOD
Professor & Head

Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Doddakallasandra Main Road
Bangalore-560062



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CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

Date:

From,

Gopikishan J
Dept of ECE
Block - 62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of ECE

Dear Sir,

Subject: Journal Publication in IJAREEIE

As I wish to publish a paper in the "International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE)". I request you to grant permission and provide financial support to me.

Thanking You

Gopikishan J
Yours Sincerely


Seal and Signature of HOD
Professor & Head

Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 061.



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Mob No.

CITY ENGINEERING COLLEGE

Kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

Department of Mechanical Engineering

Date: 6/4/2021

From,

Harshavardhan U
Dept of Mech
Block - 62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,


HOD,
Dept. of Mech


Dear Sir,

Subject: Journal Publication in IJMRSET

As I wish to publish a paper in the "International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)". I request you to grant permission and provide financial support to me.

Thanking You


Your's Sincerely


Seal and Signature of HOD
HEAD OF THE DEPARTMENT
Mechanical Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560062



CITY ENGINEERING COLLEGE

JAYANAGAR EDUCATION SOCIETY (R)

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Date : 8/4/21

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Mob No.

CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

Department of Applied Science and Humanities

Date: 9/4/2021

From,

Dr Jyothi P
Dept of AS & H
Bangalore-62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of AS & H


Dear Sir,

Subject: Journal Publication in IJIRSET

As I wish to publish a paper in the "International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET)". I request you to grant permission and provide financial support to me.

Thanking You

Your's Sincerely


Seal and Signature of HOD



HOD Department of Mathematics
City Engineering College
Doddakallasandra, Bangalore-62



CITY ENGINEERING COLLEGE

JAYANAGAR EDUCATION SOCIETY (R)

Doddakallasandra, Off. Kanakapura Road, Bangalore - 560 061.

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Date : 12/4/2021

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Jyothi
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Mob No.

CITY ENGINEERING COLLEGE
kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

Department of Applied Science and Humanities

Date: 9/4/2021

From,

Nagashree G
Dept of AS & H
Block - 62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of AS & H

Dear Sir,

Subject: Journal Publication in IJAREEIE

As I wish to publish a paper in the "International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE)". I request you to grant permission and provide financial support to me.

Thanking You


Your's Sincerely


Seal and Signature of HOD

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE, IE,
Doddakallasandra, Doddakallasandra Road,
BANGALORE - 560 062.



CITY ENGINEERING COLLEGE

JAYANAGAR EDUCATION SOCIETY (R)

Doddakallasandra, Off. Kanakapura Road, Bangalore - 560 061.

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Voucher No. 14

Date : 12/4/2021

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Ramesh
Sanctioned by
PRINCIPAL

G
Receiver's Signature
Mob No.



CITY
ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

Date: 13/4/2021

From,

Auribindo Koti
Dept of ECE
Blole 62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of ECE

Dear Sir,

Subject: Journal Publication in IJMRSET

As I wish to publish a paper in the "International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)". I request you to grant permission and provide financial support to me.

Thanking You


Your's Sincerely


Seal and Signature of HOD

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Bangalore Main Road
Bangalore-560062.



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Date : 16/4/2021

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AO

Ramesh
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Ausib
Receiver's Signature
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CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061



CITY
ENGINEERING COLLEGE

Department of Computer Science and Engineering

Date: 3/5/2021

From,

Sreevidya G
Dept of CSE
Blore 62

To,

The Principal,
City Engineering College, Doddakallasandra,
Bangalore-560062

Through,

HOD,
Dept. of CSE

Dear Sir,

Subject: Journal Publication in IJIRCCE

As I wish to publish a paper in the "International Journal of Advanced Research in Computer and Communication Engineering (IJIRCCE)". I request you to grant permission and provide financial support to me.

Thanking You


Your's Sincerely

Seal and Signature of HOD

HOD
Dept of Computer Science & Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra Off Kanakapura Road
Bangalore 560031



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JAYANAGAR EDUCATION SOCIETY (R)

Doddakallasandra, Off. Kanakapura Road, Bangalore - 560 061.

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Date : 5/5/2021

Voucher No. 16

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Rupees (in words) five thousand only

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By Cash / Cheque No. 5000 Dated 5/5/2021 Bank _____

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Checked by F. HANDE
AO

Sanctioned by Ramamurthy
PRINCIPAL

Receiver's Signature [Signature]
Mob No.

CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061