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A Novel Islanding Detection Technique for Grid-Connected Distributed Generation Using KNN and SVM

Advances in Clean Energy Technologies pp 819-831 | Cite as

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Abstract

This paper presents a novel technique for islanding detection using machine learning. Islanding occurs when a distribution generation (DG) along with local load become electrically isolated from the grid. Existing methodologies lack in accuracy and speed of islanding detection. The proposed methodology involves the simulation of distribution system with DG, creation of islanding, and non-islanding cases to capture voltages and current data which will be further processed using a four-level discrete wavelet transform for feature extraction. The machine learning classification model is created using a supervised learning classification algorithm based on the dataset generated. This classification model is used to detect the islanding condition. The proposed system is tested on different islanding and non-Islanding conditions. The experimental result shows that the proposed methodology is efficient than earlier islanding detection techniques.

Keywords

Islanding Machine learning Classifier Distributed generation Support vector machine K-nearest neighbor

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Design and Control of Capacitor-Supported Dynamic Voltage Restorer for Mitigation of Power Quality Disturbances

Mohan Tasre, Gajanan Dhole, Saurabh Jadhao, and Rajesh Sharma

Abstract Voltage sag contributes majorly in the stalling industrial processes which further incur the economic loss. The dynamic voltage restorer has emerged as an efficient technology for sag mitigation. The capacitor-supported dynamic voltage restorer is the cost-effective solution that mitigates sag problem. This work describes the capacitor-supported DVR architecture along with analysis of its compensation technique mathematically. Further, the simplified methodology adopted for specification determination of major components is explained. The time-domain control algorithm with required transformations is explained. The adopted design and control strategy of is justified by observing DVR performance with ideal and practical power system conditions.

Keywords Point of common coupling · Voltage sag · Total harmonic distortion · Voltage unbalance factor

1 Introduction

Engineering researches have modernized the generation, transmission as well as distribution sectors of power system. At distribution level, the distribution feeder is under shear stress due to varied load connected on them. Similarly, at consumer end, electrical load employed for industrial, commercial, and domestic sectors undergone

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Improved Control Strategy for Harmonic Mitigation in Multilevel Inverter

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Abstract- **In multilevel inverters, obtaining solution to the selective harmonic elimination equation is really difficult and time consuming. Secondly, finding global optimum solution is also challenging. In this paper, new improved proposed optimization algorithm is presented. As Compared to other optimization algorithms, it will enhance the computational speed and chances for finding global solution will be more. Also it will escape the solution from stucking into local optima. This proposed algorithm mainly targets at adaptive adjustment control of pheromone and updation of active evaporation factor. In this, pheromone deposition factor and ant's movement is improved and making it convenient for solving large scale problems. Hence this proposed algorithm is applied for solving nonlinear transcendental equation which not only provides the optimized solution for switching angles but it will reduce the lower order harmonics and THD also. The various simulated and experimental results shown in the paper proves the effectiveness of proposed algorithm for finding the global optimum solution with high convergence speed.**

Keywords- Adaptive control pheromone; Ant colony optimization; Active evaporation factor; Selective harmonic elimination; Multilevel Inverter; Total harmonic distortion.

I. INTRODUCTION

The ACO algorithm with its several advantages is widely used in solving many combinatorial optimization problems. It has positive feedback for obtaining rapid solution, dynamic applications, metahuristics search characteristics, robustness, Inherent parallelism implementation etc. Hence gradually it becomes the emerging field in solving optimization algorithms [1]-[3]. First it was used in problem of quadratic assignment [4], problem of job scheduling [5], to solve traveling salesman problem [6] and so on. Inspite of many advantages, it has shortcomings too i.e., maximum searching time, very slow speed of convergence, premature convergence for complex problems and so on. Many researchers proposed improved ACO algorithms to overcome these shortages. ACO with active pheromone updation and cell scheduling is proposed by Leng et al. for flexible manufacturing process to reduce cost and time [7]. Yang and Lai proposed improved ACO for p//T (p//T-ACO) for solving practical large scale problems [8]. Xu et al. suggested chaotic map for hybrid algorithm for enhancement of basic the ACO algorithm and to solve VRP problems [9]. Combination of ant colony algorithm with particle swarm algorithm is applied to solve traveling salesman problem (TSP) by Walid et al.[10]. Extended ant colony algorithm to implement regulation policy for controlling each type of ant during search process is presented by Escario et al.[11]. New GACO ant colony algorithm to compute Unified Device Architecture is presented by Li and Jin [12]. This paper presents, improved new ant colony optimization (NEWACO) algorithm which is an efficient and intelligent algorithm applied to solve nonlinear selective harmonic elimination equations which are transcendental in nature to obtain the optimized solution for switching angles in single phase H-Bridge 7 level multilevel inverter. With these solutions, Total Harmonic Distortion (THD) will also reduce to a great extent which proves the effectiveness of proposed algorithm.

II. Formulation of SHE Equations

Fig.1 shows bipolar output voltage waveform in inverters. From Fourier series, the output voltage equation can be obtained and is by equation (1). This equation is a nonlinear transcendental equation which contains trigonometric terms given by

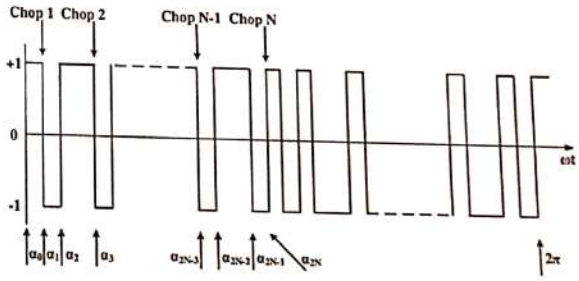

Fig. 1 Bipolar Output voltage waveform

$$V_{2k+1} = \frac{4V_{dc}}{(2k+1)\pi} \sum_{i=0}^{N} \cos(2k+1)\alpha_i \qquad (1)$$

Where, V = Inverter output voltage
V_{dc} = Input voltage magnitude
α = Switching angles
N = Harmonic equations
k = Number of switching angles (from 0 to N-1)

Total number of harmonic equations (N) can be given by

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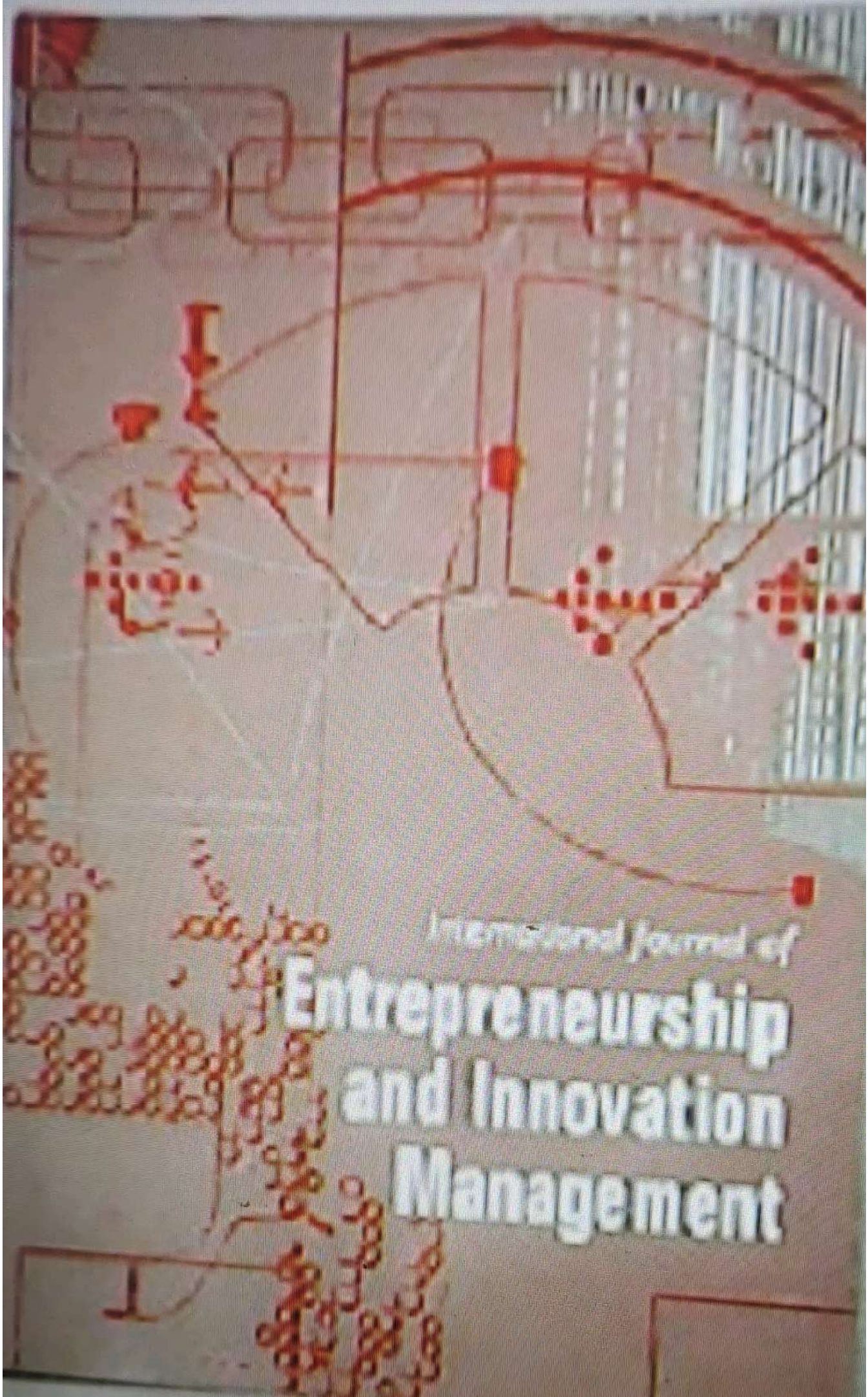
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Delighted niche driven entrepreneurial odyssey: a case study of Maharaja Masala Udyog

H.M. Jha Bidyarthi, Mayur A. Dande, Pawan M. Kuchar, Satya Mohan Mishra and Ashish K. Shrivastava

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Abstract

Santosh Satyanarayanji Didwaniya, the entrepreneur of Maharaja Masala Udyog, Khamgaon led his Udyog from mere 15-16 kilograms of mixed spices sale to a monthly turnover of 25,000 kilograms of Maharaja Mix Garam Masala capturing 75% to 80% of market and claiming an annual growth of 7% to 8%. The unbelievably successful entrepreneurial odyssey of Santoshbhai is embedded with single product sale through zero level distribution channel with a negligible modernisation of processing section and a very little modernisation of packaging and storage, and use of conventional management method. His consumers are so delighted with the unique taste and flavour of the Maharaja Mix Garam Masala that his market territory is fortified even amidst the presence of many multinational companies and some leading local brands. The case comprises rich knowledge and intense thought provocation relating to entrepreneurship and innovation management based on traditional management practices and niche marketing concepts.

Keywords

niche market, entrepreneurship, product positioning, innovations, consumer delight

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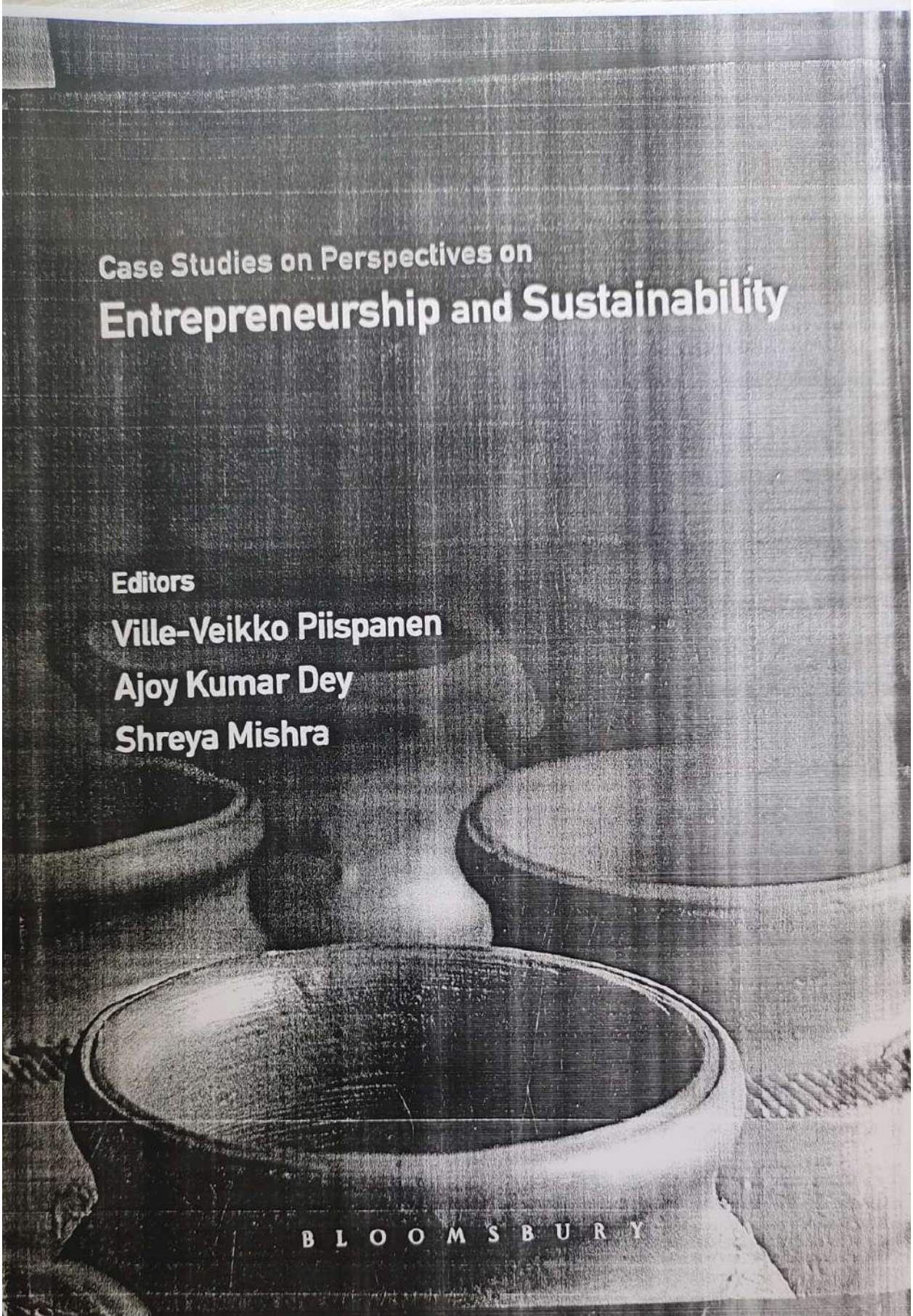

BLOOMSBURY

Corporate Entrepreneurship – A Case Study of Yash Enterprises

H.M. Jha "Bidyarthi"[1], *S.M. Mishra[2]*, *M.A. Dande[3]*, *P.M. Kuchar[4] and A.K. Shrivastava[5]*

ABSTRACT

Bipin Gandhi's father had a business of gunny bags, coal and industrial supplies at Khamgaon. But He was interested in his domain area. So he started a business of supplying laboratory instruments and chemicals to schools, colleges and nearby industries. He established a lot of industry contacts in Khamgaon including executives of the then Hindustan Lever Limited – now Hindustan Unilevers Ltd. – HUL which fetched him some small job works from HUL. Meanwhile, the export demand for Pears soap being manufactured by HUL went up beyond its production level. So HUL outsourced people through Bipin Gandhi to boost the production of Pears soap. Bipin Gandhi saw an opportunity in this scenario being faced with by the HUL and he established Yash Enterprises – a proprietary firm - to augment HUL's production of Pears soap. The firm grew and further expanded through a sister concern – SNG Packaging Pvt. Ltd. Today the firm employs 450 people and has a total investment of Rs. 35 crores.

Dilemma: *The questions that arise are – can a small entrepreneur be born at the instance of a multinational giant? Can the entrepreneur grow rapidly with the support of this MNC leading to a mutual benefit? What role does an MNC play in nurturing an entrepreneur? What qualities did the entrepreneur possess which drove the HUL to lend all support to him in his journey towards success, exponential growth and a long association for over twenty years and continuing? Can a small plant grow under the shadow of a big banyan tree?*

Theory: *Corporate Entrepreneurship and innovation management. The case focuses on characteristics of a successful entrepreneur in general and those significant dimensions, in particular, which bring about entrepreneurial birth and growth in the company of a multinational giant.*

Basis of the case: *Phenomenon base case*

Type of the case: *Applied decisional*

Protagonist: *Present – Shri Bipin Gandhi*

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Disclaimer: This case has been developed for classroom discussion and is not intended to illustrate either effective or ineffective handling of an administrative situation or to represent successful or unsuccessful managerial decision making or endorse the views of the management.

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DEPARTMENT OF INFORMATION TECHNOLOGY

SESSION 2020-2021

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

Sr. No.	Name of the Teacher	Title of the Paper	Title of the Proceedings of the Conference	National / International	Year of Publication	ISBN/ISSN of the Proceeding
1	Prof. A S Manekar	Optimizing Cost And Maximizing Profit For Multi Cloud Based Big Data Computing By Deadline Aware Optimize Resource Allocation	Recent Studies on Computational Intelligence, a part of the Studies in Computational Intelligence Book Series (SCI Volume 921)	International	2020	978-981-15-8469-5
2	Prof. A S Manekar	Metaheuristic Optimization Using Hybrid Algorithm in Cloud-Based Big Data Analytics	Proceedings of the 2nd International Conference on Computational and Bio Engineering CBE 2020 (1st ed. 2021) (Lecture Notes in Networks and Systems #215)	International	2021	978-981-16-1941-0
3	Prof. S D Padiya	Analysis of Data Aggregation Methods to Avoid Data Redundancy in Wireless Sensor Network	Proceedings of the 2020 12th IEEE International Conference on Computational Intelligence and Communication Networks	International	2021	978-1-7281-9393-9

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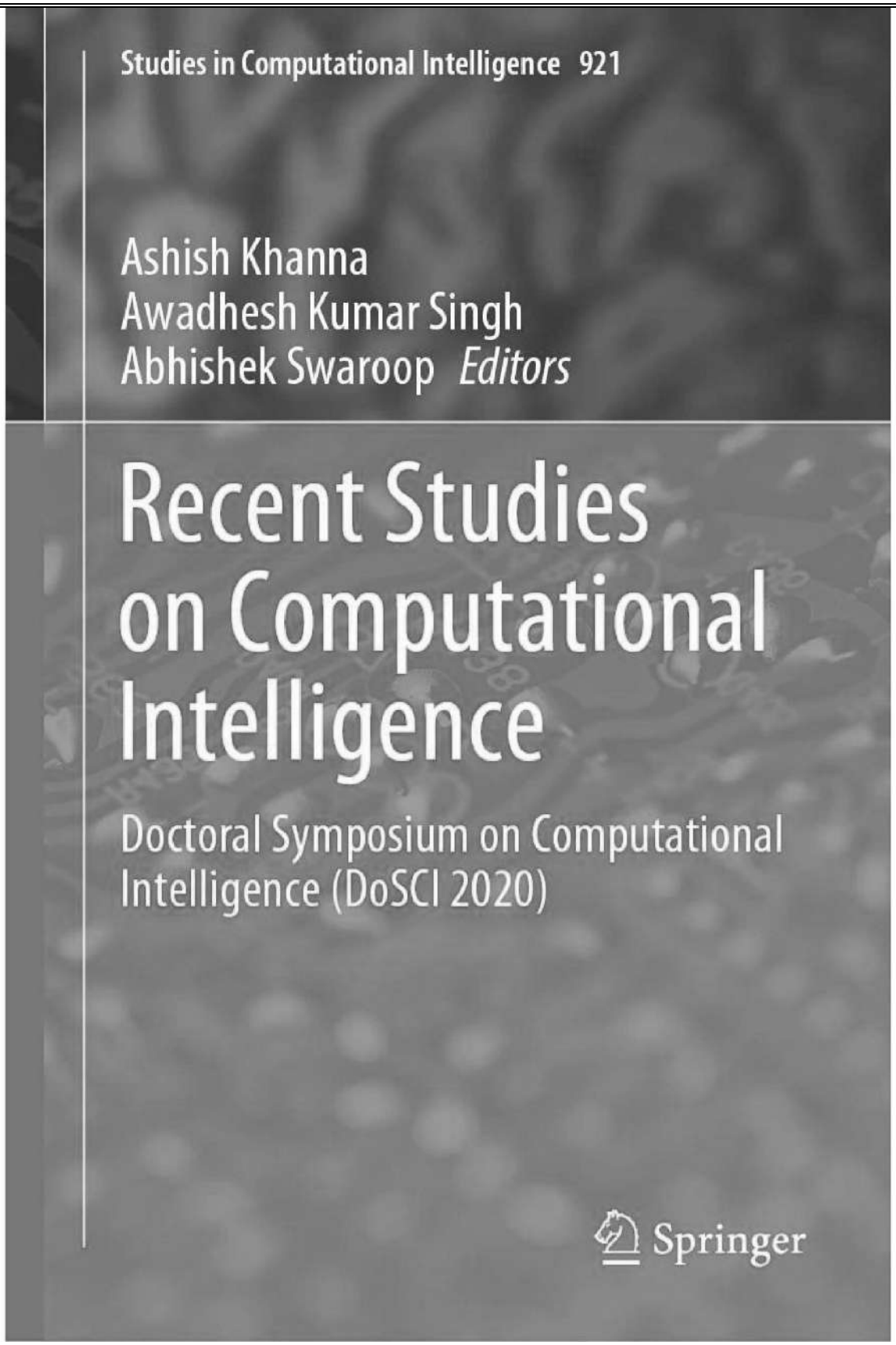

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Optimizing Cost and Maximizing Profit for Multi-Cloud-Based Big Data Computing by Deadline-Aware Optimize Resource Allocation

Amitkumar Manekar and G. Pradeepini

Abstract Cloud computing is most powerful and demanding for businesses in this decade. "Data is future oil" can be proved in many ways, as most of the business and corporate giants are very much worried about business data. In fact to accommodate and process this data, we required a very expensive platform that can work efficiently. Researchers and many professionals have been proved and standardize some cloud computing standards. But still, some modifications and major research toward big data processing in multi-cloud infrastructure need to investigate. Reliance on a single cloud provider is a challenging task with respect to services like latency, QoS and non-affordable monetary cost to application providers. We proposed an effective deadline-aware resource management scheme through novel algorithms, namely job tracking, resource estimation and resource allocation. In this paper, we will discuss two algorithms in detail and do an experiment in a multi-cloud environment. Firstly, we check job track algorithms and at last, we will check job estimation algorithms. Utilization of multiple cloud service providers is a promising solution for an affordable class of services and QoS.

Keywords BDA · Resource allocator · Cloud computing · Optimization · Fare share · Cost optimization

1 Introduction

The last decade was a "data decade." Many multi-national company changes its modes of operation based on data analysis. Big data and data analysis is an essential and mandate for every industry. Companies like Amazon, Google and Microsoft are ready with their data processing platform completely based on the cloud [1] in other

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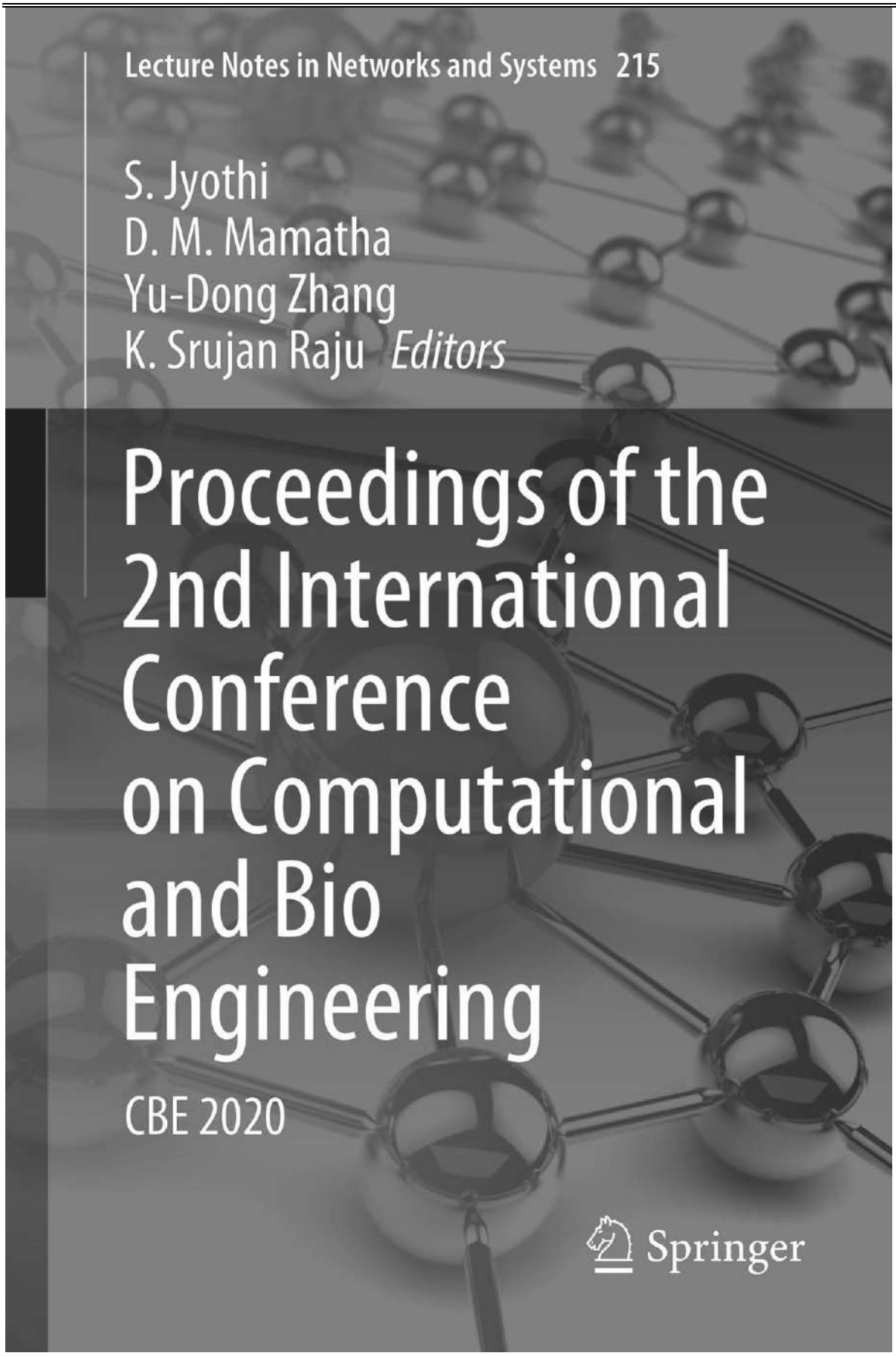

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Metaheuristic Optimization Using Hybrid Algorithm in Cloud-Based Big Data Analytics

Amitkumar Manekar and G. Pradeepini

Abstract Task Scheduling is a prominent research topic in cloud computing. There are several objectives associated with Optimise Task Scheduling and Resource allocation as cloud computing systems are more complex than the traditional distributed system. There are several challenges such as resolving the task mapped to the node on which task to be executed. Modelling deadline or make spam parameter, task reliability, various task allocation strategies, etc. A simplified but near-optimal proposed nature-inspired algorithms are focus in this paper. In this paper, a basic idea about optimisation, reliability, and complexity is considered while designing a modern BDA solution (Big Data Application). In this paper, we focused on Dragonfly algorithm and Sea lion algorithms which are nature-inspired algorithms. These algorithms are efficient for optimisation purposes for solving task scheduling and resource allocation problem. Finally, the performance of the DA algorithm and Sea lion is compared with the Genetic Algorithm (GA) and Particle Swarm Optimisation (PSO) for modern BDA such as Hadoop Map reduce. Simulation results prove the efficacy of the suggested algorithms

Keywords Resource allocation · Cloud · Big data · Deadline · Utilisation cost · Migration · CDSLnO

1 Introduction

In the modern era of computing such as bioinformatics, astronomy, physics, smart computing, weather data analysis, and modelling, and for any data-driven scientific applications, cloud computing with Big data application is used. All those technologies are dependent on fair share policy of task scheduling and resource

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CICN 2020

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Analysis of Data Aggregation Methods to avoid Data Redundancy in Wireless Sensor Network

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***Abstract*- Internet of Things (IoT) may be with large number of different technologies to make devices capable to interact with each other. The IoT with all these advanced technologies and devices making a rapid change of society towards easier and smarter. In IoT environment, nodes or sensors may used to collect the data and wireless communication technologies are used to transceive sensed data. IoT can involve number of sensor nodes, but with limited sensing, computational, and communication capabilities. Due to such limitations, the data size should be lower weight to improve the efficiency of the sensor nodes and bandwidth utilization of a network. To achieve network efficiency by avoiding data redundancy, the concept of data aggregation came into the picture. Data aggregation is the process of combining data from various sources and route them after removing redundancy such as to improve the overall network lifetime. When data aggregation is performed a notable communication complexity reduction rate and energy consumption reduction rate observed, hence we have studied and analyzed various Data Aggregation methods with their working methodology, features, limitations, drawbacks, results, etc. to conclude best suitable.**

***Keywords*– Sensors; Data Aggregation; Wireless Sensor Network**

I. WIRELESS SENSOR NETWORKS

Internet of Things (IoT) ecosystem involves physical devices like sensors and actuators with the Internet. As per the requirement of data, different types of sensors are available to sense the values from an environment. Sensors make IoT capable for smarter decisions by collected data as input. Sensors are capable to sense the data such as magnetic, thermal, seismic, visual, infrared, acoustic, noise level, rain, soil erosion, radar, temperature, pressure, humidity, vibration, radiation, object movement, object presence, mechanical stress levels, color, speed, direction, and also the size. Sensors can be use for continuous sensing, event detection, location sensing, and local control. [1]

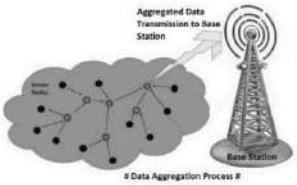
The IoT consists of sensor network so that sensor can interact. The IoT involves various heterogeneous technologies and devices that make possible for interaction. Today mostly systems are based on smart sensor networks mainly wirelessly known as a Wireless Sensor Network (WSN). WSN senses the values in an environment from scattered sensor devices. WSN should provide energy-efficient, flexible and low-cost wireless communication for system automation applications, therefore routing protocols of networks must be design by considering the limitations of power, processor's capacity, and memory of sensor devices.

II. DATA AGGREGATION

In WSN, the number of sensors sensed the application-specific data and transferred to a central Base Station (BS) to processed, analyzed, and used by the applications; such distributed in-network processing of data is generally referred to as Data Aggregation (DA). In these limited resources network, the normal approach is to first perform jointly processing of data before forwarded toward the BS. DA schemes describe the way for collecting the data which may be either event-driven, time-driven query-driven or both time and event (hybrid) driven.

Without DA, sensor nodes perform reporting with all the raw data to the sink i.e. the transmission of redundant data is meaningless that tend to various drawbacks: 1) repeated data transmission 2) increase in network traffic, demands of large bandwidth 3) increase in network congestion, and 4) increase in energy and time consumption.

DA is a process for statistical analysis where information is collected and expressed in summary form. The collected data relates to an event in sensor network or it's around. It minimizes repeated transmissions to the sink by aggregating and eliminating similar data from multiple nodes.



III. ISSUES WITH DATA AGGREGATION

DA has the following issues as:

1) Redundancy: Increase of number of nodes in network causes the increase of data redundancy. Some sensor nodes sense the same kind of data, and forward it all to sink node over the network. This leads to the energy wastage for transmission of redundant data. Therefore, the methods for elimination of such redundant data to enhance the network

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