Securing Distributed SDN Controller Network from Induced DoS Attacks

Shravanya G
Department of Computer Science and Engineering
PES University
Bengaluru, India
shravanya.g17@gmail.com

Swati N H
Department of Computer Science and Engineering
PES University
Bengaluru, India
swatinagaraj2@gmail.com

Ram P Rustagi
Department of Computer Science and Engineering
KS Institute of Technology
Bengaluru, India
rprustagi@ksit.edu.in

Oshin Sharma
Department of Computer Science and Engineering
PES University
Bengaluru, India
oshinsharma40@gmail.com

***Abstract*—With the escalation in security breaches on organizations and institutions that store, maintain and work with critical data, there is a need for a security-enhancing and risk-mitigating solution that works on the fly and is feasible to implement. Software Defined Networks is a networking paradigm that makes the network agile by disaggregating hardware and software. SDN helps enhance security with the help of micro-segmentation. The controller maintains a central view of the network, and its ability to monitor and store network information helps optimize routing. The centralization nature of the controller makes it vulnerable to DoS attacks which can be catastrophic for network functioning. The objective of this paper is to secure the distributed SDN controller architecture against DoS attacks. The proposed architecture is robust, scalable, and uses Big Data techniques to process streams of network traffic in real-time and Machine Learning to detect and mitigate DoS attacks.**

***Index Terms*—Software Defined Networks, DoS Attack, RyuController, Zodiac FX, Kafka, Storm**

I. Introduction

Software Defined Networking (SDN) is a state-of-the-art networking architecture that got traction on account of its features such as dynamism, manageability, cost-effectiveness and adaptability. These features make SDNs suitable to be used with big data, cloud computing and other similar networking services which demand high-bandwidth, dynamic architecture and improved performance which the traditional network paradigm fails to provide[1]. The SDN architecture is a three-layered architecture[2] consisting of data or infrastructure layer, control layer and application layer in the order as shown in Fig. 1 below. The data plane layer (or infrastructure layer) consists of the hardware components of the network and carries the responsibility of packet forwarding functionality. The control layer consists of the software components of the network which are responsible for installing flow tables and controlling the logic behind forwarding functionality. The entity which implements the control plane is called SDN Controller. The application layer refers to various network applications and services that govern forwarding functionality. The two layers - data plane and control plane layer represent the disaggregation between the hardware and software components of the network. The control layer provides a central view of the entire network topology and thus becomes the hub of central intelligence[3].

The implementation of network flows based on SDN paradigm is different from the network flows of the legacy networks owing to the three-layered architecture. In the SDN paradigm, the data plane processes all the traffic received from the hosts connected to it (SDN network infrastructure layer) and forwards as per flow tables. In the legacy network, there is no separation of control plane and data plane.

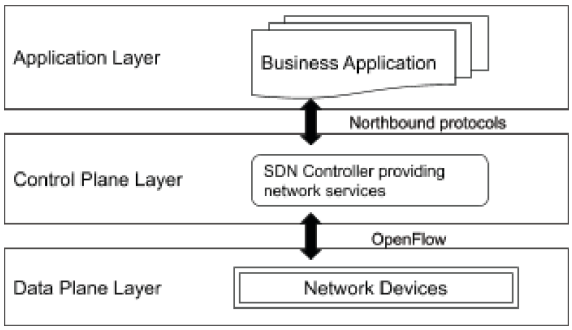

Fig. 1. Three-layered architecture of SDN

The data plane relies on the flow tables information received from the SDN controller (control plane layer) to carry out the packet forwarding functionality[4]. In case a flow table entry is not available for new traffic, the data plane sends OpenFlow[5] request messages to the SDN controller for new flows entries so that it can process this traffic and forward accordingly. The controller responds with applicable flow entries that are installed in the forwarding flow tables in the data plane enabling it to complete its forwarding functionality as shown in Fig. 2.

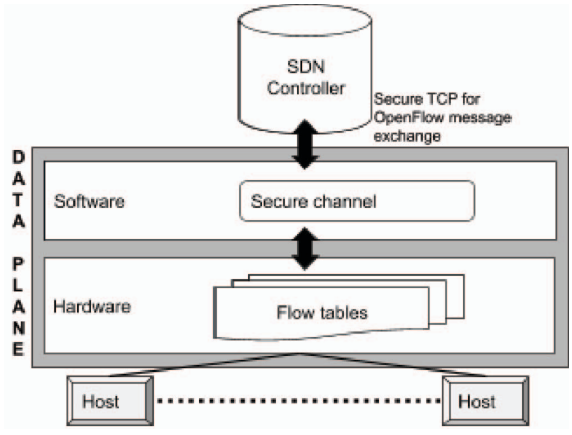

Fig. 2. OpenFlow communication between SDN switch and controller

978-1-7281-6334-5/19/$31.00 ©2019 IEEE
DOI 10.1109/CCEM48484.2019.000-4

Second International Conference on Smart Systems and Inventive Technology (ICSSIT 2019)
IEEE Xplore Part Number: CFP19P17-ART; ISBN:978-1-7281-2119-2

Plant leaf segmentation through connected pixel approach

Dr. Dayanand R B
Professor, Department of Computer Science,
KSIT, Bengaluru
Email-dayanandarb@ksit.edu.in

Daneshwari A Noola
Assistant Professor, Department of Information Science, BLDEACET, Vijayapura
Email- daneshwari_a@rediffmail.com

Abstract-Agricultural plays a significant role in human survival and it has become much more essential due to population increase and food demand, and hence the crop yield has to be produced according to the demand. However, one of the reason that quality and quantity of the crop gets compromised is the disease and in past various methodology has been proposed, however they lack on the various model metrics or the segmentation is achieved for the particular leaf, . In this paper, we have proposed a methodology named as SCPA (Segmentation through Connected Pixel Approach). The main objective of this paper is to achieve high accuracy segmentation. SCPA is the two step approach first we find the ROI(Region of Interest) of the particular leaf and in the second approach we find the instance based ROI i.e. for the whole plant, here both the step are performed simultaneously through incorporating one another. Moreover, SCPA is optimized iterative-based method and it is achieved through the approach of connected pixel approach. Connected pixels are the one where the edge of one pixel is connected to the other. When performed on the LSC dataset we achieve the accuracy of 95.10 %. This methodology is compared with the various state of art model and existing system by considering the model metric such as SBD, the results shows that SCPA model performs better than the other exiting method also the pictorial comparison of segmented leaf are shown and it shows our model identify it well when compared to others.

Keywords: ROI (Region of Interest), segmentation, Plant Leaf segmentation

1 INTRODUCTION

In recent survey, it is found that economy of India highly depends on the agricultural productivity. Moreover, this is one the reason where detecting the disease has become one of the eminent task in recent days [1]. Negligence in this area causes the serious issue to the plant and these results in compromise in quantity, quality and productivity of crop [2]. Moreover, the traditional method for detecting the plant disease is through the eye observation by experts, to do that one need big team of experts that can monitor the plant all the time. Traditional method does not work in efficient manner, as it is costly, hence

The automatic detection of disease is required as it is efficient, accurate and cheaper.

In plants, there are several visible disease such as colored spots scorch, bacterial and fungal disease. This type of disease are visible and can be detected through the image processing technique.

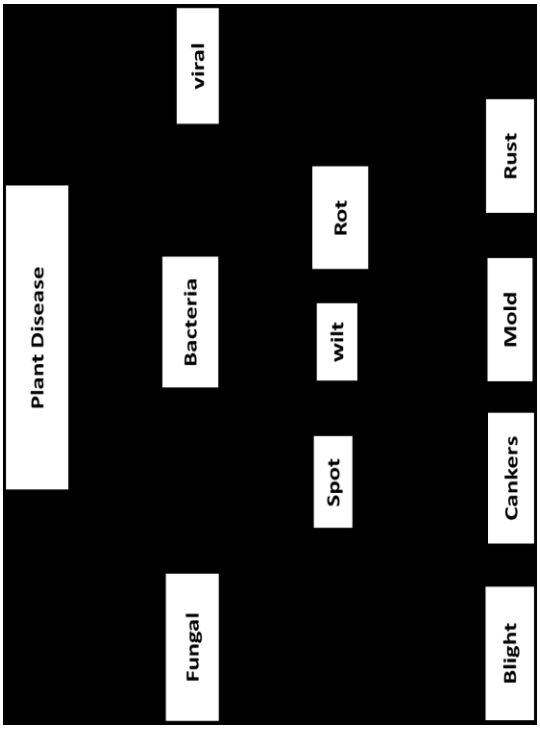

Figure 1 Types of plant Disease

The above diagram shows the different types of plant leaf disease, the figure shows the classification of various leaf disease. Moreover the plant disease caused due to the biotic agents.Plant disease are classified into three types based on the reason of the disease i.e. fungal, Bacteria and Viral. Moreover fungal is sub classified into various disease such as Blight, cankers, Mold and Rust whereas Bacteria is sub classified into disease such as spot wilt and root. All these disease causes the reduction in quality of the crops.

In order to detect the plant leaf disease, image-processing technique is one of the popular technique, which detects the disease accurately. Generally any image process follow 5 steps process to classify any

Second International Conference on Smart Systems and Inventive Technology (ICSSIT 2019)
IEEE Xplore Part Number: CFP19P17-ART; ISBN:978-1-7281-2119-2

Optimization of Hadoop MapReduce Model in cloud Computing Environment

Vaishali Sontakke
Research Scholar VTU,
Bengaluru.
Email- vaishalisntakke@rediffmail.com

Dr. Dayanand R B
Professor, Department of Computer Science,
KSIT, Bengaluru.
Email-dayanandarb@ksit.edu.in

Abstract-In recent years data analysis has become one of the trending topic among the researchers. Moreover, Information is the new baseline of all organization, as to grow the faster and bigger. Relevant information provides the flexibility to know the like and dislike of customer and to get the relevant information requires the analysis of huge information that is stored in various format. Hadoop constitutes of two basic model i.e. Hadoop Distributed File system (HDFS) and MapReduce, Hadoop is used for processing the huge amount of data whereas MapReduce is used for data processing. Hadoop MapReduce is one of the best platform for processing the huge data in efficient manner such as processing of web logs data. In this paper, we have proposed optimized HPMR (Hadoop MapReduce) model, which maximizes the memory utilization for the task and balances the performance between the I/O system and CPUs. HPMR contains the three phase i.e. Hadoop, Map and Reduce just like any other Hadoop model, however HPMR optimizes all three phase i.e. map, shuffle and reduce. Moreover, to optimize the memory model HPMR opts for dynamic terminology and input/output optimization is done through the dual operation. Moreover, in order to evaluate the performance of our model we have performed the Word-Count application on the Wikipedia data of size 128 Mb, 256 Mb, 512 Mb, 1 GB and 2 GB. The comparative analysis shows that our model optimizes nearly 30% better than the existing one.

Keyword: Optimized HPMR (Hadoop MapReduce) model, Hadoop MapReduce, HDFS (Hadoop Distributed File System).

1 INTRODUCTION

Cloud computing is one of the promising technology in the recent era that gives the demand service for analyzing, storing and processing of the data [1]. Moreover, in order to achieve the absolute scalability and achieve the better performance one needs the flexible distributed on the cloud environment. Big data helps in gathering the data and aggregating the huge amount of data to understand the data for the better decision making [2][3][4].

In recent the most popular approach for such big data analytics is used which is named as MapReduce [5] along with its implementation known as Hadoop. Hadoop allows the analyzing of data without any complexity and huge installations through the Virtual Machine and storage, which is hosted by the cloud. Hence, one can easily create the MapReduce virtually and cluster to analyze the data. Moreover, he MapReduce is used for parallel processing the data on various applications [6] [7]. MapReduce is a simple programming model which is used for processing the large dataset through two function i.e. Map () and Reduce ().

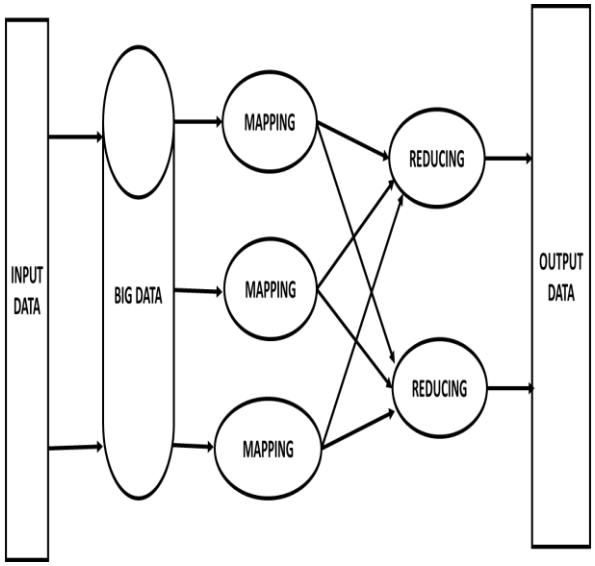

Figure 1 Hadoop MapReduce architecture

Figure 1 shows the Hadoop MapReduce architecture; here the Map function uses the pairs of (key, value) to generate the intermediate pairs (key, value). This pair act as the input to Reduce function for producing the final output. MapReduce constitutes two steps: MAP and Reduce. Map functions:

Step1: It reads the input as a problem and parts into the sub -problems.

Step2: Distributes the sub-problems to the worker node.

Step3: The worker node sends the outcome t the master node.

Proceedings of the Fourth International Conference on Communication and Electronics Systems (ICCES 2019)
IEEE Conference Record # 45898; IEEE Xplore ISBN: 978-1-7281-1261-9

An effective security protocol for GDS (group Data sharing) in Healthcare Cloud Environment

Uma Hombal
Department of CSE
Research Scholar, KSIT Bengaluru
uhombal@gmail.com

Dr. R. B. Dayananda
Department of CSE
KSIT, Bengaluru
rbdayanandakit@gmail.com

Abstract: **The data-sharing in cloud computing will enable many users to share the data. This helps in accessing the information easily and to share the data efficiently. The healthcare data will have to be shared amongst different healthcare centers and the medical practitioners. This involves security issues while sharing the healthcare data within a group. We provide the group model for sharing of data that is based on block based design where the group members will perform the key agreement to get the common group key that helps to shares the data securely. The fault tolerant property is provided by this design which can detect the malicious attackers during the group data sharing. The proposed group data-sharing is compared with the existing data sharing models w.r.t. the time cost of computation for group key generation and sharing of data.**

Keywords— Cloud computing, group data sharing, block based design, key agreement.

I. INTRODUCTION

The Personal health has been brought the great concern in modern residents. The population development and aging, the influence of health-care dictate and demands require for novel and the advanced solutions. At greater integration scale and lower cost, the availability of the computing re-sources has profited healthcare practices. With the help of development and success of the internet that plays an eminent role in maximizing the quality and access so the process is interrelated to the healthcare, which is determine the ICTs (Information of Communication Technologies) [1]. The E-health is defined as the ICTs application to the healthcare, which has come in normal use. While, these ICTs models can be considering many significance in the domain of healthcare, on top of the specific number of ICTs which is based on the emerged paradigm of health-care. There is a widespread use of electronic health record (EHR) [2]. Cloud computing is one of the popular health-IT infrastructures for facilitating EHR sharing. Healthcare providers and all the insurance companies store the electronic medical records in centralized databases .This includes maintaining health records, monitoring of patients etc.

The E-health can be widely defined as the ICTs application to the healthcare that has come in normal use. The co-operation between specialists in terms of the health experts, who can be working together efficiently, and generated their management in sharing and activities their information about the victim easier and in normal manner, and thus they can give cure to the patients. The systems of health are enable for citizen to have control their own health. However, there are security and privacy issues related to the health-care data. The security and privacy protection of cross-institutional electronic patient records is of major importance. The major concern is security in EHR networked systems and for communicating patient data. Here the physical security, network security, application security, internal systems security, secure data-backup strategy, secure internal policies and procedures, third-party certification are considered.

In this paper, our aim is to confirm the security of information sharing within a group in health care cloud security network. Here multiple data owners can freely share the outsourced data with high security. The entity authentication services are provided. The fault detection and fault tolerance is performed to identify the malicious user. We present the block design based key agreement protocol by extending the structure of the symmetric block design to support multiple participants. It enables multiple data owners to freely share the outsourced data. Here the adaptive symmetric block design is constructed as the group data-sharing model to support group data sharing in cloud computing. Here each group member performs the key agreement to derive a common group key to ensure the security of the outsourced group data. The help of group members can produce the normal group key. The semi-trusted and attackers of cloud server has no access to create the key. Cloud Security Service Third Party Verifier takes responsibility for the cloud storage auditing and key updates.

This paper is organized in such a way in section-II Literature survey, section- III described our proposed method, in section- IV, evaluation and medical outcome that is represented and in section- V conclusion.

International Conference on Innovative Research in Engineering, Management and Sciences
International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2019 IJSRCSEIT | Volume 4 | Issue 9 | ISSN : 2456-3307

Enhancement of Signature Schemes for Heightening Security in Blockchain

Prof M ShanmugamShoba*[1], Dr. Rekha B Venkatapur[2]
*[1]Senior Assistant Professor, Information Science & Engineering Department, NHCE, Bangalore, India
[2]Professor & Head, CSE, KSIT, Bengaluru, India
reach2shobhamahe@gmail.com/mshanmugams@newhorizonindia.edu[1]

ABSTRACT

Blockchain has become one of the most pioneering technologies, with the rise of Bitcoin, blockchain which is the core technology of Bitcoin has received increasing attention. There are multiple signature scheme based on digital signature schemes that supports making signatures on many different messages generated by many different users, the size of the signature could be shortened by compressing multiple signatures into a single signature. Based on the blockchain architecture and existing Merkle tree based signature schemes, In this paper, an analysis of how to enhance the signature schemes to secure the transactions on blockchain based on extensible post-quantum (PQ) resistant digital signature scheme best suited to blockchain and distributed ledger technologies is proposed.

I. INTRODUCTION

Recent advances in quantum computing and the threat this poses to classical cryptography has increased the interest in PQ research. More specifically, due to Shor's algorithm [1], a quantum computer could easily factor a big integer in polynomial time, thus effectively break RSA. Implementations of Shor's algorithm can also solve discrete logarithms and render today's digital signatures, such as DSA, ECDSA and EdDSA, useless[2].

The race to build quantum computers has already begun and companies like Google, Microsoft, IBM, D-Wave and Intel are at the forefront. That being said, we have yet to build a computer with the thousands of stable qubits that are required to make classical public key cryptography obsolete. However, there is significant progress in the field and some optimistic predictions estimate that a large quantum computer capable of breaking asymmetric cryptography might be available in the next10to20years[3],[4].

The security impact of breaking public key cryptography would be tremendous, as almost everything from HTTPS, VPN and PKI in general, is basing their authentication, key exchange and digital signatures on the security of RSA or Elliptic Curve Cryptography (ECC). Blockchains would be hit equally hard resulting in broken keys that hold coins/assets, and would perhaps be one of the most affected sectors because there is economic incentive for hackers to get access to blockchain accounts anonymously.

To address the concern of compromised keys, PQ cryptog- raphy is dealing with the design and evaluation of systems that will survive the quantum

DE GRUYTER

Surekha Borra, Nilanjan Dey, Siddhartha Bhattacharyya, Mohamed Salim Bouhlel

INTELLIGENT DECISION SUPPORT SYSTEMS

APPLICATIONS IN SIGNAL PROCESSING

FRONTIERS IN COMPUTATIONAL INTELLIGENCE

DE
G

Secrecy Capacity of Symmetric Keys Generated by Quantising Channel Metrics Over a Fading Channel

Chapter · January 2020 *with* 12 Reads
DOI: 10.1007/978-3-030-33846-6_45
In book: Inventive Computation Technologies, pp.404-413


L. Srividya


Sudha P N
2.28 · K S institute of Technology, Bangalore,India

Abstract

Physical layer security has become the cornerstone of the wireless communication system. Key generation by channel estimation enables legitimate users to generate keys in a decentralised manner than sharing secret information in open wireless mediums. In this paper we propose secrecy evaluation of symmetric keys which are, generated by channel metrics estimated over the Rayleigh fading channel, encrypted and transmitted over a fading channel in the presence of an eavesdropper. The results are obtained in terms of secrecy capacity and outage probability for various key sizes, different position of eavesdroppers from the source. It is seen that as key size increases and distance of eavesdropper increases from the source the secrecy capacity increases. Also the performance of keys derrived from various channel metrics such as complex channel path gains, EVM rms and complex phase difference are discussed in this paper.

70

CERTIFICATE OF PARTICIPATION

This is to certify that

Dr.P.N.Sudha

has presented the paper entitled

Secrecy Capacity of Symmetric Keys Generated by Quantising Channel Metrics Over a Fading Channel

in the 4th International Conference on Inventive Computation Technologies (ICICT - 2019), organized by RVS Technical Campus during August 29 - 30, 2019 at Coimbatore, India.

Session Chair

Conference Chair
Dr. S. Smys

Director
Dr. V. Robinson

Springer

Dayananda Sagar University

3rd INTERNATIONAL CONFERENCE ON INTELLIGENT COMPUTING AND COMMUNICATION (ICICC-2019)

7th & 8th JUNE, 2019

Organized by

Department of Computer Science and Engineering,

School of Engineering, Dayananda Sagar University, Bengaluru, India.

CERTIFICATE OF APPRECIATION

This is to certify that Prof./Dr./~~Mr.~~/Ms. Surekha Bora

of K.S. Institute of Technology *participated and presented a paper titled* Secured Anti-Piracy Screen.

in ICICC-2019 held at Dayananda Sagar University, Bengaluru, India.

Dr. S. C. Satapathy
General Chair

Dr. M. K. Banga
Organizing Chair

A T M E
College of Engineering

INTERNATIONAL CONFERENCE
on Recent Trends in Science & Technology
Date: 17th & 18th June 2020
(ICRTST - 2020)

ICRTST 2020

CERTIFICATE

This is to certify that Mr/Mrs/Ms/Dr/Prof *S Christo Jain*

Visvesvaraya Technological University (VTU)

has presented paper entitled *Proposal of Wireless Power Transfer System with array of Aerial for short distance applications*

in the "INTERNATIONAL CONFERENCE on Recent Trends in Science & Technology (ICRTST - 2020)" organized by ATME College of Engineering, Mysuru held on 17th and 18th June 2020.

Dr. Parthasarathy L
Organizing Chair, ICRTST-2020
Professor & Head
Dept. of EEE, ATMECE, Mysuru

Dr. Basavaraj L
Principal
ATMECE, Mysuru

CERTIFICATE OF PRESENTATION

This is to certify that

S.Christo Jain

has successfully presented a paper entitled

Proposal of a cost-effective wireless Power Transfer system from Solar using Aerial Technology

in the 4th ***International Conference on Trends in Electronics and Informatics (ICOEI 2020)*** *organised by SCAD College of Engineering and Technology, Tirunelveli, Tamil Nadu, India during 15-17, June 2020.*

SESSION CHAIR

ORGANIZING SECRETARY
Dr. I. Jeena Jacob

CONFERENCE CHAIR
Dr. P. Ebby Darney

A Survey on Machine Learning enabled SWARM robots for Autonomous and Precision Agriculture

Sampath Kumar.S, Research Scholar, KSIT, Bangalore, India
ShanthiPrasad.M.J, Professor, CITech. North Campus, Bangalore, India

Abstract:--

Machine learning has evolved with high performing computing algorithms along with Robotics and Artificial intelligence technologies. SWARM robotic system is a diligence of multi robot intelligence with collaborative communication approach. SWARM robots play a major role in precision agriculture. SWARM robots mainly focus on aspects like coordination, decentralized control and self organization. These technologies have created new opportunities in multidisciplinary agricultural domain. Integration of Machine learning principles with SWARM robotics will form a novel solution to make agricultural practice even more intelligent and accurate. In this paper, we present a comprehensive review of research related to adoption Machine learning principles in precision agriculture for various autonomous agricultural activities using SWARM robots.

Keywords:--

SWARM Robots, Precision Agriculture, Self Learning, Decision Tree, Random Forest, Knn Algorithm, Sowing, irrigation

IEEE Bangalore Section

NAGARJUNA College of Engineering & Technology

GLOBAL CONFERENCE FOR ADVANCEMENT IN TECHNOLOGY
(Technically Co-Sponsered by IEEE Bangalore Section)

CERTIFICATE OF PRESENTATION

This Certificate is proudly presented to

Mr/Ms. ARUNA RAO B.P

From

KSIT , BANGALORE

for presenting paper entitled

"DESIGN AND MODELING OF INPUT OUTPUT FUNCTIONALITIES OF FPGA BASED IO BLOCK"

" GLOBAL CONFERENCE FOR ADVANCEMENT IN TECHNOLOGY "
Bangalore , India 18th - 20th October , 2019

Dr. Shantakumar B Patil
(General Chair)

Organised by : NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY , BENGALURU

Geetha Shishu Shikshana Sangha (R)

GSSS Institute of Engineering & Technology for Women

Accredited with Grade A by NAAC

Accredited Branches by NBA, New Delhi UG – ECE, CSE, ISE, TE & IT

(Validity: 01.07.2017 - 30.06.2020)

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi & Govt. of Karnataka)

Mysuru-570 016 | Karnataka | India

IEEE BANGALORE SECTION

PARTICIPATION

This is to certify that Dr./Prof./Mr./Ms.

Aruna Rao B P

has Participated/Presented Paper titled

Design and delay Analysis of Various 256-Bit Adders Using Verilog

in the 4th IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2019), organized by GSSS Institute of Engineering & Technology for Women, Mysuru in association with IEEE Bangalore Section on 13th & 14th December 2019.

Dr. Parameshachari B D
Publication Chair, ICEECCOT-2019
Professor & Head,
Dept. of TCE

Dr. Reshma Banu
Organizing Chair, ICEECCOT-2019
Professor & Head,
Dept. of ISE.

Dr. Shivakumar M
General Chair, ICEECCOT-2019
Principal
GSSSIETW, Mysuru

ICEECCOT 2019

4th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques

Geetha Shishu Shikshana Sangha (R)

GSSS Institute of Engineering & Technology for Women

Accredited with Grade A by NAAC

Accredited Branches by NBA, New Delhi UG – ECE, CSE, ISE, TE & IT

(Validity: 01.07.2017 - 30.06.2020)

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi & Govt. of Karnataka)

Mysuru-570 016 | Karnataka | India

IEEE BANGALORE SECTION

PARTICIPATION

This is to certify that Dr./Prof./Mr./Ms.

Aruna Rao B P

has Participated/Presented Paper titled

Design and implementation of 256 * 256 Booth Multiplier and its applications

in the 4th IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2019), organized by GSSS Institute of Engineering & Technology for Women, Mysuru in association with IEEE Bangalore Section on 13th & 14th December 2019.

Dr. Parameshachari B D
Publication Chair, ICEECCOT-2019
Professor & Head,
Dept. of TCE

Dr. Reshma Banu
Organizing Chair, ICEECCOT-2019
Professor & Head,
Dept. of ISE.

Dr. Shivakumar M
General Chair, ICEECCOT-2019
Principal
GSSSIETW, Mysuru

ICEECCOT 2019

4th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques

Geetha Shishu Shikshana Sangha (R)

GSSS Institute of Engineering & Technology for Women

Accredited with Grade A by NAAC

Accredited Branches by NBA, New Delhi UG – ECE, CSE, ISE, TE & IT

(Validity: 01.07.2017 - 30.06.2020)

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi & Govt. of Karnataka)

Mysuru-570 016 | Karnataka | India

IEEE BANGALORE SECTION

PARTICIPATION

This is to certify that Dr./Prof./Mr./Ms.

Aruna Rao B P

has Participated/Presented Paper titled

High Speed Multipliers and Complex Summers

in the 4th IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2019), organized by GSSS Institute of Engineering & Technology for Women, Mysuru in association with IEEE Bangalore Section on 13th & 14th December 2019.

Dr. Parameshachari B D
Publication Chair, ICEECCOT-2019
Professor & Head,
Dept. of TCE

Dr. Reshma Banu
Organizing Chair, ICEECCOT-2019
Professor & Head,
Dept. of ISE.

Dr. Shivakumar M
General Chair, ICEECCOT-2019
Principal
GSSSIETW, Mysuru

ICEECCOT 2019

4th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques

Geetha Shishu Shikshana Sangha (R)

GSSS Institute of Engineering & Technology for Women

Accredited with Grade A by NAAC

Accredited Branches by NBA, New Delhi UG – ECE, CSE, ISE, TE & IT

(Validity: 01.07.2017 - 30.06.2020)

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi & Govt. of Karnataka)

Mysuru-570 016 | Karnataka | India

IEEE BANGALORE SECTION

PARTICIPATION

This is to certify that Dr./Prof./Mr./Ms.

Aruna Rao B P

has Participated/Presented Paper titled

Design and implementation of reversable computational circuits by creating libraries of Basic gates using verilog HDL

in the 4th IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2019), organized by GSSS Institute of Engineering & Technology for Women, Mysuru in association with IEEE Bangalore Section on 13th & 14th December 2019.

Dr. Parameshachari B D
Publication Chair, ICEECCOT-2019
Professor & Head,
Dept. of TCE

Dr. Reshma Banu
Organizing Chair, ICEECCOT-2019
Professor & Head,
Dept. of ISE.

Dr. Shivakumar M
General Chair, ICEECCOT-2019
Principal
GSSSIETW, Mysuru

ICEECCOT 2019

4th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques

DAYANANDA SAGAR UNIVERSITY

SCHOOL OF ENGINEERING

Kudlu Gate, Hosur Road, Bengaluru – 560068, India

ATMA 2019

In Association with

ELSEVIER

AIP American Institute of Physics

CERTIFICATE

This is to certify that ~~Dr~~/Mr/~~Ms~~/ HARISH. U has participated/presented a paper entitled Effect of the Coating Material Compositions on the life of gas turbine hot section Components in the **International Conference on Advanced Trends In Mechanical And Aerospace Engineering (ATMA-2019)** jointly organized by Department of Mechanical & Aerospace Engineering, Dayananda Sagar University, Bengaluru, during November 7-9, 2019.

Dean, SOE-DSU

Pro-Vice Chancellor, DSU

Vice Chancellor, DSU