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## List of books and chapters in edited volumes published during 2018 - 2019 Year

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1	Muthuramalingam S., Nisha Angeline C.V., Lavanya R.	Lightweight secure architectural framework for internet of things	9781522582427; 9781522582410	<a href="#">View Document</a>
2	Vinodhini R., Suganya R., Karthiga S., Priyanka G.	Literature Survey on DNA Sequence by Using Machine Learning Algorithms and Image Registration Technique	9789811302763; 9789811302770	<a href="#">View Document</a>
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S. Geetha and Asnath Vicky Phamila

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Computing (CDAC), India*

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## Lightweight Secure Architectural Framework for Internet of Things

**Muthuramalingam S.**

*Thiagarajar College of Engineering, India*

**Nisha Angeline C. V.**

*Thiagarajar College of Engineering, India*

**Raja Lavanya**

*Thiagarajar College of Engineering, India*

### ABSTRACT

*In this IoT era, we have billions of devices connected to the internet. These devices generate tons of data that has to be stored, processed, and used for making intelligent decisions. This calls for the need for a smart heterogeneous network which could handle this data and make the real-time systems work intelligently. IoT applications leads to increasing demands in high traffic volume, M2M communications, low latency, and MIMO operations. Mobile communication has evolved from 2G voice services into a complex, interconnected environment with multiple services built on a system that supports innumerable applications and provides high-speed access. Hence the sustainability of the IoT applications do rely on next generation networks. Due to the significant increase in the network components, computational complexity, and heterogeneity of resources, there arise the need for a secure architectural framework for internet of things. For this, the authors propose a secure architectural framework for IoT that provides a solution to the lightweight devices with low computational complexity.*

DOI: 10.4018/978-1-5225-8241-0.ch008

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### Abstract

The DNA sequence is significantly utilized as a part of a field in medicinal information investigation. It comprehends the inward structure of qualities in the DNA. It comprehends which arrangement codes for what sort of proteins. Analysis of DNA sequences is important in preventing the evolution of viruses,

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## Author information

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Authors and Affiliations

**Department of Information Technology,  
Thiagarajar College of Engineering, Madurai,  
Tamil Nadu, India**

R. Vinodhini, R. Suganya, S. Karthiga & G. Priyanka

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### Abstract

The Polycystic Ovary Syndrome (PCOS) is an endocrine abnormality; it affects females during their reproductive cycle. It is hormone imbalance of female and it skips the menstrual cycle and makes it harder to get pregnant. The side effects of PCOS are causing blood pressure, heart disease, diabetes, obesity, etc. Thus, there is an imbalance in hormone

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## Author information

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Authors and Affiliations

**Department of Information Technology,  
Thiagarajar College of Engineering, Madurai,  
Tamil Nadu, India**

R. Vinodhini & R. Suganya

Corresponding author

Correspondence to [R. Vinodhini](#).

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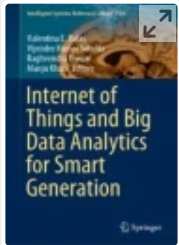
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## About this book


This book discusses emerging technologies in the field of the Internet of Things and big data, an area



**Internet of Things and Big Data Analytics for Smart Generation** pp 279–300

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## IoT Based Intelligent Transportation System (IoT-ITS) for Global Perspective: A Case Study

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### Abstract

Big data analytics helps in analyzing a huge set of data whereas IoT is about data, devices and connectivity. Internet of Things (IoT) involves connecting physical objects to the Internet to build smart systems and universal mobile accessibility advanced technologies like Intelligent Transportation System (ITS). IoT solutions are playing a major role in driving the global IoT in

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## Author information

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Authors and Affiliations

**Department of Information Technology,  
Thiagarajar College of Engineering, Madurai,  
India**

S. Muthuramalingam

**Department of Information Technology, Bannari  
Amman Institute of Technology,  
Sathyamangalam, India**

A. Bharathi

**Department of Computer Science and  
Engineering, PTR College of Engineering and  
Technology, Assistant Professor, Department of  
Information Technology, Thiagarajar College of  
Engineering, Madurai, India**

S. Rakesh kumar & N. Gayathri

**Assistant Professor, Department of Information  
Technology, G.G.R. College of Engineering, Anna  
University, Chennai, India**

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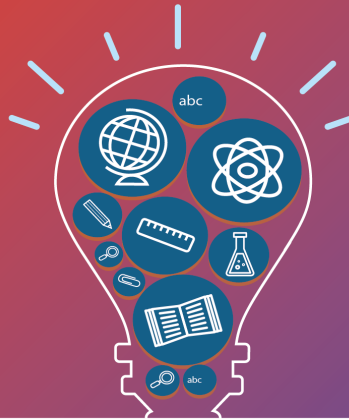
**School of Computing Science and Engineering,  
Galgotias University, Greater Noida, India**

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Corresponding author

Correspondence to [B. Balamurugan](#).

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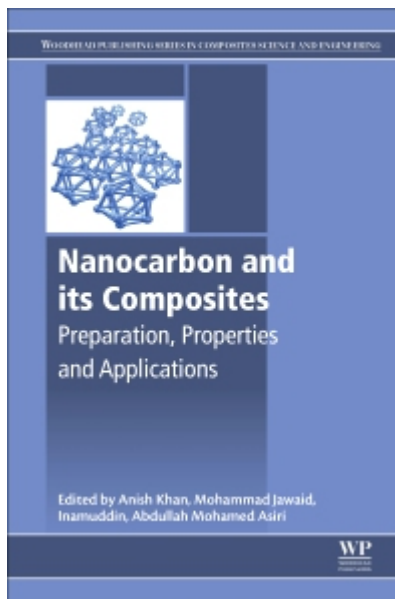
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[\\*abiramiam@tce.edu](mailto:*abiramiam@tce.edu)

Learners of countryside background, face different types of problems and challenges when they do their higher education in urban areas. Their culture, custom, and the way they had been taught in their schools are entirely different. These differences are the major concern for some students and they usually perform low in their higher education. It results in de-motivation of individual and impacts their overall performance. Only very few students cope-up with the new environment (College) and adapt to it.

The Computing domain is the vast changing field in this internet and mobile era. This field contains different computer hardware and software related courses for the students to complete their graduation in Computing or Information technology domain. All software recruiting companies look for candidates who outperform well in the technical round. All basic or foundation core courses have to be taught to students in such a way that they learn all the concepts and relate them to real time requirements and applications. Traditional classroom teaching method may not suffice this requirement. Also, there won't be enough time to train the students again on these concepts before

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# Graphene-based nano metal matrix composites: A review

6

Rajesh Jesudoss Hynes Navasingh<sup>\*</sup>, Ramar Kumar<sup>†</sup>, Kathiresan Marimuthu<sup>‡</sup>, Senthamaraikannan Planichamy<sup>§</sup>, Anish Khan<sup>¶,||</sup>, Abdullah Mohamed Asiri<sup>‡,||</sup>, Mohammad Asad<sup>¶,||</sup>

<sup>\*</sup>Department of Mechanical Engineering, Mepco Schlenk Engineering College (Autonomous), Sivakasi, Tamil Nadu, India, <sup>†</sup>Department of Mechanical Engineering, Vels Institute of Science, Technology & Advanced Studies, Pallavaram, Chennai, India

<sup>‡</sup>Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India, <sup>§</sup>Department of Mechanical Engineering, Kamaraj College of Engineering and Technology, Virudhunagar, India, <sup>¶</sup>Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia, <sup>||</sup>Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah, Saudi Arabia

## Chapter Outline

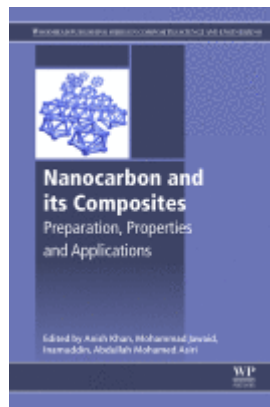
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## 6.1 Introduction

Generally, the idea to improve the mechanical strength of materials has been achieved effectively by introducing second-phase reinforcement particles into the materials. Many researchers all over the world have utilized this approach to enhance mechanical characteristics such as tensile strength, compression strength, bending strength, toughness, hardness, etc. Although the above research efforts have provided the highly desirable output, the development of cost-effective manufacturing techniques of metal matrix composites is still an unresolved problem. In this context, searching for new reinforcing materials as nanofillers in metal-matrix composites has vital importance. For examining new reinforcement materials, the following key elements

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# Nanocarbon and its Composites

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## 27 - Synthesis, properties, and characterization of carbon nanotube-reinforced metal matrix composites

N. Rajesh Jesudoss Hynes \*, R. Sankaranarayanan \*, M. Kathiresan †, P. Senthamarai ‡, Anish Khan § ¶, Abdullah Mohamed Asiri § ¶, Imran Khan ||

\* Department of Mechanical Engineering, Mepco Schlenk Engineering College (Autonomous), Sivakasi, Tamil Nadu, India

† Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India

‡ Department of Mechanical Engineering, Kamaraj College of Engineering and Technology, Virudhunagar, Tamil Nadu, India

§ Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

¶ Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah, Saudi Arabia

|| Applied Science and Humanities Section, University Polytechnic, Faculty of Engineering and Technology, Aligarh Muslim University, Aligarh, India

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### Abstract

This chapter deals with reinforcement materials called carbon nanotubes (CNTs) in the metal matrix-based composites. The chapter starts with CNT's history, followed by the synthesis, characterization, and mechanics of CNTs. The application purpose of the CNT as far as reinforcement is concerned in the metal-based matrix medium in the process of CNT fabrication is discussed here. This chapter includes discussion on the different fabrication techniques along with mechanical and thermal influences in terms of properties over the composites. A carbon nanotube exceeds s diamond with its higher thermal conducting property. Apart from the thermal conducting excellence, CNTs also possess distinct electronic properties. In addition to these superiorities, mechanical properties such as strength, resilience, and stiffness are far better than contemporary materials. The phenomenal mechanical properties along with the lower density level of CNT enhance its chances to be the most preferred reinforcement material. The promising potential of CNT-reinforced metal matrix composites provides exceptional specific stiffness with uncompromising strength. Thus, the application spectrum of these materials increases in the present as well the future. With all these put together, this can be an ultimate candidate for developing entirely new materials with CNTs as reinforcement material. This chapter would add positivity toward the higher presence of CNTs in manufacturing fields especially in the composite segment for different and wide applications.



Nanotechnology in the Life Sciences



Ram Prasad  
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## Oxide Nanomaterials for Efficient Water Treatment



Alagappan Subramaniyan

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### 13.1 Introduction: Some Interesting Facts on Depleting Water and Water Treatment Methods

There is an acute shortage of drinking water with close to 42% of the total world population lacking access to clean and safe drinking water since 2005. According to WHO/UNICEF recent reports nearly 663 million people around the world do not

A. Subramaniyan (✉)  
Department of Physics, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India  
e-mail: [alsphy@tce.edu](mailto:alsphy@tce.edu)

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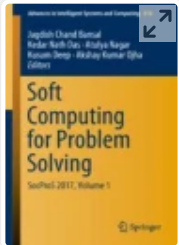
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## A Genetic-Based Bayesian Framework for Stateless Group Key Management in Mobile Ad Hoc Networks

[V. S. Janani](#)  & [M. S. K. Manikandan](#)

Conference paper | [First Online: 14 December 2018](#)

**771** Accesses | **1** Citations

Part of the [Advances in Intelligent Systems and Computing](#) book series (AISC, volume 816)

### Abstract

This paper addresses the issue in managing a group key among dynamic group of nodes in mobile ad hoc networks (MANETs), where the participants frequently miss the group key update, commonly known as rekeying. In this paper, we propose a broadcast stateless and distributed group key management (GKM) framework: genetic-based Bayesian networks group key agreement (GBKA) scheme, for supporting dynamic rekeying

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## Author information

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Authors and Affiliations

**Department of ECE, Thiagarajar College of Engineering, Madurai, 15, India**

V. S. Janani & M. S. K. Manikandan

Corresponding author

Correspondence to [V. S. Janani](#).

Editor information

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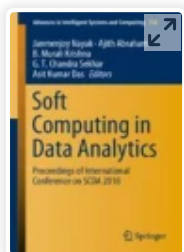
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# Soft Computing in Data Analytics

Proceedings of International  
Conference on SCDA 2018

 Springer





**Soft Computing in Data Analytics** pp 237–245

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## RAID-6 Code Variants for Recovery of a Failed Disk

[M. P. Ramkumar](#) , [N. Balaji](#), [G. S. R. Emil Selvan](#) & [R. Jeya Rohini](#)

Conference paper | [First Online: 22 August 2018](#)

**815** Accesses | **5** Citations

Part of the [Advances in Intelligent Systems and Computing](#) book series (AISC, volume 758)

### Abstract

With the increasing demand for capacity, speed, and reliability in large-scale storage systems, a mechanism should exist to ensure the data availability. Though there exist kinds of erasure code implementations in RAID-6, maximum distance separable (MDS) codes provide simple yet better way of data protection and recovery mechanism in the course of a disk failure. RAID-6 is preferred due to the capability of fault tolerance

Janmenjoy Nayak

**Machine Intelligence Research Labs (MIR Labs),  
Scientific Network for Innovation and Research  
Excellence, Washington, USA**

Ajith Abraham

**Department of Mechanical Engineering, Sri  
Sivani College of Engineering, Srikakulam,  
Andhra Pradesh, India**

B. Murali Krishna

**Department of Electrical and Electronics  
Engineering, Sri Sivani College of Engineering,  
Srikakulam, Andhra Pradesh, India**

G. T. Chandra Sekhar

**Department of Computer Science and  
Technology, Indian Institute of Engineering  
Science and Technology (IIST), Shibpur,  
Howrah, West Bengal, India**

Asit Kumar Das

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Cite this paper

Ramkumar, M.P., Balaji, N., Emil Selvan, G.S.R., Jeya Rohini,  
R. (2019). RAID-6 Code Variants for Recovery of a Failed

Disk. In: Nayak, J., Abraham, A., Krishna, B., Chandra Sekhar, G., Das, A. (eds) Soft Computing in Data Analytics . Advances in Intelligent Systems and Computing, vol 758. Springer, Singapore. [https://doi.org/10.1007/978-981-13-0514-6\\_24](https://doi.org/10.1007/978-981-13-0514-6_24)

[.RIS](#)  [.ENW](#)  [.BIB](#) 

DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-981-13-0514-6_24">https://doi.org/10.1007/978-981-13-0514-6_24</a>	22 August 2018	Springer, Singapore

Print ISBN	Online ISBN	eBook Packages
978-981-13-0513-9	978-981-13-0514-6	<a href="#">Intelligent Technologies and Robotics</a> <a href="#">Intelligent Technologies and Robotics (R0)</a>

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# VLSI Design and Test

22nd International Symposium, VDAT 2018  
Madurai, India, June 28–30, 2018  
Revised Selected Papers

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S. Rajaram · N. B. Balamurugan ·  
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S. Rajaram  
Thiagarajar College of Engineering  
Madurai, India

D. Gracia Nirmala Rani  
Thiagarajar College of Engineering  
Madurai, India

N. B. Balamurugan  
Thiagarajar College of Engineering  
Madurai, India

Virendra Singh  
Indian Institute of Technology Bombay  
Mumbai, India

ISSN 1865-0929 ISSN 1865-0937 (electronic)  
Communications in Computer and Information Science  
ISBN 978-981-13-5949-1 ISBN 978-981-13-5950-7 (eBook)  
<https://doi.org/10.1007/978-981-13-5950-7>

Library of Congress Control Number: 2018967043

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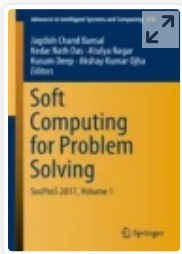
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# Soft Computing for Problem Solving

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# A Genetic-Based Bayesian Framework for Stateless Group Key Management in Mobile Ad Hoc Networks

[V. S. Janani](#)  & [M. S. K. Manikandan](#)

Conference paper | [First Online: 14 December 2018](#)

**772** Accesses | **1** Citations

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## Abstract

This paper addresses the issue in managing a group key among dynamic group of nodes in mobile ad hoc networks (MANETs), where the participants frequently miss the group key update, commonly known as rekeying. In this paper, we propose a broadcast stateless and distributed group key management (GKM) framework: genetic-based Bayesian networks group key agreement (GBKA) scheme, for supporting dynamic rekeying



## About this paper

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### Cite this paper

Janani, V.S., Manikandan, M.S.K. (2019). A Genetic-Based Bayesian Framework for Stateless Group Key Management in Mobile Ad Hoc Networks. In: Bansal, J., Das, K., Nagar, A., Deep, K., Ojha, A. (eds) Soft Computing for Problem Solving. Advances in Intelligent Systems and Computing, vol 816. Springer, Singapore. [https://doi.org/10.1007/978-981-13-1592-3\\_33](https://doi.org/10.1007/978-981-13-1592-3_33)

[.RIS](#)  [.ENW](#)  [.BIB](#) 

DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-981-13-1592-3_33">https://doi.org/10.1007/978-981-13-1592-3_33</a>	14 December 2018	Springer, Singapore

Print ISBN	Online ISBN	eBook Packages
978-981-13-1591-6	978-981-13-1592-3	<a href="#">Intelligent Technologies and Robotics</a> <a href="#">Intelligent Technologies and Robotics (R0)</a>

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# VLSI Design and Test

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VDAT 2018: **VLSI Design and Test** pp 695–704

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## Design of CMOS Based Biosensor for Implantable Medical Devices

[G. Giftha](#) , [D. Gracia Nirmala Rani](#), [Nifasath Farhana](#) & [R. Archana](#)

Conference paper | [First Online: 25 January 2019](#)

**1234** Accesses | **3** Citations

Part of the [Communications in Computer and Information Science](#) book series (CCIS, volume 892)

### Abstract

In the recent years medical potential of Implantable Medical Devices (IMD) has attracted increasing attention of surgical methods to improve the human health care. IMD is used as diagnostic or therapeutic devices. It is fabricated to replace the missing biological structure or improving the functioning of damaged biological structure. Bio sensor is a major block present in an implantable device it is an analytical device used for the

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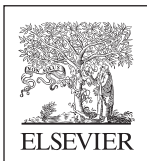
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# Application of Evolutionary Algorithm for Multiobjective Transformer Design Optimization

S. Tamil Selvi<sup>\*</sup>, S. Baskar<sup>†</sup> and S. Rajasekar<sup>‡</sup>

<sup>\*</sup>SSN College of Engineering, Kalavakkam, India, <sup>†</sup>Thiagarajar College of Engineering, Madurai, India, <sup>‡</sup>NEC Asia Pacific Pte. Ltd, Singapore

## 1 INTRODUCTION

### 1.1 Need for Energy Efficient Transformer Design

#### 1.1.1 High Aggregate Total Losses

Electric power typically passes through six to eight transformer units before being utilized. Although, all Distributed Transformers (DTs) have high efficiencies, a large total loss of energy results, due to the large quantity of DTs. Energy losses throughout the world's electrical distribution networks amount to 1279 TWh [1]. Transmission lines contribute most of these losses. After transmission lines, transformers are the loss-making components and there is a cumulative effect of losses in the transformers, which adds up to a significant amount of electricity.

#### 1.1.2 High Economic Cost

Transformer losses in the form of heat not only reduce the transformer life by causing damage to the insulation, but also constitute a significant amount of economic cost. Many countries have realized this fact and a study conducted in United States shows that transformer losses are estimated to be 2%–3% of the total electric energy, accounting for approximately to 25 billion dollars annually [2]. So, finding ways to decrease the transformer losses is one of the important factors toward reducing the failure rate and costs.

In deregulated electricity markets, as the price of electrical energy varies every hour, so does the cost of transformer losses. The seasonal load variations

also increase the benefits associated with efficient transformers, particularly if the season of maximum load is coincident with the maximum energy prices. As the system investment and energy costs continue to increase, electric utilities are more and more interested in installing energy-efficient transformers at their distribution networks.

### 1.1.3 High Total Life Time Cost

Energy efficient transformers are more expensive but use less energy, resulting in lower transformer Total life time cost (TLTC) than less energy efficient transformers. TLTC is the total life cycle cost, which considers the future operating costs of a unit over its lifetime, brought back into present day cost and then added to its total purchase price. Transformers with low TLTC possess low losses and are expected to have longer life. Selecting Energy Efficient Distribution Transformers “SEEDT” project [3] also concluded that electricity distribution companies and commercial and industrial users should use the TLTC method for making transformer purchasing decisions.

### 1.1.4 More Greenhouse Gas Emissions

Energy-efficient transformers have reduced total losses, i.e., reduced load and no-load losses. Energy-efficient transformers reduce energy consumption and consequently reduce the generation of electrical energy to accommodate these losses and thereby the greenhouse gas emissions. European Copper Institute studies indicated that improving energy efficiency of existing European stock of transformers by 40% would result in about 22TWh annual energy savings, which is equivalent to annual reduction in green house gas (GHG) emissions of about 9 million tonnes of CO<sub>2</sub>. As per the statistics taken in September 2012 [4], India alone contributes 6% of the total CO<sub>2</sub> emissions in world. One-third of the CO<sub>2</sub> emissions in India are due to electricity generation and heat. Reduction of GHG emission is becoming topical issue due to the growing concern for global warming and climate change. Actions that can immediately reduce GHG emissions and cost for an electric utility are the use of energy efficient transformers and renewable energy sources. But disadvantages with renewable energy are (i) difficult to generate large quantities of required electricity; (ii) reliability of supply, as they often rely on the weather (which is unpredictable and inconsistent) for its source of power; and (iii) the high cost of installation for renewable energy technology. All the above problems drive the use of fossil fuel and the only alternative to reduce the CO<sub>2</sub> emissions is the use of energy efficient transformers, which can reduce the amount of power needed to accommodate the losses, i.e., energy consumption, and thereby reduce the need to operate the generators that dump heat and carbon dioxide in to the atmosphere.

It is obvious from the discussions that a transformer with low losses has longer life and is cost effective as well. However, it has been a challenge for the transformer manufacturers to develop an efficient manufacturing technique,

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# An Intelligent Approach Based on Metaheuristic for Generator Maintenance Scheduling

S. Tamil Selvi<sup>\*</sup>, S. Baskar<sup>†</sup> and S. Rajasekar<sup>‡</sup>

<sup>\*</sup>SSN College of Engineering, Chennai, India, <sup>†</sup>Thiagarajar College of Engineering, Madurai, India, <sup>‡</sup>NEC Laboratories Singapore, NEC Asia Pacific Pte. Ltd, Singapore, Singapore

## 1 INTRODUCTION

### 1.1 Significance of Generator Maintenance Scheduling

The most important function of an electric power system is to provide electric power to its customers at the lowest possible cost with acceptable reliability levels. The prediction of cost of generation is one important aspect of system planning. Reliability analysis is a fundamental tool in the planning of an electric system. These two aspects, economics and reliability often conflict and render power system managers, planners, designers and operators face with a wide range of challenging problems. Power system engineers and managers have been attempting to achieve the highest possible reliability at an affordable cost.

Reliability is assessing the risk of not being able to meet the demand, even at the time of random outages of the units. The ability to deliver the generated energy to the load points is not the only aspect of reliability assessment. In addition, it also assesses sufficient excess capacity of the generation system required to manage random outages of generator units, including for maintenance on the generating facilities, so that random failure of the units is limited. Maintenance of units is essential to reduce the risk of capacity outage and it ensures that the generating units can continue to operate efficiently and reliably in the long run. Proper and regular maintenance improves the availability of units, reduces the risk of energy being unserved, and improves the reliability.

On the other hand, removing generating units from service for maintenance will reduce the available capacity and may increase the system's risk of not being able to meet increasing demand. Well planned maintenance schedule can improve the system reliability, whereas badly planned maintenance schedules would be directly reflected in the risk of energy unserved (Energy Not

Supplied—ENS). The operation and planning of power system, including economic dispatch, unit commitment, load dispatch, generation co-ordination, generation expansion planning, and such other planning activities are also highly influenced and directly affected by generator maintenance schedule problem decisions [1].

The maintenance schedule, when not optimized, reduces system reliability and increases the costs of the electric power system [2]. It is important for a power generating utility to decide when generators should go off-line for maintenance [3]. Optimal maintenance scheduling is essential because many short-term, middle-term, and long-term power system costs are directly affected by such maintenance scheduling decisions [1], including unit commitment, fuel scheduling, optimal use of water resources, power system development planning, reliability calculations, generation co-ordination, generation expansion planning, export/import of power and such other planning activities.

Preventive optimal generator maintenance scheduling (GMS) is a challenging task. In this chapter, we discuss creating an optimal outage schedule for any number of generating units of plant, which can result in substantial savings in production cost and reduction in ENS.

## 1.2 Preventive GMS Approaches

To avoid premature aging and generator failure, which leads to unplanned and costly power outages, it is important to carry out preventive maintenance at regular intervals [4]. The nature of GMS is nonlinear (derived from nonlinear reliability (ENS) and cost link), stochastic (due to demand uncertainty, and forced outage rate (FOR) of the generators), and constrained problem. The job of this GMS is to determine the period for which the units should be taken offline for planned maintenance over the period of stipulated time horizon (one/two years), so the costs involved are minimized, and system constraints are satisfied. It is for this reason that the GMS problem is treated as an optimization problem. The maintenance schedule of each generator must be optimized based on the objective function under a set of constraints. The most typical objectives found in literature are based on either economic criteria, or reliability criteria. GMS constraints are based on the maintenance technology of the generators (describes appropriate duration, sequence, and continuous length of maintenance), availability of man power, predicted load demand, generator type (coal or hydro), material resources, reliability, etc.

### 1.2.1 Objective Functions

For years, researchers have been searching for an optimal maintenance schedule, which is technically feasible as well as economical. To achieve the solution of this complex task, there are several objective functions which can be



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# Impact Analysis of Intelligent Agents in Automatic Fault-Prone Components Prediction and Testing: Impact Analysis of Intelligent Agents in Test Automation

Jeya Mala Dharmalingam

Source Title: Research Anthology on Agile Software, Software Development, and Testing (/book/research-anthology-agile-software-software/285576)

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Pages: 31

DOI: 10.4018/978-1-6684-3702-5.ch038

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## Abstract

Software quality is imperative for industrial strength software. This quality will be often determined by a few components present in the software which decides the entire functionality. If any of these components are not rigorously tested, the quality will be highly affected. Without knowing which of these components are really critical, it will not be possible to perform high level testing. Hence, to predict such fault-prone or critical components from the software prior to testing and prioritizing them during the testing process, an agent-based approach is proposed in this chapter. The framework developed as part of this work will certainly reduce the field failures and thus will improve the software quality. Further, this approach has also utilized important metrics to predict such components and also prioritized the components based on their critical value. Also, the work proposed in this research has also been compared with some of the existing approaches and the results reveal that, this work is a novel one and can both predict and test the components from the software.

## Chapter Preview

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## Introduction

As per the study of National Institute of Standards and Technology, the cost for an inadequate infrastructure for software testing is estimated to be from \$22.2 to \$59.5 billion (Tassey, 2002). As exhaustive testing (testing 100%) is not feasible (David C., Jinlin Yang, Sarfraz Khurshid, Wei Le and Kevin Sullivan, 2005; Myers, 1979), the industries are forced to stop the testing process at one point of time and deliver the software to the customers. This leads them to compromise the quality of the software due to customers' need for quick delivery of quality software, reduced software development lifecycle, changing markets with global competition and rapid development of new processes and technologies.

The surveys have indicated that, many of the complex systems' failures are due to insufficient testing of software before they are deployed to the customer side (Bernardi, 2011; Schneidewind, 1978). After the analysis, it has been identified that, the highly critical components are not being properly tested or simply ignored without knowing their critical level due to time and cost compromises.

The identification of such critical components from the software prior to testing is still a research area, since the automated testing tools available in the market doesn't address the said problem. Based on our field surveys conducted in several organizations during the past months, it has been identified that, most of the defects reported by the customers after delivery are present in these higher critical components. This gives us the insight on the importance of critical components identification and their verification prior to the delivery of the software. But, the identification of the criticality level of a component involves the evaluation of various metrics and measures associated with them.

Hence, an automated software testing framework that can identify and prioritize the critical components based on the various metrics and measures associated with each of the components and can also provide an optimized critical paths list which can reduce the time and cost needed in the testing process without compromising the testing of these critical components is the need of the hour.

From the literature survey, it has been identified that only a very few works have been conducted in the said research area, and that too have been limited by the type and number of metrics used by them. If the software under test is small and simple then the identification can be done manually. As the real time complex systems have huge functionalities, there is a need for an approach that embeds both intelligence and automation as a tool.

Since software testing is NP-hard (Non-Polynomial hard) (Nagappan, 2006), and as manual testing is costly and error prone, several existing research works on structural testing have employed computationally intelligent techniques, such as artificial intelligence and evolutionary computation methods, to achieve optimization in the testing process (Alok Singh, 2009; Basturk & Karaboga, 2006; Baykasolu A, Lale Özbakır & Pınar Tapkan, 2009; Dorigo M.,

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<i>Danilo F. S. Santos, Embedded Lab, Federal University of Campina Grande, Brazil</i>	
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<i>Walter O. Guerra Filho, Embedded Lab, Federal University of Campina Grande, Brazil</i>	
<i>Marcos Fábio Pereira, Embedded Lab, Federal University of Campina Grande, Brazil</i>	

## Chapter 38

# Impact Analysis of Intelligent Agents in Automatic Fault-Prone Components Prediction and Testing: Impact Analysis of Intelligent Agents in Test Automation

**Jeya Mala Dharmalingam**

 <https://orcid.org/0000-0002-2100-8218>

*Thiagarajar College of Engineering, India*

### **ABSTRACT**

*Software quality is imperative for industrial strength software. This quality will be often determined by a few components present in the software which decides the entire functionality. If any of these components are not rigorously tested, the quality will be highly affected. Without knowing which of these components are really critical, it will not be possible to perform high level testing. Hence, to predict such fault-prone or critical components from the software prior to testing and prioritizing them during the testing process, an agent-based approach is proposed in this chapter. The framework developed as part of this work will certainly reduce the field failures and thus will improve the software quality. Further, this approach has also utilized important metrics to predict such components and also prioritized the components based on their critical value. Also, the work proposed in this research has also been compared with some of the existing approaches and the results reveal that, this work is a novel one and can both predict and test the components from the software.*

DOI: 10.4018/978-1-6684-3702-5.ch038

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## International Conference on Intelligent Data Communication Technologies and Internet of Things

ICICI 2018: **International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018** pp 1548–1556

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# Evaluating Resource Saturation Attack During Controller-Switch Communication in SDN

[S. Sujitha](#) , [M. S. K. Manikandan](#) & [R. Guru Roja](#)

Conference paper | [First Online: 21 December 2018](#)

**1753** Accesses

Part of the [Lecture Notes on Data Engineering and Communications Technologies](#) book series (LNDECT, volume 26)

## Abstract

Software-Defined Networking (SDN) is a developing network paradigm that isolates the system's control (Control plane) from the fundamental switches (Data Plane) and routers and acquainting the capacity of a program to organize operations. The control plane is

7. OpenFlow.org. OpenFlow Switching Reference System. <http://www.openflow.org/wp/downloads/>

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## Author information

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### Authors and Affiliations

**Department of Information Technology,  
Thiagarajar College of Engineering, Madurai, India**

S. Sujitha & R. Guru Roja

**Department of Electronics and Communication  
Engineering, Thiagarajar College of Engineering,  
Madurai, India**

M. S. K. Manikandan



## Cite this paper

Sujitha, S., Manikandan, M.S.K., Guru Roja, R. (2019).  
 Evaluating Resource Saturation Attack During Controller-Switch Communication in SDN. In: Hemanth, J., Fernando, X., Lafata, P., Baig, Z. (eds) International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018. ICICI 2018. Lecture Notes on Data Engineering and Communications Technologies, vol 26. Springer, Cham. [https://doi.org/10.1007/978-3-030-03146-6\\_181](https://doi.org/10.1007/978-3-030-03146-6_181)

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DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-3-030-03146-6_181">https://doi.org/10.1007/978-3-030-03146-6_181</a>	21 December 2018	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-030-03145-9	978-3-030-03146-6	<a href="#">Intelligent Technologies and Robotics</a> <a href="#">Intelligent Technologies and Robotics (R0)</a>

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# தமிழ்ரின் உருவ வழிபாடு

எஸ்.ஏ.வி. இளஞ்செழியன்



தமிழரின் உருவ வழிபாட்டு மரபினுள் புதைந்து கிடக்கும் அரிய வரலாற்று உண்மைகளைப் பிரித்தறியத் தவறியுள்ளோம். அருப வழிபாட்டுடன் தொடக்கம் பெற்ற தமிழரின் ஆன்மீகம், உருவ வழிபாட்டினை எவ்வாறு திணிப்பின்றித் தகவமைத்துக்கொண்டது என்பதைச் செறிவாகப் பேசுகிறது இந்நூல். 'கந்து-கந்திற்பாவை-பாவை-நெடும்பாவை' எனத் தமிழரின் உருவ வழிபாடு, பரிணாமம் அடைந்ததாகக் கூறும் இந்நூலின் ஆசிரியர், கந்துவை அருபம் என்றும் கந்திற்பாவையை அரு உருவம் என்றும் பாவையை முழு உருவம் என்றும் நெடும்பாவையை விஸ்வரூபச் சிற்பம் என்றும் வகைப்படுத்துகிறார். இவற்றை வலுவானச் சான்றுகளுடன் எளிதாக விளக்கும் இந்த ஆய்வு இன்றைய வாசிப்பிற்கானது.



நூ. 125  
சுலசுலுடு  
பதிப்பகம்  
ISBN 978-81-943956-1-4  
00001  
9 788194 395614  
ஆய்வு நூல்

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# Identification of Profile-Injection Attacks in Recommendation System

[C. Santhiya](#) & [K. Indira](#)

Conference paper | [First Online: 21 December 2018](#)

**1801** Accesses | **1** Citations

Part of the [Lecture Notes on Data Engineering and Communications Technologies](#) book series (LNDECT, volume 26)

## Abstract

The suggestion framework makes utilization of different separating calculations. They're Collaborative, substance and cross breed separating procedures. Cooperative separating procedures are utilized to create modernized expectation roughly the enthusiasm of client to social affair a similar rating data. So it's miles easily assaulted by utilizing

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## Author information

---

Authors and Affiliations

**Department of IT, TCE, Madurai, India**

C. Santhiya & K. Indira

Corresponding author

Correspondence to [K. Indira](#).

## Editor information

---

Editors and Affiliations

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Springer, Cham. [https://doi.org/10.1007/978-3-030-03146-6\\_169](https://doi.org/10.1007/978-3-030-03146-6_169)

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DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-3-030-03146-6_169">https://doi.org/10.1007/978-3-030-03146-6_169</a>	21 December 2018	Springer, Cham

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## **Computational Intelligence: Theories, Applications and Future Directions - Volume I** pp 187–197

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# Evaluation of Security Metrics for System Security Analysis

[K. Narasimha Mallikarjunan](#) , [S. Mercy Shalinie](#), [K. Sundarakantham](#) & [M. Aarthi](#)

Conference paper | [First Online: 01 August 2018](#)

**696** Accesses | **3** Citations

Part of the [Advances in Intelligent Systems and Computing](#) book series (AISC, volume 798)

## Abstract

One of the important phases of the computer system is to evaluate its security level. Increase in technology has brought more sophisticated intrusions with which the network security has become more challenging. Even though practically we cannot build a perfect system which is fully secure, we can ensure the security level of the system by quantitatively evaluating it, so that the



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## Author information

---

### Authors and Affiliations

**Department of CSE, Thiagarajar College of Engineering, Madurai, India**

**K. Narasimha Mallikarjunan, S. Mercy Shalinie, K. Sundarakantham & M. Aarthi**

Corresponding author

Correspondence to [K. Narasimha Mallikarjunan](#).

## Editor information

---

### Editors and Affiliations

**Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, Uttar Pradesh, India**

Nishchal K. Verma

**Department of Aerospace Engineering, Indian Institute of Technology Kanpur, Kanpur, Uttar Pradesh, India**

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DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-981-13-1132-1_15">https://doi.org/10.1007/978-981-13-1132-1_15</a>	01 August 2018	Springer, Singapore

Print ISBN	Online ISBN	eBook Packages
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## Computational Intelligence: Theories, Applications and Future Directions - Volume I pp 261–273

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# DDAM: Detecting DDoS Attacks Using Machine Learning Approach

[K. Narasimha Mallikarjunan](#) , [A. Bhuvaneshwaran](#), [K. Sundarakantham](#) & [S. Mercy Shalinie](#)

Conference paper | [First Online: 01 August 2018](#)

751 Accesses | 7 Citations

Part of the [Advances in Intelligent Systems and Computing](#) book series (AISC, volume 798)

## Abstract

Dealing the Distributed Denial of Service (DDoS) attack is a continuing challenge in the field of network security. An Intrusion Detection System (IDS) is one of the solutions to detect the DDoS attack. The IDS system should always be updated with the attack disincentive to preserve the network security service. In this paper, we propose a new approach for anomaly detection using machine

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## Author information

---

### Authors and Affiliations

**Department of CSE, Thiagarajar College of Engineering, Madurai, India**

**K. Narasimha Mallikarjunan, A. Bhuvaneshwaran, K. Sundarakantham & S. Mercy Shalinie**

### Corresponding author

Correspondence to [K. Narasimha Mallikarjunan](#).

## Editor information

---

### Editors and Affiliations

**Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur, Uttar Pradesh, India**

Nishchal K. Verma

**Department of Aerospace Engineering, Indian Institute of Technology Kanpur, Kanpur, Uttar Pradesh, India**

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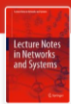
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Narasimha Mallikarjunan, K., Bhuvaneshwaran, A., Sundarakantham, K., Mercy Shalinie, S. (2019). DDAM: Detecting DDoS Attacks Using Machine Learning Approach. In: Verma, N., Ghosh, A. (eds) Computational Intelligence: Theories, Applications and Future Directions - Volume I. Advances in Intelligent Systems and Computing, vol 798. Springer, Singapore. [https://doi.org/10.1007/978-981-13-1132-1\\_21](https://doi.org/10.1007/978-981-13-1132-1_21)

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DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-981-13-1132-1_21">https://doi.org/10.1007/978-981-13-1132-1_21</a>	01 August 2018	Springer, Singapore

Print ISBN	Online ISBN	eBook Packages
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## Performance Analysis of Image Denoising with Curvelet Transform in Detecting the Stego Noise

J. Hemalatha  M. K. Kavitha Devi & S. Geetha

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# Evaluating Resource Saturation Attack During Controller-Switch Communication in SDN

[S. Sujitha](#) , [M. S. K. Manikandan](#) & [R. Guru Roja](#)

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<http://openflow.org/documents/openflow-spec-v1.1.0.pdf>

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## Author information

---

### Authors and Affiliations

**Department of Information Technology,  
Thiagarajar College of Engineering, Madurai, India**

**S. Sujitha & R. Guru Roja**

**Department of Electronics and Communication  
Engineering, Thiagarajar College of Engineering,  
Madurai, India**

**M. S. K. Manikandan**

## Cite this paper

Sujitha, S., Manikandan, M.S.K., Guru Roja, R. (2019).  
 Evaluating Resource Saturation Attack During Controller-Switch Communication in SDN. In: Hemanth, J., Fernando, X., Lafata, P., Baig, Z. (eds) International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018. ICICI 2018. Lecture Notes on Data Engineering and Communications Technologies, vol 26. Springer, Cham. [https://doi.org/10.1007/978-3-030-03146-6\\_181](https://doi.org/10.1007/978-3-030-03146-6_181)

[.RIS](#) ↓ [.ENW](#) ↓ [.BIB](#) ↓

DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-3-030-03146-6_181">https://doi.org/10.1007/978-3-030-03146-6_181</a>	21 December 2018	Springer, Cham

Print ISBN	Online ISBN	eBook Packages
978-3-030-03145-9	978-3-030-03146-6	<a href="#">Intelligent Technologies and Robotics</a> <a href="#">Intelligent Technologies and Robotics (R0)</a>

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# Accurate Classification of Cancer in Mammogram Images



M. Parisa Beham, R. Tamilselvi, S. M. Mansoor Roomi and A. Nagaraj

**Abstract** In the last decade, machine learning plays a vital role in the detection of breast cancer. Mammography is a proficient tool for early stage detection of breast cancer. In this work, a simple technique for breast cancer image classification in 1 mammogram images is proposed. Highly discriminant local binary patterns are extracted from the wavelet normalized mammogram images. K-nearest neighbor classifier is used to categorize the abnormal cancer cell images. A mammogram database is created to evaluate the efficacy of our algorithm. From the experimental results, the performance of our algorithms is comparatively good with very less computational time.

**Keywords** Mammogram database · Cancer cell detection · Benign and malignant · LBP · K-NN classifier

## 1 Introduction

In biomedical engineering, the concepts are related to biotechnology that is used for various healthcare purposes. It solves problem in engineering field that is related to biotechnology and it is used for advanced treatment. Biomedical field focuses on human health and healthcare at various levels. It includes the development of various diagnosis and therapy medical devices that range from clinical equipment to micro-

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M. Parisa Beham (✉) · R. Tamilselvi · A. Nagaraj  
Department of ECE, Sethu Institute of Technology, Virudhunagar, Tamil Nadu, India  
e-mail: [parisaphd2011@gmail.com](mailto:parisaphd2011@gmail.com)

R. Tamilselvi  
e-mail: [rts.ece@gmail.com](mailto:rts.ece@gmail.com)

A. Nagaraj  
e-mail: [nagaraj.sa@gmail.com](mailto:nagaraj.sa@gmail.com)

S. M. Mansoor Roomi  
Department of ECE, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India  
e-mail: [smmroomi@tce.edu](mailto:smmroomi@tce.edu)

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H. S. Saini et al. (eds.), *Innovations in Electronics and Communication Engineering*, Lecture Notes in Networks and Systems 65,  
[https://doi.org/10.1007/978-981-13-3765-9\\_8](https://doi.org/10.1007/978-981-13-3765-9_8)

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# Estimation of Face Pose Orientation Using Model-Based Approach



M. Annalakshmi, S. M. Mansoor Roomi and M. Parisa Beham

**Abstract** In the domain of computer vision and pattern recognition, though there are numerous methods for face recognition, it is still remaining as a very challenging problem in real life applications. Face detection and recognition suffer from many problems which are caused by the variations in orientation, size, illumination, expression, and poses. This paper mainly revolves around face detection and oriented pose identification. The state-of-the-art Constrained Local Model (CLM) is applied to detect the face from any wild facial image. The extracted feature points are used to segregate the dominant parts of faces. From the dominant feature points, nose tip and eye points have been identified. Applying the geometrical parameters between the nose tip and eye points, the pose orientation of the wild face has been identified. This method is very simple and accurate. The performance evaluation has been done on unconstrained Essex database and internal wild database collected from internet.

**Keywords** CLM model · CLM search · Segregation · Pose estimation · Geometrical parameters

## 1 Introduction

The most significant human sense is vision. Henceforth, the fact that images play vital role in human perception is not surprising. Computer vision is the science that develops algorithmic basis by which useful information can be automatically

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M. Annalakshmi · M. Parisa Beham (✉)

Department of ECE, Sethu Institute of Technology, Virudhunagar, Tamil Nadu, India  
e-mail: [parisaphd2011@gmail.com](mailto:parisaphd2011@gmail.com)

M. Annalakshmi

e-mail: [annam.baluss@gmail.com](mailto:annam.baluss@gmail.com)

S. M. Mansoor Roomi

Department of ECE, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India  
e-mail: [smmroomi@tce.edu](mailto:smmroomi@tce.edu)

© Springer Nature Singapore Pte Ltd. 2019

H. S. Saini et al. (eds.), *Innovations in Electronics and Communication Engineering*, Lecture Notes in Networks and Systems 65,  
[https://doi.org/10.1007/978-981-13-3765-9\\_7](https://doi.org/10.1007/978-981-13-3765-9_7)



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# Visual Object Tracking with Deep Neural Networks

*Edited by Pier Luigi Mazzeo,  
Srinivasan Ramakrishnan and Paolo Spagnolo*



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# Deep-Facial Feature-Based Person Reidentification for Authentication in Surveillance Applications

*Yogameena Balasubramanian, Nagavani Chandrasekaran, Sangeetha Asokan and Saravana Sri Subramanian*

## Abstract

Person reidentification (Re-ID) has been a problem recently faced in computer vision. Most of the existing methods focus on body features which are captured in the scene with high-end surveillance system. However, it is unhelpful for authentication. The technology came up empty in surveillance scenario such as in London's subway bomb blast, and Bangalore ATM brutal attack cases, even though the suspected images exist in official databases. Hence, the prime objective of this chapter is to develop an efficient facial feature-based person reidentification framework for controlled scenario to authenticate a person. Initially, faces are detected by faster region-based convolutional neural network (Faster R-CNN). Subsequently, landmark points are obtained using supervised descent method (SDM) algorithm, and the face is recognized, by the joint Bayesian model. Each image is given an ID in the training database. Based on their similarity with the query image, it is ranked with the Re-ID index. The proposed framework overcomes the challenges such as pose variations, low resolution, and partial occlusions (mask and goggles). The experimental results (accuracy) on benchmark dataset demonstrate the effectiveness of the proposed method which is inferred from the observation of receiver operating characteristic (ROC) curve and cumulative matching characteristics (CMC) curve.

**Keywords:** video surveillance, person reidentification, facial feature-based reidentification, Faster R-CNN, SDM

## 1. Introduction

Nowadays, a large network of cameras is predominantly used in public places like airports, railway stations, bus stands, and office buildings. These networks of cameras provide enormous video data, which are monitored manually and may be utilized only when the need arises to ascertain the fact. Fascinatingly, an automated analysis of such huge video data can improve the quality of surveillance by processing the video faster. Above all, it is more useful for high-level surveillance tasks like suspicious activity detection or undesirable event prediction for timely

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**Department of CSE, Thiagarajar College of Engineering, Madurai, India**

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<sup>a</sup> Department of Electronics and Communication Engineering, VV College of Engineering, Tisaiyanvilai, India

<sup>b</sup> **Department of Electronics and Communication Engineering, Thiagarajar College of Engineering, Madurai, India**

<sup>c</sup> Department of Electronics and Communication Engineering, University College of Engineering, Dindigul, India

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<sup>a</sup> **Department of Electronics and Communication Engineering, Velammal College of Engineering and Technology, Thiagarajar College of Engineering, Madurai, Tamilnadu, India**

<sup>b</sup> **Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, Tamilnadu, India**

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<sup>a</sup> ECE Department, Sethu Institute of Technology, Madurai, Tamilnadu, India

<sup>b</sup> ECE Department, Thiagarajar College of Engineering, Madurai, Tamilnadu, India

<sup>c</sup> ECE Department, Vickram College of Engineering, Madurai, Tamilnadu, India

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<sup>a</sup> Department of Mechatronics Engineering, Thiagarajar College of Engineering, Madurai, India

<sup>b</sup> Department of Electrical and Electronic Engineering, Manipal Institute of Technology, Manipal, India

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**Correspondence Address**

Sri R.L.; Department of Computer Science and Engineering, India; email: rlsit@tce.edu

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<sup>a</sup> Walchand Institute of Technology, Solapur, India

<sup>b</sup> Ferpze Gandhi Institute of Professional Studies, Raebareli, India

<sup>c</sup> IPS Academy, Indore, India

<sup>d</sup> Thiagarajar College of Engineering, Madurai, India

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<sup>a</sup> Monash University, School of Engineering, Department of Mechatronics, Malaysia

<sup>b</sup> **Thiagarajar College of Engineering, Department of Computer Science and Engineering, Madurai, India**

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<sup>a</sup> **Thiagarajar College of Engineering, Department of Information Technology, Madurai, India**

<sup>b</sup> **Thiagarajar College of Engineering, Department of Computer Applications, Madurai, India**

<sup>c</sup> Monash University, Department of Mechanical Engineering, Malaysia

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**2-s2.0-85080085398**  
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<sup>a</sup> **Thiagarajar College of Engineering, Department of Information Technology, Madurai, India**

<sup>b</sup> **Thiagarajar College of Engineering, Department of Computer Science and Engineering, Madurai, India**

<sup>c</sup> G.K.M. College of Engineering and Technology, Department of Information Technology, Chennai, India

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**ISBN:** 9781728103525

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<sup>a</sup> Department of Information Technology, Thiagarajar College of Engineering, Madurai, India

<sup>b</sup> Department of Computer Technology, Madras Institute of Technology, Anna University, Chennai, India

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**Publisher:** Institute of Electrical and Electronics Engineers Inc.

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<sup>a</sup> Department of Electrical and Electronics Engineering, Thiagarajar College of Engineering, Madurai, Tamilnadu, India

<sup>b</sup> Department of Electrical and Electronics Engineering, Kamaraj College of Engineering and Technology, Virudhunagar, Tamilnadu, India

<sup>c</sup> Centre for Electric Energy and Automation, Multimedia University, Cyberjaya, Selangor, Malaysia

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- <sup>a</sup> Dept of Information Technology, Thiagarajar College of Engineering, Madurai, India  
<sup>b</sup> Dept of Computer Science Engineering, G.K.M College of Engineering, Chennai, India  
<sup>c</sup> Department of Medicine, Theni Government Medical College and Hospital, Theni, India

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Dept. of Computer Science and Engineering, Thiagarajar College of Engineering, Madurai, Tamilnadu, India

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Thiagarajar College of Engineering, CSE Department, Madurai, Tamil Nadu, India

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Department of CSE, TCE, Madurai, Tamil Nadu, India

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**Thiagarajar College of Engineering, Department of Computer Science and Engineering, Madurai, India**

**Publisher:** Institute of Electrical and Electronics Engineers Inc.

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**Department of ECE, Thiagarajar College of Engg, Madurai, TN, India**

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<sup>a</sup> **Department of ECE, Thiagarajar College of Engineering, Madurai, India**

<sup>b</sup> **Department of ECE, Kamaraj College of Engineering and Technology, Virudhunagar, India**

**Publisher:** Institute of Electrical and Electronics Engineers Inc.

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**ECE Department, Thiagarajar College of Engineering, Madurai, Tamilnadu, India**

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<sup>b</sup> Artha.zone LLC, United States of America, India

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**ISBN:** 9781538644300

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**ISBN:** 9781538644300

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<sup>b</sup> **Department of Electronic and Communication Engineering, Thiagarajar College of Engineering, Madurai, India**

**Publisher:** Institute of Electrical and Electronics Engineers Inc.

**ISBN:** 9781538638026

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Akshaya Preethi A.; Electrical and Electronics Engineering Department, India; email: akshayapreethi95@gmail.com

**Publisher:** Institute of Electrical and Electronics Engineers Inc.

**ISBN:** 9781538638026  
**2-s2.0-85055813792**  
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**Publisher:** Institute of Electrical and Electronics Engineers Inc.

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<sup>b</sup> **Department of Electronic Communication Engineering, Thiagarajar College of Engineering, Madurai, India**

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<sup>b</sup> Indian Institute of Technology, Department of Electrical Engineering, Madras Chennai, India

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<sup>b</sup> Department of Computer Technology, Madras Institute of Technology, Anna University, Chennai, India

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<sup>a</sup> Electronics and Instrumentation Engineering, SRM Institute of Science Technology, Kattankulathur, Tamil Nadu, India

<sup>b</sup> Electrical and Electronics Engineering Thiagarajar College of Engineering, Madurai, Tamil Nadu, India

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<sup>a</sup> CSE Department, NITK Surathkal, Karnataka, India

<sup>b</sup> Electronic Solutions, Honeywell Technology Solutions, Hyderabad, India

<sup>c</sup> CSE Department, Thiagarajar College of Engineering, Madurai, India

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<sup>b</sup> Department of ECE, Thiagarajar College of Engineering, Madurai, Tamil Nadu, India

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<sup>a</sup> Department of Electrical and Electronics Engineering, Manipal Institute of Technology, Manipal University, Manipal, 576104, India

<sup>b</sup> Department of Mechatronics Engineering, Thiagarajar College of Engineering, Madurai, sa625015, India

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<sup>a</sup> Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, India

<sup>b</sup> Department of Physics, Thiagarajar College of Engineering, Madurai, India

**Correspondence Address**

Rajeshshyam R.; Department of Mechanical Engineering, India; email: rajeshshyam94@gmail.com

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**Correspondence Address**

Arirajan K.A.; Department of Mechanical Engineering, India; email: arirajan7@gmail.com

**Publisher:** American Institute of Physics Inc.



**ISSN:** 0094243X

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<sup>a</sup> **Mechanical Engineering, Thiagarajar College of Engineering, Madurai, Tamil Nadu, 625015, India**

<sup>b</sup> **Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, Tamil Nadu, 625015, India**

**Correspondence Address**

Balasubramani V.; Mechanical Engineering, India; email: vbmech@tce.edu

**Publisher:** Institute of Physics Publishing

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<sup>b</sup> **Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai Tamilnadu, 625015, India**

**Correspondence Address**

Rajan B.M.C.; Department of Mechanical Engineering, India; email: muthutce08@gmail.com

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<sup>a</sup> Thiagarajar College of Engineering, Madurai, India

<sup>b</sup> Theoretical Computer Science Lab, Department of Computer Science and Engineering, Indian Institute of Technology Madras, Chennai, India

**Correspondence Address**

Paul A.; Theoretical Computer Science Lab, India; email: arinjita@cse.iitm.ac.in

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<sup>b</sup> Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, Tamil Nadu, 625015, India

**Correspondence Address**

Balasubramani V.; Mechanical Engineering, India; email: vbmech@tce.edu

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**Correspondence Address**

Kumar C.S.; Department of Mechanical Engineering, India; email: cskmech@tce.edu

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<sup>a</sup> [Thiagarajar College of Engineering, Madurai, Tamil Nadu, India](#)

<sup>b</sup> Zoho Corporation, Chennai, India

<sup>c</sup> Amazon, Chennai, India

**Correspondence Address**

Jeya Mala D.; Thiagarajar College of Engineering India; email: djeyamala@gmail.com

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<sup>b</sup> Department of Computer Technology, Anna University, MIT Campus, Chennai, Tamilnadu 600044, India

**Correspondence Address**

Thangavel M.; Department of Information Technology, India; email: thangavelmuruganme@gmail.com

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<sup>a</sup> Department of Civil Engineering, Arulmigu Palaniandavar Polytechnic College, Palani, India

<sup>b</sup> [Department of Civil Engineering, Thiagarajar College of Engineering, Madurai, India](#)

<sup>c</sup> Institute of Thermal Power Engineering, Faculty of Mechanical Engineering, Cracow University of Technology, Krakow, Poland

<sup>d</sup> Institute of Heat Transfer Engineering and Air Protection, Cracow University of Technology, Krakow, Poland

<sup>e</sup> Department of Mechanical Engineering, Velammal College of Engineering and Technology Madurai, Madurai, India

**Correspondence Address**

Rajesh Kanna P.; Department of Mechanical Engineering, India; email: prkanna@gmail.com

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**Correspondence Address**

Padmavathi S.; Thiagarajar College of Engineering (A Govt. Aided Autonomous Institution)India; email: spmcse@tce.edu

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Suraj R.; Thiagarajar College of EngineeringIndia; email: suraj@tce.edu

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<sup>a</sup> Department of IT, Thiagarajar College of Engineering, Madurai, India

<sup>b</sup> Department of CSE, Thiagarajar College of Engineering, Madurai, India

**Correspondence Address**

Manju T.; Department of IT, India; email: tmanju@tce.edu

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**Correspondence Address**

Ravi N.; Department of Computer Science and Engineering, India; email: rathnaravi2013@gmail.com

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<sup>a</sup> Dept. of Electrical and Electronic Engineering, Thiagarajar College of Engineering, Madurai, 625015, India

<sup>b</sup> Dept. of Chemistry, Thiagarajar College of Engineering, Madurai, 625015, India

**Correspondence Address**

Sivasankar G.; Dept. of Electrical and Electronic Engineering, India; email: g.sivasankar@live.in

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<sup>a</sup> ZF Electronics TVS India Private Ltd., Madurai, India

<sup>b</sup> Kalasalingam University, Krishnankoil, India

<sup>c</sup> R & D Center, Bharathiar University, Coimbatore, India

<sup>d</sup> Thiagarajar College of Engineering, Madurai, India

<sup>e</sup> Mepco Schlenk Engineering College, Sivakasi, India

**Correspondence Address**

Sabitha M.S.; R & D Center, India; email: muralisabi@gmail.com

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<sup>b</sup> ZF Electronics TVS, Madurai, India

<sup>c</sup> Thiagarajar College of Engineering, Madurai, India

<sup>d</sup> Kalasalingam University, Krishnankoil, India

<sup>e</sup> Mepco Schlenk Engineering College, Sivakasi, India

**Correspondence Address**

Subramanian S.M.; Bharathiar University & ZF Electronics TVS(for Sabitha)India; email: muralisabi@gmail.com

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**ISBN:** 9783319606170

2-s2.0-85028597387

**Publication Stage:** Final

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<sup>a</sup> Department of Mechanical Engineering, Jeppiaar Institute of Technology, Sunguvarchatram, Kunnam, Sriperumbudur, Chennai, 631604, India

<sup>b</sup> Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, 625 015, India

<sup>c</sup> Department of Mechanical Engineering, University College of Engineering, Ramanathapuram, 623513, India

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<sup>b</sup> Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, 625 015, India

<sup>c</sup> Department of Mechanical Engineering, Jeppiaar Institute of Technology, Sunguvarchatram, Kunnam, Sriperumbudur, Chennai, 631 604, India

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<sup>a</sup> Thiagarajar College of Engineering, Dept. of Computer Science Engineering, Madurai, India

<sup>b</sup> Thiagarajar College of Engineering, Dept. of Information Technology, Madurai, India

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TCE, Department of ECE, Madurai, India

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<sup>a</sup> Department of Computer Science and Engineering, Thiagarajar College of Engineering, Madurai, India

<sup>b</sup> Department of Computer Science, Tennessee Tech University, United States

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Department of EEE, Thiagarajar College of Engineering, A Govt. Aided Institution, Anna University Chennai, Madurai, India

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**Department of Computer Science and Engineering, Thiagarajar college of Engineering, Madurai, India**

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**Department of CSE, Thiagarajar College of Engineering, Madurai, India**

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2-s2.0-85074085258

**Publication Stage:** Final

24) Halimaa, A.A., Sundarakantham, K.