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NAAC ACCREDITATION -2022 Cycle 3

CRITERION 3

Research, Innovations and Extension

3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

- 1. First Page and Last Page of Book/Publication with ISBN Number**
- 2. Tabulated List of Teachers**

Submitted to



National Assessment and Accreditation Council

Optimizing Energy Consumption and Inequality in Wireless Sensor Networks using NSGA-II

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Abstract-Due to the widespread growing usage of Wireless Sensor Network (WSNs) applications in almost every areas including medical, battle field, surveillance, industrial production, etc., lifetime maximization of the WSNs using energy optimization has attracted a lot of attention of researchers. Various techniques for energy optimization has been suggested based on single objective optimization or conversion of multiple objectives into single objective optimization and thus, enhances the lifetime of WSNs but led to increase standard deviation of energy among sensors. Due to the higher standard deviation, the possibility of optimal usage of energy hinders and many sensors retain higher energy when a network goes down because of out of energy in some sensors of the network. In this context, this paper proposes a technique for optimizing both energy consumption and inequality Non-dominated Sorting Algorithm (NSGA) which is a well know two objective optimization method. The optimization problem is mathematically formulated and an adapted NSGA-II is proposed to solve the problem. Major components of adapted NSGA-II include representation of chromosome, computation of energy consumption and energy inequality and sorting using NSGA-II. The analysis of simulation results have clearly shown that the proposed techniques effectively optimizes both the objectives.

1. Introduction

In the past decade Wireless Sensor Networks (WSNs) have witnessed much development and due to recent technological and manufacturing improvements, which make it economically feasible. The availability of low cost sensors resulted in the wide range deployment of WSNs in every possible area of usage starting from accessible areas to non-accessible or remote areas. Its applications ranges from monitoring, such as battlefield investigation, building inspection, security surveillance, to civil applications for example weather monitoring, disaster management, etc. The sensor nodes of the networks perform sensing task and report the data gathered while sensing to the sink node using the underlying infrastructure. Exhaustive research and development are undergoing in WSNs to succeed in dealing with the issues including memory constraint [1], inadequate computation and communication capability [2], bandwidth limitation [3] and most important limited energy.

Energy is one of the most important issue in the sensor network as the nodes are having a limited energy. That's why a lot of research is going on and literature contains a lot of popular energy


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3.3.3 A 2016

Mobile Cloud Computing Energy-aware Task Offloading (MCC: ETO)

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ABSTRACT: Cloud Computing (CC) holds a new dawn of computing where multiple services are offered to the cloud users through internet. CC has a qualitative, flexible and cost effective delivery platform for providing services to IT users with the aid of internet. Due to advent of CC, capabilities of Mobile devices' system has been improved. Mobiles devices can now depend on CC and information storage resources, to carryout complex computational operations which includes multimedia, searching and data mining. Also when considering local cloud, computation service is provided by enhancing operation of mobile cloud which handles mobile devices as a service nodes for example sensing services and computation of task. The task that need to be computed has to be offloaded to local or conventional cloud to ease battery power. The energy consumption during offloading of task is highly significant. Hence, characterization of some of the recent research works on battery energy in MCC are grouped into dynamic and non-dynamic energy-aware task offloading and a comparative analysis table are presented and finally open research issues are qualitatively discussed based on critical assessment of the literature

1 INTRODUCTION

Mobile cloud computing has witnessed more rapid growth in terms of research due to the fact that mobile phones has become a vital part of human life as it is portable to move around with, which is very effective and suitable for communication irrespective of time and place (Fernando et al., 2013, Khan et al., 2013). The birth of MCC is a significant turnaround for computer science technology and also phone developers. Meanwhile, MDs are becoming more sophisticated due to development of large and complex applications. Consequently, MDs are constrained with challenges of battery power, memory space and computation power, for these reasons the idea of offloading task to the cloud has been integrated into mobile devices. When offloading task to cloud so many issues suffices such as security, quality of service and mobile application development (Kumar and Lu, 2010, Zissis and Lekkas, 2012). Figure 1. Represent system view of Mobile cloud computing. Applications which requires complex computations such as real time computing, image and voice processing, online game and video streaming, language and wearable computing demands high processing capabilities. These complex applications are challenge for MDs application developers in implement-

ing application for MDs. The problem of battery power and memory space are increasing due to high demand for smaller sized MDs, therefore, these challenges of battery power, memory space and computation power will be a lingering issue (Satyanarayanan, 1993). Hence, it has become paramount to adopt cloud computing solutions for mobile devices. Recently, many researches has been directed towards CC to address these challenges. CC can provides Infrastructure as a Services (IaaS) for MDs storage and Platform as a Services (PaaS) (Fox et al., 2009, Vogels, 2008) for MDs computation to alleviate their limitations. The basic idea of CC is to offload large and complex task to remote resource providers. Thus, security is needed for offloaded task confidentiality and integrity.

The remaining part of this paper is structured as follows: Section 2 describes MCC energy-aware task offloading taxonomy and comparative analysis of literature reviewed. Section 3 show outlined research challenges and open issues and finally section 4 is the concluding section.


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3.3.3 B 2016



Rise of Blockchain Technology: Beyond Cryptocurrency

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Abstract. This paper highlights how block chain technology will help in innovation and transformation of business and service sector. To solve the issue, the paper presents the architecture and benefits of blockchain technology. Further it discusses the implication of using blockchain technology in banking, transport sector, Internet of things (IoT), and in enterprises consisting of global commodity chains. The technology helps to bring a shift from technology driven to need driven approach. With all the advancement and benefits, there is further research to be done to fit the model in other areas like e governance which will benefit the society and public values.

Keywords: Blockchain · Finance · IoT · Architecture

1 Introduction

We stand on the edge of a new digital revolution. With the advent of internet, a new phase began for the human race. And now after many years of scientific research and experiments, we have reached a stage where science and technology continue to find newer ways to improve our lifestyles and bring more and more people into the mainstream. A manifestation of these attempts has been validated in technologies such as the Blockchain which implores upon finding solutions like decentralization and removal of third-party-authenticators. The Blockchain is encrypted, shared and distributed database that provides an irreversible and tamper-free public record keeping system. With this technology, digital property can be transferred and digital transactions can be carried out without the need of backing by a financial middleman [1]. This is a reason why this technology has capabilities that when explored to the right extent, it can provide utilities beyond the scope of what has been done till date. In the future we expect more digital markets working free from any regulation because it can take care of itself on its own based on self-emerging and approving techniques. We would also see decentralized communication platforms and internet based assets and properties that are freely exchanged [2].



Smart Healthcare Based on Internet of Things

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Abstract. With the advancement in technology, Internet of Things (IoT) enabled solutions are gaining lots of attention. The change in lifestyle of people leads to increase in health problems, which demands a need for ubiquitous healthcare system. In this paper, the work of various contemporary authors has been reviewed in different healthcare sectors. Further, smart bed model is proposed for addressing acute health problem of pressure ulcers or bed sores. The sensor based platform will collect and analyse the data using learning algorithm and accordingly will activate the actuators to distribute the pressure along the patient bed sores from time to time.

Keywords: Healthcare · Intensive Care Unit · Bed sore · Internet of Things

1 Introduction

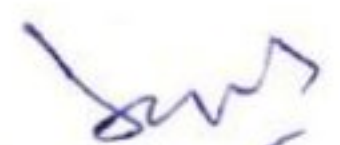
Internet of things (IoT) is emerging in probably every area of life. It is such a pioneering communication technique which aims to bring together different kind of digital devices with the internet. This is envisaging making the internet more ubiquitous. The IoT market is expanding rapidly as manufacturers, companies, vendor, etc. has recognized the potential it offers. According to reports, the worldwide IoT market will hit around US\$2 trillion by 2020. The devices in itself account for 32% of total IoT market worldwide. The IoT is joining most of the industries these days like smart city, smart healthcare, smart building, and lot more. These concepts have offered advancement in the quality of life of peoples, but also on the other hand improves the efficiency and asset management like smart grids, smart lightning, smart transportation system (e.g., smart mobility, smart traffic control), smart services, etc.

Internet-of Things (IoT) based smart healthcare systems will allow continuous, cheap and remote monitoring of patients with several chronic conditions like pressure ulcer, hypertension, heart failure, depression, obesity, diabetes, elderly care and other preventive wellness measure. The IoT is promising a significant role for improving the health and wellness of patients by providing the availability of service at the right time and also further reducing the treatment cost and other travel charges. The IoT based

© Springer Nature Singapore Pte Ltd. 2018

G. C. Deka et al. (Eds.): ICACCT 2018, CCIS 899, pp. 300–309, 2018.

https://doi.org/10.1007/978-981-13-2035-4_26


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3.2.2 E 2018

A Survey on Secure Routing Protocols Based on Trust Management in IoT

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Abstract: Internet of Things (IoT) is defined to be a network of devices which helps to manage the physical world using sensing, processing and analyzing the data generated by IoT objects. With the advancement, it is predicted that by 2020, the devices connected to the network will grow exponentially to some billions. Though application is increasing every day, but security will pose a challenging threat on this emerging technology. Therefore secure routing in IoT must be designed for objects. The devices of the network are prone to internal attacks for which trust based techniques are devised. This survey will analyze the contemporary trust based routing protocols for IoT and sensor networks and will propose the future strategies for better secure IoT routing.

Keywords: Trust Management, Fuzzy, Internet of Things, Dempster Shaffer theorem(DST)

1. Introduction

With the development in wireless and mobile computing technology, a new area is getting a lot of attention that is Internet of Things (IoT). Internet of Things (IoT) is defined as the global network which helps to monitor the physical world phenomenon by sensing, processing and communicating of the data generated by IoT sensor nodes. all these IoT objects consist of sensors, Global Positioning system (GPS), Laser scanners, radio frequency identification devices and many other. These objects are connected through internet and therefore can be remotely accessed and managed. IOT finds its application in many fields from house to industries to control the physical world around us. The devices communicate through internet. In IOT[1], one can control the targeted physical environment with the help of a number of sensing device setup there. The devices referred to as "things" are connected to a network and controlled from remote locations. These devices have to intercommunicate with the environment around it. They run on battery power as Internet of Things (IoT) is defined to be a network of devices which helps to manage the physical world using sensing, processing and analyzing the data generated by IoT objects. With the advancement, it is predicted that by 2020, the devices connected to the network will grow exponentially to some billions. Though application is increasing every day, but security will pose a challenging threat on this emerging technology. Therefore secure routing in IoT must be designed for objects. The devices of the network are prone to internal attacks for which trust based techniques are devised. This survey will analyze the contemporary trust based routing protocols for IoT and sensor networks and will propose the future strategies for better secure IoT routing. They have to be installed at remote locations. As IoT is an integration of varieties of network [2,3] which brings different types of security challenge like in sensor devices, mobile communication challenge, network privacy and many other. IoT supports a lot of area like intelligent transport system, smart garbage system, business management, e health, etc. But all these benefits and application comes at dependence on architecture, traffic routes, Physical connectivity and all. Different routing protocols for IoT and sensor networks has been proposed in Literature [4,5,6].

[7] predicts that the number of connected devices will reach up to fifty billion by 2020. With the widespread use of IOT devices, security issue has become a topic of interest. In a network, there are various communicating nodes that send and receive signals. During the process of communication, there is a high risk of packet drop that lead to various

security issues like privacy loss and confidentiality. The nodes may send false signals to other nodes. This gives rise to the concept of trust management in IOT, which means establishing reliability (i.e. trust) among nodes. As the devices run on limited power supply, the devices are designed to have low computing and processing capability so that less energy is consumed. Due to limited power supply, they are not expected to follow all the security protocols for robust secure network.

This paper deals with secure routing techniques that can be applied to the network so that least energy is consumed along with maintenance of robust security and reliability in the network. It also reviews various research papers based on trust management among nodes. The first part describes the need for IOT security, whereas the second part reviews various research papers that have implemented different security techniques.

2. Need for Security

Devices are installed in different types of environment that may include private as well as public environment. These devices continuously receive private information also. So, network must ensure that the private/confidential data is not leaked on the way. As soon as a device is entered into internet, it is prone to be attacked internally as well as externally. Attackers can make nodes malicious without making the network of the attack. These attacks can lead to serious disasters. So, routing protocols and trust mechanisms must ensure that data is safe and nodes are free from attacks. As the number of devices in a network increase, network traffic also increases. This may lead to sending of data packets to untargeted destination. If proper authorization protocol is not applied, there is a high risk of unauthorized access into the network. External nodes might be added to the network that is of great threat.

There are different types of attacks: modification attack, on-off attack, bad mouthing attack and collusion attack. In modification attack, the relay stations (i.e. Routers and switches) are attacked where the received data packets are modified and relayed to other nodes. This activity is neither known to the sender nor to the receiver. In on-off attack, the malicious node selectively behaves as good or bad. The attacker wants to ensure that the malicious node is not detected. The third attack, bad mouthing attack, sends faulty information about destination node to decrease its the trust value. In forth attack, many nodes form a group expecting to increase their trust value so that they are not detected as bad ones. There are various other attacks like software and hardware susceptibility where software and hardware are responsible for inability to follow data encryption methods. This paper further discusses the trust management mechanism and reviews the various protocols and algorithms in the next section, which have been proposed to enhance the security of the network in contemporary years.

3. Trust Based Security Protocols

The word 'trust' in Information Security refers to belief in reliability of other nodes. It can be understood as the level of acceptance that a node can have on other node. Once assurance is gained over a node, it is listed in the trusted list of the network. This allows accepting packets from the node in future [5]. It ensures secure and reliable connection among the nodes in a network. Trust level is maintained on the basis of trust value which is calculated from algorithms. Trust value can be measured on a continuous scale 0 to 1, where 0 means no trust and 1 means complete trust. Two

Image stitching algorithm for subject geometry preservation (using image mosaicing)

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Abstract:

In this paper, we explore the possibility of improving image stitching with respect to subject's geometry. Through recent advancements in object detection it has become possible to identify major landmarks in image (Tensorflow). Traditional approach looks for the best matches in the images and due to depth of perception the most prominent points are usually in the background. Our approach focuses on the possibility to detect the subject and use the feature points extracted from the subject for stitching the image which results in preservation of subject geometry. By focusing the feature points on the subject, we obtain better geometry, this is particularly useful if the image is to be used in a 3-dimensional environment.

Keywords: Feature points; Subject geometry, image mosaicing.

1. Introduction

A commonly used method for increasing the Field of View of a camera is by taking multiple images of a scene and then combining these scenes into a single image, this is also known as mosaicing. This technique eliminates the case of parallax which is resulted due to the motion of the observer, making the task of combining images more straight forward [1]. Images which are taken from a slightly different angle or are in approximately same plane, having a same part of the view can be combined with the help of mosaicing. Now-a-days mosaicing is being used in many computer vision and computer graphics applications like video indexing [3], video compression [4] and augmented reality [5]. The various steps of image mosaicing are: registration, reprojection, stitching, and blending.

- Registration is the process of finding the geometric correspondences within a number of images taken from a single scene at different times, from different viewpoints. We select a reference image and then use that to align the other images with respect to the reference image.

- Reprojection is done using the geometric transformations which are computed in previous step, and align the set of images into a common coordinate system.
- Stitching is a process of overlaying all the reprojected images into a single big image by merging the pixel values of the overlapping portion and keeping the same pixels where no overlapping occurs.
- The final step for image mosaicing is the blending part, here we use algorithms known as blending algorithms that are used to remove noticeable edges and discrepancies in the combined image [2].

Mosaicing techniques can be classified based on image registration as well as image blending methods, which directly influence the performance of image mosaicing as these two are the main steps for image processing. These classifications are given in *Debabrata Ghosh and Naima Kaabouch's* paper [2] which provides a wider view on the algorithms used for image mosaicing.

In this paper, we are using SURF detector-based mosaicing algorithm which is a part of low level feature based mosaicing, based on image registration method. In SURF (Speeded-Up Robust Feature) detection, the search for discrete image point correspondences can be divided into 3 main steps as given by *Herbert Bay and Tinne Tuytelaars* [6]. First step is to find interest points of the subject at distinctive locations in the image, such as blobs, corners. Repeatability is the most important property of the interest point detector. The reliability of a detector is expressed by its repeatability for finding the same physical interest points under different conditions of viewing. Next comes the neighbourhood of every interest point, which is represented by a feature vector. This descriptor has to be characteristic and unaffected by noise, photometric or geometric deformations. In Third step descriptor vectors are matched. These vectors correspond to difference images of the subject. This matching is grounded on distance between the various vectors.

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Marine Monitoring based on WSN: Application and Challenges

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Abstract: With an increase in industrialization and high standard of living has led to the drastic effect on climate. Both terrestrial and marine environment got affected and reaching to a level of irreversible change. Marine environment monitoring is an important problem and has attained a great deal of attention from researchers and scholars. In the last decade, different techniques for marine environmental monitoring based on WSN has been proposed. Conventional marine monitoring techniques based on oceanographic research vessels is very costly and time-consuming and also very low in space and time resolution. WSN has been observed as an important alternative for monitoring marine environment due to a lot of advantages. The paper presents the basic architecture and challenges faced by marine-based WSN. This also explains how climate change control will get benefit from the Marine based wireless sensor Network.

Keywords: Marine Monitoring, Sensor Networks, Buoy Design.

1. Introduction

WSN is a network which deploys sensor nodes in a random fashion which are having the capability of sensing and computing the data, which are sensed and observe by the respective nodes. The sensed data is further transmitted to the centralized location called as sink using multihop transmission where the data is processed and corresponding actions will be taken accordingly. A WSN has different issues like topology constraint, uncontrolled environment, restricted energy resource and computational capability [1]. Usually, WSN works in a dense and hostile environment where a large number of sensors are deployed in order to improve the fault tolerance and system reliability.[2]

In the past decade, with the improvement in hardware and cost-effectiveness of sensor nodes, has increased its application in every field of life like military surveillance, weather forecasting, forest monitoring, agriculture monitoring, water study, and monitoring.[14] health-related field and many other. This technology can be used for the study and monitoring of marine environments. Further these days people are so conscious regarding environment around us. Ocean has the vast amount

of resource at every level whether its continental shelf or deep ocean basin. The ocean is a source of tidal energy but on the other hand, it has been affected a lot by human activities like tourism, urban development, industry, which are further degrading the biodiversity and environment. Earlier, vessels are used for oceanographic research to study the ocean and other marine environments, which is very costly and tedious process that has a constraint of low resolution both in space and time. This WSN based approach has provided the access to large geographic areas with real-time data coverage. Further research shows, WSN based approach is far cheaper and accurate than vessel-based research.

For the WSN based marine environment monitoring, different variety of sensors is deployed for the monitoring and measuring the various physical and chemical parameters such carbon dioxide percentage, dissolved oxygen (DO) level, subsurface temperature, pressure, wind direction and velocity, pH level, and turbidity. The WSN based marine environment need to address a number of challenges like reliability, fault tolerance, scalability. Further, following factors need to be taken into account while designing and deploying the wsn [3]

- Water resistant as the nodes have to deploy in ocean or sea so it should be highly water resistant.
- High robustness: Marine-based WSN has to withstand a lot of tidal waves, currents, typhoon, etc which will cause disruption in the network because of movement or damage of nodes.
- Energy usage: This type of network utilizes more energy than terrestrial network because of the distant communication area.
- Other challenges: there are some other challenges also like deployment and maintenance of nodes, coverage and connectivity issues.

There has been very less literature in the field of marine environment based WSN. With rising in sea level and irreversible climate change has made it essential for the researcher to study and monitor every aspect of factors affecting the environment. The paper is organized as follows: section 2 explains the basics of WSN based Marine Environment monitoring. Section 3 describes different challenges faced by WSN based Marine Environment monitoring like how to protect sensor nodes, to make the system more sustainable. Section 4 provides how the system will help to make the environment more sustainable and will help to monitor climate change. It further explains the benefits of new technology from the perspective of economic growth.

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2. Basic Overview

The section describes the basic overview of marine-based WSN which includes its application, its general monitoring WSN architecture, Marine-based sensor node architecture and its related wireless technologies.

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A. Application

Marine environment monitoring has a wide range of applications: marine biodiversity monitoring, ocean bottom monitoring, water physical and

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A Prototype for Realtime Monitoring of Fetal Health using a Pressure sensitive material and Sensor based Belt

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Abstract—Monitoring wellbeing of the fetus is one of the challenges faced by obstetrics. The fetal movement will determine the health and growth of fetus for which different techniques have been explored like heart rate monitoring, kick pattern, and other health. With the improvement in technology, several remote monitoring techniques are introduced like accelerometer-based system in form of body worn or fetal kick detection based, etc. All the techniques have been discussed in the paper. Further, the paper presents a new prototype of the fetal kick detection device. The real-time monitoring of fetal kick will be analyzed using a belt worn by the patient consisting of pressure sensitive material and various sensors for detecting the fetal distress based on machine learning mechanism. In the future, the design will be developed and the belt will be analyzed in real time scenario.

Keywords— Pressure Sensitive Material; Remote Monitoring; Foetus; Sensor;

I. INTRODUCTION

Monitoring fetal health continuously and accurately is one of the main challenges of the gynecology. It is always important to constantly monitor the fetus at regular intervals of time to save the mother as well the child from major consequences beforehand. Therefore different techniques and were introduced in order to achieve this goal. Fetal monitoring includes all kind of changes observed in the fetus during pregnancy [1]. The mother can start feeling fetal movement which is normally called quickening during the first trimester depending upon the number of pregnancies the mother had before. Various conditions such as alterations in fetal heart rate, a gradual decrease of fetal movements i.e. kicks show some problem in the wellbeing of the fetus. Decreased fetal movements are majorly associated with poor pregnancy outcomes such as stillbirth or inappropriate limb development or brain or heart diseases of the child [2].

In contemporary scenario, doctors have used various techniques like FECG, Ultrasound-based, but these have their shortcoming and in the long run, it affects the health of the child. Fetal electrocardiogram (FECG) is a cardiogram consisting of electrical activity recordings. The technique

records the health rate of the fetus but the disadvantage of this method it provides a low signal to noise ratio (SNR) because of interference of many noises. The mother electrocardiogram plays a major role in this method. Magnetocardiography (MCG) is another technique for measuring the magnetic fields produced by electrical activity in the heart using extremely sensitive devices such as the superconducting quantum interference device (SQUID). These magnetic fields go through the skin and provide a direct "view" of the heart and its movement but low field magnetic sensors are difficult to implement and typically require a shielded environment. Further, Cardiotocography (CTG) is a technical means of recording the fetal heartbeat and the uterine contractions during pregnancy. In this, an elastic belt is used which has two round plates in it which detect the heartbeat. The jelly is applied on mother's body to get a strong signal and the belt is connected to the machine which interprets the signals coming. The advantage of CTG is the evidence has shown that there were fewer instances of newborn seizures when continuous monitoring was used. On the contrary, in CTG many women feel EFM makes them 'tied to the bed'. Women report in some instances labour support from health care professionals is disturbed when EFM is used – time and attention is given to the reading and less monitoring time. Different fetal monitoring techniques based on ultrasound or accelerometer based has been proposed in the literature in the past few years. These techniques suffer from various inconsistencies like accelerometer position, sensor types or signal processing make it difficult to understand what is best alternative methods. In the past lot of research using sensors[3] and how to improve the efficiency of various sensor-based technologies has been devised [4,5, 6].

Therefore, the paper proposes a real-time fetal movement detection belt. The belt consists of a pressure sensitive surface using a special material to detect fetal movements and sensors like lm35 and flex sensor to take analog inputs to detect mother's paramedics which are given to the microcontroller

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Intelligent Embedded Security control system for Maternity ward based on IoT and Face recognition

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Abstract— Internet of things (IoT) is an advancing technology for the creation of smart world that has the capacity to provide automation, safety and security through ubiquitous communication. The paper discusses various applications and works of contemporary authors. It has been observed that large number of sensors, devices, and smartphones are connected to the internet for providing personalized services like smart home, smart transportation, smart healthcare, etc. in this paper, Maternity ward security control system is proposed in which design and development of maternity ward is based on human face recognition and remote monitoring technology. The model regulates the entry of person according to identity and gender which will help in providing the security. Face detection and recognition algorithm is used for finding the identity and further wireless interface has been used for updating the database in case of new person and further alert message is sent. In future, the design is implemented and results will be analyzed in real time scenario.

Keywords—Embedded control system; face recognition; IoT; Maternity Ward.

I. INTRODUCTION

Internet of Things (IoT) is the next generation of innovation in this smart and fast going world. A huge number of objects is being connected to internet at a vast scale [1]. In the field of IoT the objects communicate and exchange information to give advanced intelligent services for users. It is a growing field. In future most of the things would be done with the help of IoT like delivering food, making a shopping list, etc. From switching on the light to making a shopping list, everything would be based on IoT. In 2008, CISCO reported that the number of things connected to the Internet surpassed the number of people living on Earth, whereas, in 2020, it will reach the limit of 50 billion, resulting in the enrichment of the digital world [1]. IoT plays a vital role in different domains of area. IoT is making people life easier [2]. IoT is used in healthcare, transportation, emergency, etc. IoT empowers an object to hear, see, listen and communicate at the same time. In future, the internet will no longer be considered as a

network of computers, whereas, it will involve billions of smart devices connected to each other along with embedded systems. Which result in significant increase of the scope and size of IoT, this would provide new opportunities and challenges as well. IoT is flourishing very well. IoT is considered to be probably the next large area of work in the world of internet. Several work is to be done in Internet of Things (IoT) and several researches and experiments are being executed. Since a lot of data would be stored in the IoT as each and everything would be connected through the internet, so there would be requirement of a lot of space, here comes the term "Big Data". Lots of data can be stored in cloud as well, but with this we have to secure our data as well as it would be vulnerable for attacks.[3,4]

There are many techniques used in Internet of Things, one is RFID identification system. It is based on RFID reader is made up of two components plurality of tags and a back-end system which is connected using network connectivity like WLAN (wireless local area network). The RFID reads the identification information i.e, unique information from which it can identify, it then exchange it with back-end system for further processing. Which means that in RFID identification, it first matches the id with its database and after that if it matches then it goes for further processing.

Smart city is the concept which is based on internet and communication technologies, which makes the cities more sustainable. It consists of different smart devices like smart parking, smart healthcare, smart environment. In these areas, where various smart devices like sensor[5, 6], servers etc are connected to make the lives of people easy and comfortable. The smart is defined to be which autonomously obtain and align the knowledge. There are a lot of applications in case of smart environment, one of them is smart security system or web based online security system. The proposed system is based on wireless access control system which is developed and specifically designed for smart embedded control system for maternity ward healthcare. As we have seen with increase in crime rate, lot of children has been taken from wards. These new born are highly vulnerable. Most of them are abducted by child trafficking or for sexual abuse. Therefore, the security of

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Hybrid Cryptosystem based Security in Cloud Computing

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Abstract—The advancement in cloud computing has led to emergence of the era which projects the evolution in technology which is infrastructure less architecture, without actually installing the software on the end and many other development models. This is improvement from the earlier mainframe computer to a client server model which includes the benefits from grid computing, autonomic computing, and utility computing. The advantages of cloud come with the challenges and one of the most important is security. The security of resources is at risk and also the traditional security approaches is not effective for the cloud. As a result the paper discusses the potential security requirements and further will discuss the possible security solutions. The paper proposes a mechanism which is based on third party which is trusted for assuring security in cloud environment. The proposed technique is based on cryptography and public key infrastructure with single sign in and LDAP. This mechanism helps to ensure authentication, confidentiality, and integrity of concerned data and communication

Keywords—Cryptosystem, LDAP, Cloud Computing, SaaS;

I. INTRODUCTION

In 1960, time sharing utility has been introduced which is followed by networking of computers in 90s, further grid system of last decade. This kind of separation is trending now a days, as most of the academicians and entrepreneurs are attracted towards this new technology.

The Cloud computing is considered as future technology based on innovative information system. Cloud has declined the dependence of users on the hardware which reduces the complexity and client side requirement. Though the cloud is showing promising results but it has challenges on the security front. As the complexity and feature of cloud differs from traditional approaches therefore the new features and upgradation is necessary. In the paper, we tried to identify the security issues faced by clarity. The requirement for the security is discussed. The paper proposes a solution which is

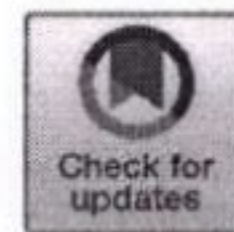
based on trusted third party mechanism. Third party considered a federation of clouds for realizing the actual benefit from the information system [1,2].

In early 90's grid computing has been successfully emerged. Grid computing is a distributed architecture of large numbers of computers connected to solve a complex problem and data intensive scientific calculations. It is server that runs independent tasks and is loosely linked by the Internet or low-speed networks. On the other hand, utility computing presents the model of providing resourced-on-demand and charging customers based on usage. It is a computing business model in which the provider owns, operates and manages the computing infrastructure and resources, and the subscribers access it as when required on a rental or metered basis. Cloud computing has been resulted as the combination of above techniques, which is defined as technique in which the resources are deployed on common external storage [3,4]. Cloud computing allows users with various computing capabilities to store and process data in a private cloud located in a data center, thus making data-accessing mechanisms more efficient and reliable. It often refers to the delivery of on-demand computing resources, everything from applications to data centers, over the internet on a pay-for-use basis. The basic backbone which empowers the cloud technology is virtualization technique from 1970's, which is for these years only available at mainframe systems. In the prototype, there is an application which runs on the host computer called as hypervisor which will generate virtual machines, for the simulation of physical computers ranging from operating system to end user computers. On the hardware level, different resources like hard drives, processors, are located in the data centers which are necessary for storing the data and processing the information. For all this, various software, virtualization layer and task management layer play an important role. Virtualization is the most important part of cloud execution and is used for providing cloud features like resource pooling.

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Evaluation of Common Barriers to the Combined Lean-Green-Agile Manufacturing System by Two-Way Assessment Method



Punj Lata Singh, Rahul Sindhwani, Naresh Kumar Dua, Anbesh Jamwal, Ankur Aggarwal, Aamir Iqbal and Nishant Gautam

Abstract The rapid development in the industry and ever-increasing manufacturing competitiveness around the globe has diverted industries towards the adoption of new manufacturing systems. The industries have moved from a singular manufacturing system to a combination of two of them in order to cope with the expansion of market structure and customer requirements. In today's scenario, a need for a more sustainable manufacturing system has emerged, therefore a combination of lean, green and agile manufacturing systems can provide the required results. The adoption of a Lean-Green-Agile Manufacturing System (LGAMS) in the present market scenario would be influenced by a few barriers viz. lack of top management support and commitment, fear and resistance to organizational change, financial constraints/risk of business, etc. The barriers can be attributed to different perspectives depending on their field of influence like economic, technical and organizational perspective. An attempt has been made to prioritize the influencing nature of each barrier. Application of analytical hierarchy process (AHP) would yield the required prioritization of the LGAMS barriers. This multi-criteria decision method is prone to instability due to crisp inputs. A further extension of AHP, i.e. fuzzy AHP—AHP with fuzzy inputs has been utilized. Further, a cross-check has been performed for the above results by using two-way assessment method.

Keywords Lean manufacturing · Green manufacturing · Agile manufacturing · Barriers · Multi-criteria decision analysis · Analytical hierarchy process · Fuzzy AHP · Two-way assessment method

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© Springer Nature Singapore Pte Ltd. 2019

K. Shanker et al. (eds.), *Advances in Industrial and Production Engineering*, Lecture Notes in Mechanical Engineering, https://doi.org/10.1007/978-981-13-6412-9_62

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© डॉ. नरेश मिश्र

ISBN 978-93-88107-54-9

प्रथम संस्करण : 2019

मूल्य : ₹ 900.00

शब्द संयोजन :

हर्ष कंप्यूटर्स


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मुद्रक :

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—डॉ. विकास कुमार

हिंदी साहित्य का भक्तिकाल ईश के आराधन की विविध पद्धतियों से जुड़ा हुआ है। भक्ति में एक ओर निर्गुण निराकार की साधना है, तो दूसरी ओर सगुण की राम और कृष्ण भक्ति धाराएँ सामने आई हैं। भक्तिकालीन कृष्ण-काव्य-धारा के सर्वश्रेष्ठ कवि, बाल-मनोविज्ञान के महान चित्रकार और वात्सल्य रस के अद्भुत व्याख्याता महाकवि सूरदास का समग्र काव्य रस का अगाध सागर है, लेकिन वात्सल्य रस संबंधी वर्णन तो रस की भीगी वह रोटी है जिसे जहाँ से तोड़ो, आनंद-रस रूपी अमृतधारा बहती है। हिंदी साहित्य में संस्कृत के नौ रसों के अतिरिक्त दसवें 'वात्सल्य रस' की स्थापना करने का श्रेय सूरदास को मिला है।

आचार्य रामचंद्र शुक्ल 'हिंदी साहित्य का इतिहास' में लिखते हैं, "शृंगार और वात्सल्य के क्षेत्र में जहाँ तक इनकी दृष्टि पहुँची वहाँ तक और किसी कवि की नहीं।" तुलसीदास को हिंदी के 'सूर्य' मानने वाले आचार्य शुक्ल ने बालसुलभ भावों के मनमोहक वर्णन में सूरदास के चित्रांकन को तुलसीदास की प्रस्तुति से कहीं अधिक गुरुतर माना है—“गोस्वामी तुलसीदास जी ने गीतावली में बाल लीला की इनकी देखादेखी बहुत अधिक विस्तार दिया सही, पर उसमें बालसुलभ भावों और चेष्टाओं की वह प्रचुरता नहीं आई, उसमें रूप वर्णन की ही प्रचुरता रही।”²

वस्तुतः कृष्ण के बाल-जीवन का वर्णन करने में सूरदास साहित्य-संसार के समस्त कवियों में अनूठे हैं। वे कृष्ण के जन्म से लेकर घुटनों के बल चलने, बालहठ करने आदि का मन भावन वर्णन करते हैं। कृष्ण की भाखन-चोरी पकड़े जाने पर तर्क करना, खेलना, शिकायत लगाना आदि का विशद-व्यापक चित्रण उनके वात्सल्य

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होते हैं। मनुष्य की मानवीयता ही नहीं अपनों के प्रति अपनापन भी विलुप्त हो
जाता है तो हर आँगन में सूर के वात्सल्य के रसवर्णन की अपेक्षा है। इससे हर मन
हृदय और स्नेह का भाव जगेगा, हर आँगन में किलकारियों की गूँज से आनंद
का प्रवेश बनेगा।

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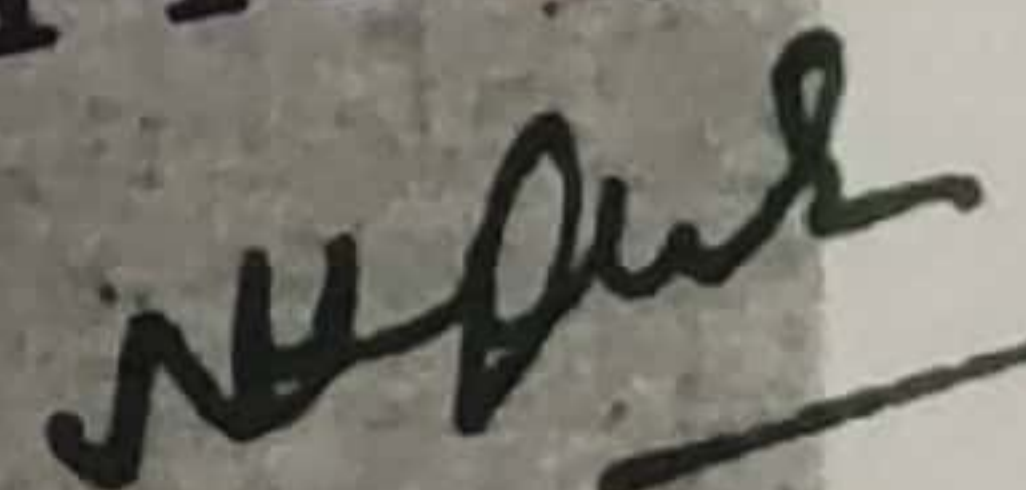
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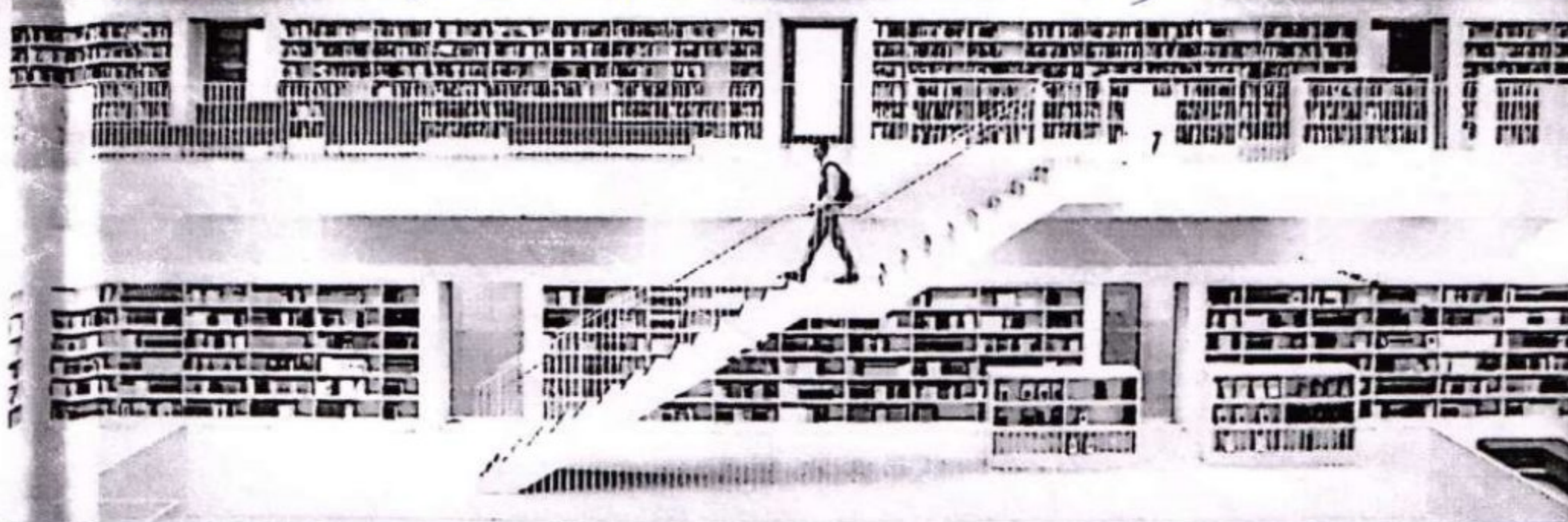
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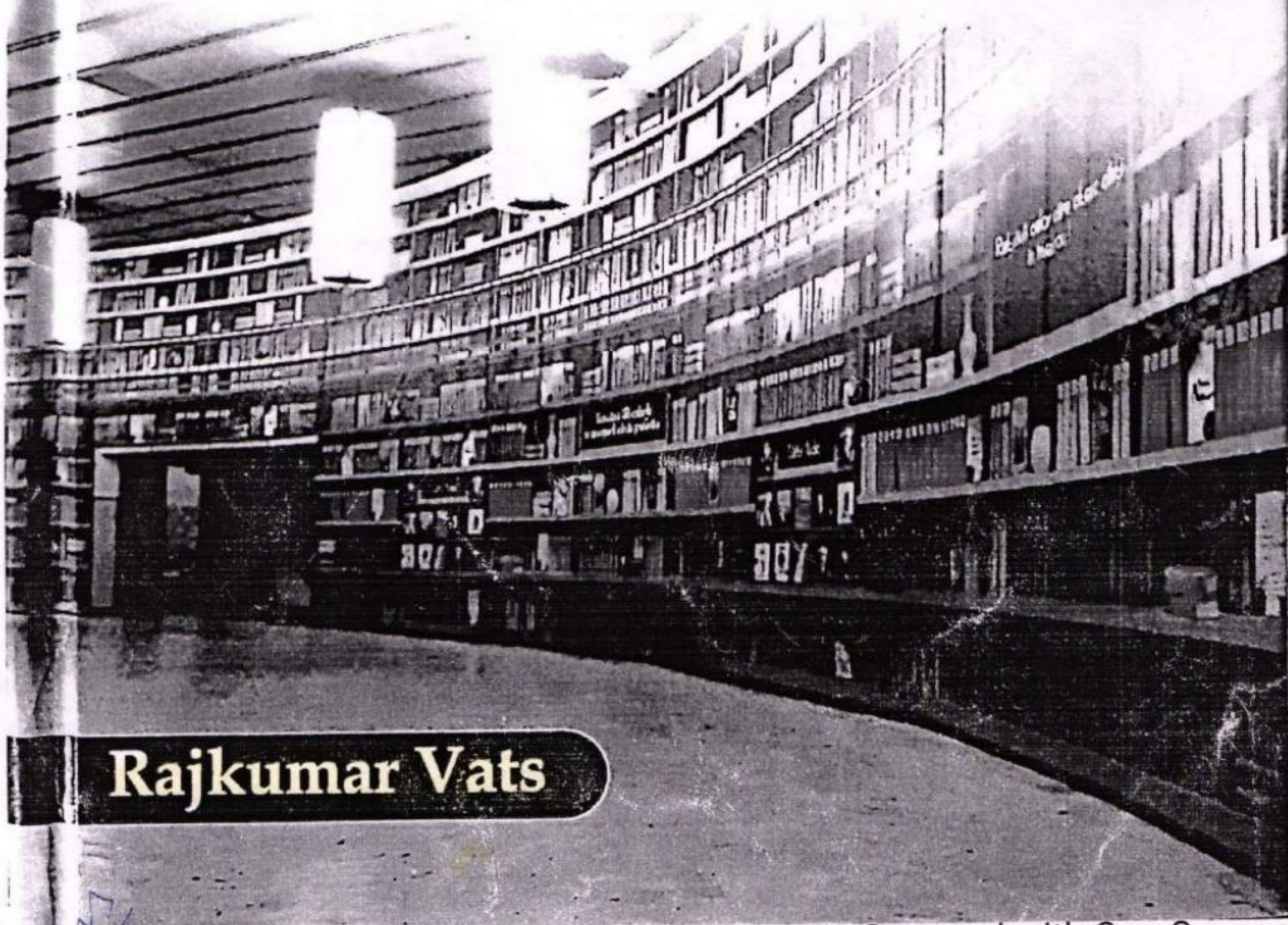
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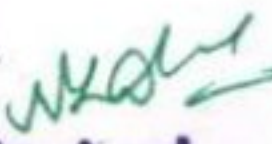
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First Published 2020

ISBN: 978-93-89885-27-9

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Published in India by

MANISHA PUBLICATION


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Kadipur, Delhi-110036

Mobiles: 9818804536, 9811195333

Email: manishabooks111@gmail.com

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1

Introduction


"Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks."

—Stephen Hawking

As we intend to study the application of ICT in libraries in this book, it is imperative to have a clear knowledge of information and communication technology and libraries. First, in this chapter you will learn about the ICT-basic notions and applications.

Introduction

Information era, knowledge world, ICT, internet, Web, WWW, digital and IT etc., are the buzzwords these days, Modern information and communication technologies have created a "global village," in which people can communicate with others across the world as if they were living next door. For this reason, ICT is often studied in the context of how modern communication technologies affect society. Technology has impacted almost every aspect of life today, and education is no exception. Or is it? In some ways, education seems much the same as it has been for

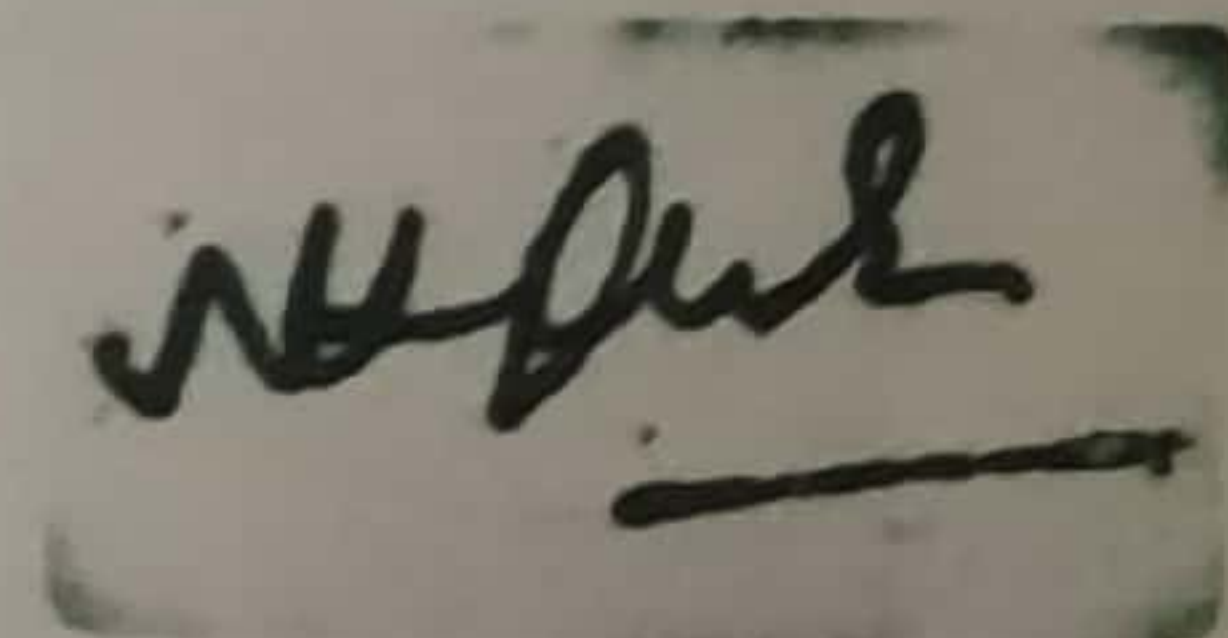

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Libraries Under Transformation

Mr. Rajkumar Vats

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Problems & Prospects

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Libraries under Transformation: Problems & Prospects

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First Published 2021

ISBN 978-93-89885-95-8

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Published in India by

MANISHA PUBLICATION


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Email: manishabooks111@gmail.com

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Printed at: Global Printing Services, New Delhi-110092.


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Introduction

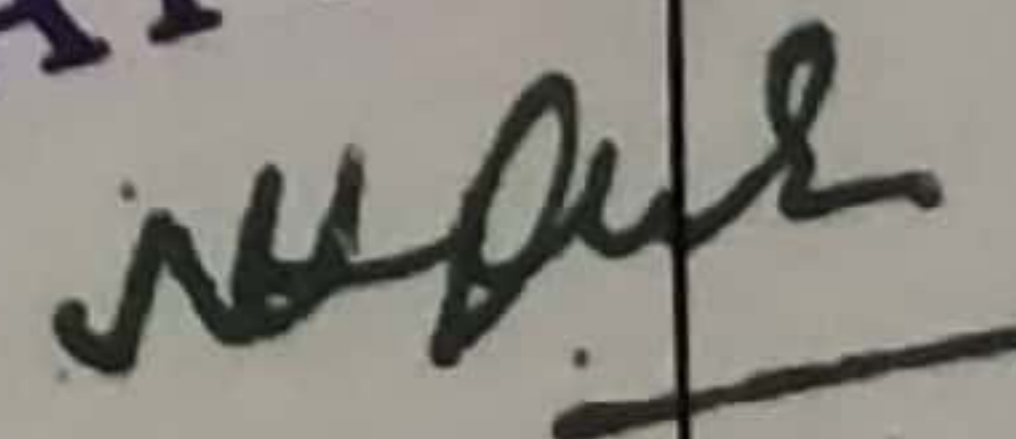
"Ranganathan's 5 Laws: Books are for use. Books are for all. Every book its reader, or every reader his book. Save the time of the reader. A library is a growing organism."

— S.R. Ranganathan

As of now most people perceive, a library is a collection of materials or media that are accessible for use and not just for display. It provides physical or Digital access to material, and may be a physical location or a virtual space, or both. A library's collection can include printed materials and other physical resources in many formats such as DVDs, as well as access to information, music or other content held on bibliographic databases.

A library, which may vary widely in size, may be organized for use and maintained by a public body such as a government, an institution, a corporation, or a private individual. In addition to providing materials, libraries also provide the services of experts at finding and organizing information and at interpreting information needs, navigating and

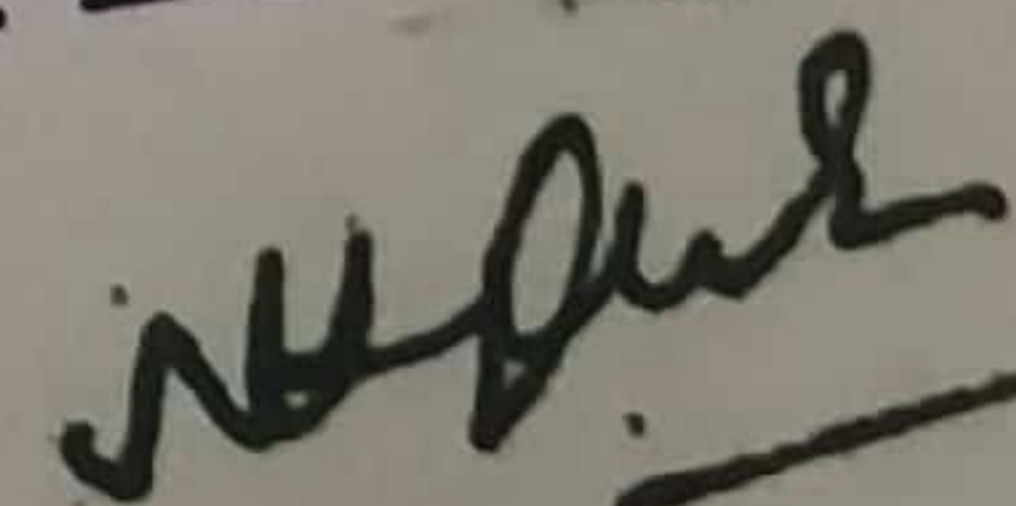
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ABOUT THE AUTHOR

Libraries are repositories of knowledge and information and are indispensable in the information age. With the merging of information technology with library science, the nature of libraries and the scope of their services have radically changed. Thus, the profession involves wide range of reading and processing of the information content through cataloguing, classification and indexing, storing documents, and retrieving the required information and so on.

As gateways to knowledge and culture, libraries play a fundamental role in society. The resources and services they offer create opportunities for learning, support literacy and education, and help shape the new ideas and perspectives that are central to a creative and innovative society. They also help ensure an authentic record of knowledge created and accumulated by past generations. In a world without libraries, it would be difficult to advance research and human knowledge or preserve the world's cumulative knowledge and heritage for posterity. Coming to education and training in the discipline, the Department of Library and Information Science of many universities in the country offers higher education facilities including B.Lib.Sc., two year integrated M.Lib.Sc., one-year M.Lib.Sc., MPhil and PhD programmes in the discipline. The prominent among them include: University of Madras, Chepauk, Chennai; Bangalore University, Bangalore; Annamalai University, Annamalai Nagar, Andhra University, Visakhapatnam, University of Mumbai, Mumbai; Banaras Hindu University, Varanasi; Jiwaji University, Gwalior; Aligarh Muslim University, Aligarh; Rajasthan University, Jaipur, University of Calcutta, Kolkata etc.

ABOUT THE AUTHOR



Rajkumar Vats is hailed from Rohtak District of Haryana. He obtained his B.A., LL.B. and M.Lib. (Library and Information Science) from M.D. University, Rohtak. He also qualified UGC-NET (Library and Information Science) in 2013.

A keen researcher, Rajkumar vats has attended many seminars and conferences and many of his research papers have published in national and international journals of repute. He is a lifetime member of Indian Library Association.

Currently he is working as Librarian at Sat Jinda Kalyana College, Kalanaur, Rohtak (Haryana).



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ISBN 978-93-89885-95-8



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3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

S. No.	Name of Teacher	Title of the paper	Title of the book/chapters published	Title of the proceedings of the conference	Name of the publisher	Year of publication	National / International	ISBN/ISSN number of the proceeding
1	Dr. Aanchal Khatri	Optimizing energy consumption and inequality in wireless sensor networks using NSGA-II		Proceedings of the communication and computing systems ICCS 2016	IEEE	2016-2017	International	978-113-80-295-21
2	Dr. Aanchal Khatri	Mobile cloud computing energy-aware task offloading (MCC: ETO)		Proceedings of the communication and computing systems ICCS 2016	IEEE	2016-2017	International	978-113-80-295-21
3	Dr. Aanchal Khatri	Rise of Blockchain Technology: Beyond Cryptocurrency		Communications in Computer and Information Science book series	Springer	2017-2018	International	186-509-29
4	Dr. Aanchal Khatri	Smart Healthcare Based on Internet of Things		Communications in Computer and Information Science book seri	Springer	2017-2018	International	186-509-29
5	Dr. Aanchal Khatri	A Survey on Secure Routing Protocols Based on Trust Management in IoT		International Journal of Advanced Studies of Scientific Research	SSRN , Elsevier	2018-2019	International	2456-0421
6	Dr. Aanchal Khatri	Image stitching algorithm for subject geometry preservation (using image mosaicing)		International Journal of Advanced Studies of Scientific Research	SSRN , Elsevier	2018-2019	International	2456-0421
7	Dr. Aanchal Khatri	Marine Monitoring based on WSN: Application and Challenges		International Journal of Advanced Studies of Scientific Research	SSRN , Elsevier	2018-2019	International	2456-0421
8	Dr. Aanchal Khatri	A PROTOTYPE FOR REAL TIME MONITORING OF FETAL HEALTH USING A PRESSURE SENSITIVE MATERIAL AND SENSOR BASED BELT		2018 International Conference on Advances in Computing, Communication Control and Networking (ICACCCN)	IEEE	2018-2019	International	978-153-86-411-94
9	Dr. Aanchal Khatri	INTELLIGENT EMBEDDED SECURITY CONTROL SYSTEM FOR MATERNITY WARD BASED ON IOT AND FACE RECOGNITION		2018 International Conference on Advances in Computing, Communication Control and Networking (ICACCCN)	IEEE	2018-2019	International	978-153-86-411-94
10	Dr. Aanchal Khatri	HYBRID CRYPTOSYSTEM BASED SECURITY IN CLOUD COMPUTING		2018 International Conference on Advances in Computing, Communication Control and Networking (ICACCCN)	IEEE	2018-2019	International	978-153-86-411-94
11	Dr. Naresh Kumar Dua	Evaluation of Common Barriers to the Combined Lean-Green-Agile Manufacturing System by Two-Way Assessment Method	Advances in Industrial and Production Engineering		Springer	2018-2019	International	978-981-13-6412-9
12	Lt Dr vikas kumar	Sur ke Vatsalya Mein Madhurya Ka Charam Utkarsh	Bhakti Kaaleen Kavya ki Prasangkita		sanjay prakashan, Delhi	2019-20	National	978-93-88107-54-9
13	Raj Kumar Vats		Roll of ICT Tool in Libraries		Manisha Publication, Delhi	2019-2020	National	978-93-89885-27-9
14	Raj Kumar Vats		Libraries Under Transformation		Manisha Publication, Delhi	2020-2021	National	978-93-89885-95-8

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