

3.3.2

Books/ Conferences/ Book Chapters During Assessment Period: 2018-19 to 2022-23



SRI SIVANI COLLEGE OF ENGINEERING

(Under the Management of Sri Sivani Educational Society, Srikakulam)
(Approved by AICTE, New Delhi and Affiliated to JNTUGV, Vizianagaram-CC-W6
UGC Recognition under 2(f) & 12(B), ISO 9001:2015 Certified)
NH-16, Chilakapalem Jn., Srikakulam Dist. Andhra Pradesh -532410
. Andhra Pradesh -532410



SRI SIVANI COLLEGE OF ENGINEERING

(Under the Management of Sri Sivani Educational Society, Srikakulam)

Approved by AICTE, New Delhi and Affiliated to JNTUGV, Vizianagaram (CC:W6)
Recognised by UGC U/S 2 (f) & 12 (B)

ISO 9001 : 2015
CERTIFIED CAMPUS

NH-16, Chilakapalem (Jn), Etcherla (M), Srikakulam - 532 410, A.P., Tel : : 08942 231106, 73826 51411

Books/ Conferences/ Book Chapters During Assessment Period: 2018-19 to 2022-23

S.No.	Name of the Teacher	Title of the Book/Chapters Published	Title of the Paper	Year of Publication	ISBN/ISSN number of the proceeding
1	S. Laxmanaraju	Animal waste-based composites: a case study 4.1 Influence of animal tooth powder on mechanical and microstructural characteristics of Al6061 MMCs manufactured through Ultrasonic assisted stir casting technique		2023	978-3-11-076640-0
2	S. Laxmanaraju	Effects of incorporation of rock dust particles to friction stir processed AA7075 on the microstructure and mechanical properties		2023	978-3-11-076640-0
3	M. Jayakrishna	5G Building cloud networks and internet software evolution		2023	978-93-94707-56-6
4	G Tulasichandra Sekhar	Industrial Electronics		2022	978-93-91117-91-7
5	G Tulasichandra Sekhar		Moth Flame Optimization Algorithm Optimized Modified TID Controller for Automatic Generation Control of Multi Area Power System	2022	978-981-19-3088-1



SRI SIVANI

GROUP OF COLLEGES

SRI SIVANI COLLEGE OF ENGINEERING
SRI SIVANI COLLEGE OF PHARMACY
SRI SIVANI POLYTECHNIC

E-mail : info@srisivani.com, principal_w6@yahoo.co.in,

Website : www.srisivani.com

6	G Tulasichandra Sekhar		Fractional-Order Euler-Lagrange Dynamic Formulation and Control of Asynchronous Switched Robotic Systems	2022	978-981-16-4538-9
7	G Tulasichandra Sekhar	Intelligent Computing in Control and Communication		2021	978-981-15-8439-8
8	G Tulasichandra Sekhar	Improvement of fuel cell MPPT performance with a fuzzy logic controller, Renewable Energy Systems		2021	978-0-12-820004-9
9	G Tulasichandra Sekhar	Fractional-order controller design and implementation for maximum power point tracking in photovoltaic panels, Renewable Energy Systems		2021	978-0-12-820004-9
10	G Tulasichandra Sekhar		Robust Control and Synchronization of Fractional-Order Complex Chaotic Systems with Hidden Attractor	2021	978-981-16-3245-7
11	G Tulasichandra Sekhar		Automatic Generation Control of Multi-area Multi-source Deregulated Power System Using Moth Flame Optimization Algorithm	2021	978-981-16-1089-9
12	G Tulasichandra Sekhar		Design Guidelines for Vector Control of Wound Field Synchronous Motor	2021	978-981-15-8217-2
13	G Tulasichandra Sekhar		Impact of Ultra Capacitor on Automatic Load Frequency Control of Nonlinear Power System	2021	978-981-15-8439-8

14	G Tulasichandra Sekhar		Frequency Regulation of Hybrid Power Systems with Robust Higher-Order Sliding Mode Control	2021	978-981-15-8439-8
15	Tata kondala Rao		Synthesis and Characterization of Zinc oxide @ silver ferrite multiferroic nanocomposite	2021	2214-7853
16	G Tulasichandra Sekhar	Circuit Theory and Electronic Devices		2021	978-93-91117-09-2
17	G Tulasichandra Sekhar	Electrical Appliances		2021	978-81-651661-1-4
18	G Tulasichandra Sekhar	Digital Electronics		2021	978-93-91117-34-4
19	S.Laxmana Raju	Multi-Objective Optimization for Enhanced Surface Roughness and Microhardness of AA 6063/TiO ₂ Cast Aluminium Metal Matrix Nanocomposites Fabricated by Friction Stir Processing		2020	9780429355 998
20	R Pavan Kumar	Multi-Objective Optimization for Enhanced Surface Roughness and Microhardness of AA 6063/TiO ₂ Cast Aluminium Metal Matrix Nanocomposites Fabricated by Friction Stir Processing		2020	9780429355 998
21	G Tulasichandra Sekhar	Impact of IoT in Healthcare: Improvements and Challenges, The Digitalization Conundrum in India Applications, Access and Aberrations		2020	978-981-15-6907-4

22	Dabbeeru Priyanka		Empirical Analysis of Absenteeism at Work Place Using Machine Learning	2020	978-3-030-30271-9
23	Janmenjoy Nayak		Empirical Analysis of Absenteeism at Work Place Using Machine Learning	2020	978-3-030-30271-9
24	H Swapna Rekha		Soft Computing in Robotics: A Decade Perspective	2020	978-3-030-30271-9
25	Janmenjoy Nayak		Soft Computing in Robotics: A Decade Perspective	2020	978-3-030-30271-9
26	Janmenjoy Nayak		Applications and Advancements of Nature-Inspired Optimization Algorithms in Data Clustering: A Detailed Analysis	2020	978-981-13-8676-3
27	Janmenjoy Nayak		Significance of Particle Swarm Optimization in Intrusion Detection: Crossing a Decade	2020	978-3-030-30271-9
28	G Tulasichandra Sekhar		Golf-Worm Swarm Optimized 2DOF-PIDN Controller for Frequency Regulation of Hybrid Power System	2020	978-981-15-2449-3
29	G Tulasichandra Sekhar		Fuzzy PID Controller for Automatic Generation Control of Interconnected Power System Tuned by Glow-Worm Swarm Optimization	2020	978-3-030-30271-9
30	G Tulasichandra Sekhar		Sine Cosine Optimization Based Proportional Derivative-Integral Derivative Controller for Frequency Control of Hybrid Power System	2020	978-981-13-8676-3

31	S Laxmana Raju		Multi-objective Optimization of Submerged Friction Stir Welding Process Parameters for Improved Mechanical Strength of AA6061 Weld Bead by Using Taguchi-L18-Based Gray Relational Analysis	2020	978-981-15-1201-8
32	J. Bala Bhaskara Rao		Influence of double elliptical leaf angle with same orientation and direction to evaluate thermal performance in double pipe heat exchanger, Innovative Product Design and Intelligent Manufacturing Systems	2019	978-981-15-2696-1
33	B. Murali Krishna		Influence of double elliptical leaf angle with same orientation and direction to evaluate thermal performance in double pipe heat exchanger, Innovative Product Design and Intelligent Manufacturing Systems	2019	978-981-15-2696-1
34	G Tulasichandra Sekhar		Applications of Computational Intelligence Techniques for Automatic Generation Control Problem - A Short Review from 2010 to 2018	2019	978-981-13-9042-5
35	S Gopi		Applications of Computational Intelligence Techniques for Automatic Generation Control Problem - A Short Review from 2010 to 2018	2019	978-981-13-9042-5

36	Halini Samalla		Applications of Computational Intelligence Techniques for Automatic Control Problem - A Short Review from 2010 to 2018	2019	978-981-13-9042-5
37	Janmenjoy Nayak		A Survey on Teaching-Learning-Based Optimization Algorithm: Short Journey from 2011 to 2017	2019	978-981-10-8055-5
38	G Tulasichandra Sekhar		A Survey on Teaching-Learning-Based Optimization Algorithm: Short Journey from 2011 to 2017	2019	978-981-10-8055-5
39	Janmenjoy Nayak	Kidney-Inspired Algorithm and Fuzzy Clustering for Biomedical Data Analysis, Big Data Analytics for Intelligent Healthcare Management		2019	978-0-12-818146-1
40	Janmenjoy Nayak	A Comprehensive Review and Performance Analysis of Firefly Algorithm for Artificial Neural Networks, Nature-Inspired Computation in Data Mining and Machine Learning		2019	978-3-030-28553-1
41	G Tulasichandra Sekhar	Soft Computing Techniques for Engineering Applications, Inderscience		2019	2049-405X
42	G Tulasichandra Sekhar	Advances and Challenges of Soft Computing in Data Mining		2019	2046-3391
43	G Tulasichandra Sekhar	Basic Electrical Engineering as per JNTUH		2019	978-93-5283-507-2

44	G Tulasichandra Sekhar	Basic Electrical Engineering		2019	978-93-5283-484-6
45	Janmenjoy Nayak	Computational Intelligence in Data Mining		2019	978-981-13-8675-6
46	Janmenjoy Nayak	Computational Intelligence in Pattern Recognition		2019	978-981-13-9042-5
47	G Tulasichandra Sekhar		TLBO Algorithm Optimized Fractional-Order PID Controller for AGC of Interconnected Power System	2018	978-981-13-0514-6
48	Halini Samalla		TLBO Algorithm Optimized Fractional-Order PID Controller for AGC of Interconnected Power System	2018	978-981-13-0514-6
49	Ch Jagan Mohana Rao		TLBO Algorithm Optimized Fractional-Order PID Controller for AGC of Interconnected Power System	2018	978-981-13-0514-6
50	Janmenjoy Nayak		Crow Search Optimization-Based Hybrid Meta-heuristic for Classification: A Novel Approach	2018	978-981-10-7871-2
51	Janmenjoy Nayak		Chemical Reaction Optimization: A Survey with Application and Challenges	2018	978-981-13-0514-6
52	Sura Papa Rao		Chemical Reaction Optimization: A Survey with Application and Challenges	2018	978-981-13-0514-6

53	N. Seetayya		Chemical Reaction Optimization: A Survey with Application and Challenges	2018	978-981-13-0514-6
54	P. Pradeep		Chemical Reaction Optimization: A Survey with Application and Challenges	2018	978-981-13-0514-6
55	Janmenjoy Nayak		Soft Computing-Based Intrusion Detection Approaches: An Analytical Study	2018	978-981-13-0514-6
56	M Murali Krishna		Empirical Analysis on Cancer Dataset with Machine Learning Algorithms	2018	978-981-13-0514-6
57	G V L Narayana		Empirical Analysis on Cancer Dataset with Machine Learning Algorithms	2018	978-981-13-0514-6
58	P Suneel		Empirical Analysis on Cancer Dataset with Machine Learning Algorithms	2018	978-981-13-0514-6
59	P Rama Rao		Empirical Analysis on Cancer Dataset with Machine Learning Algorithms	2018	978-981-13-0514-6
60	K. Dileep Kumar		Analysis of Cancer Data Set with Statistical and Unsupervised Machine Learning Methods	2018	978-981-13-1921-1
61	H. V. Bhagya Sri		Analysis of Cancer Data Set with Statistical and Unsupervised Machine Learning Methods	2018	978-981-13-1921-1
62	M. Murali Krishna		Analysis of Cancer Data Set with Statistical and Unsupervised Machine Learning Methods	2018	978-981-13-1921-1

63	Dabbeeru Priyanka		Analysis of Various Fraud Behaviors Using Soft Computing Techniques	2018	978-981-13-0514-6
64	H. V. Bhagya Sri		Analysis of Various Fraud Behaviors Using Soft Computing Techniques	2018	978-981-13-0514-6
65	B G Lakshmi		Student Performance Analysis with Using Statistical and Cluster Studies	2018	978-981-13-0514-6
66	H Swapna Rekha		Student Performance Analysis with Using Statistical and Cluster Studies	2018	978-981-13-0514-6
67	M Dhana Lakshmi		Student Performance Analysis with Using Statistical and Cluster Studies	2018	978-981-13-0514-6
68	U Suvarna		Efficient High-Utility Itemset Mining Over Variety of Databases: A Survey	2018	978-981-13-0514-6
69	Janmenjoy Nayak	Soft Computing in Data Analytics		2018	978-981-13-0513-9
70	B Murali Krishna	Soft Computing in Data Analytics		2018	978-981-13-0513-9
71	G Tulasichandra Sekhar	Soft Computing in Data Analytics		2018	978-981-13-0513-9


IQAC


PRINCIPAL
PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chinakapalem Jn., SRIRAKULAM

Chapter 4

Animal waste-based composites: a case study

4.1 Influence of animal tooth powder on mechanical and microstructural characteristics of Al6061 MMCs manufactured through ultrasonic-assisted stir casting

Laxmanaraju Salavaravu*, Gopichand Dirisenapu, Lingaraju Dumpala, Remalle Ranjith Kumar, K. Satish Prakash

Abstract: This chapter examines the mechanical and microstructural behavior of novel Al6061 composites enhanced with biowaste, that is, animal tooth waste. Al6061 alloy MMCs with different weight percentages of animal tooth powder (ATP) were manufactured through ultrasonic-assisted stir casting (UASC) method. The ATP contains important components that make it a suitable reinforcement material for composites and its use also helps reduce the problem of disposal, to some extent. Microstructural studies of Al6061 composites using a scanning electron microscope (SEM) exposed the even dispersion of reinforcements. X-ray diffraction patterns and energy-dispersive X-ray spectroscopy (EDS) of the manufactured composites confirmed the presence of ATP in the Al matrix. The outcomes exposed that the ultimate tensile strength, yield tensile strength, and microhardness were increased up to a maximum of 37%, 38%, and 63%, respectively, and reduced while rising ATP. Enhancing ATP in the composites reduces the impact strength and percent elongation to a maximum of 64% and 62%. SEM micrographs exposed the existence and even distribution of ATP, and EDS analysis confirmed the occurrence of ATP in the composites.

Keywords: Composites, SEM, mechanical properties, ultimate tensile strength, yield tensile strength

4.1.1 Introduction

Metal matrix composites (MMCs) are an important engineering material in applications such as aerospace, defense, sports, transportation, aviation, and automobile [1]. Aluminum (Al)-based metal matrix composites (AMMC) are being used in different applications due to their excellent strength, stiffness, decreased weight, improved thermal and electrical characteristics, enhanced wear, and abrasion resistance and are

*Corresponding author: Laxmanaraju Salavaravu, e-mail: laxman.raju@yahoo.co.in

Chapter 5.3

Effects of incorporation of rock dust particles to friction stir processed AA7075 on the microstructure and mechanical properties

Gopichand Dirisenapu*, Laxmanaraju Salavaravu, Lingaraju Dumpala, Pagoti Lokesh, Satyanarayana Mallapu

Abstract: This study used different percentages of rock dust as reinforcement particles in AA7075 (0, 3, 6, 9, 12, and 15 wt%). Rock dust is a by-product of the crushing of rocks used to produce gravel aggregates. This research aims to assess the impact of rock dust reinforcements on mechanical characteristics and aluminum-based surface composites manufactured through friction stir processing (FSP). The rock dust particles are evenly distributed in the aluminum composites from scanning electron microscopic (SEM) observations. The fixed input variables in the FSP are 1,250 rpm tool rotational speed, 45 mm/min tool traverse speed, and 1° tool tilt angle. The output response revealed that adding rock dust particles increases with enhanced wear resistance. The ultimate tensile strength and microhardness enhanced with rock dust particles in the aluminum material, and the impact strength was reduced. The surface morphology of the wear samples was observed using SEM.

Keywords: Friction stir processing, rock dust, mechanical properties

5.3.1 Introduction

Aluminum is one of the most often used metals due to its low weight and strong corrosion resistance. Due to its superior strength-to-weight ratio, AA7075 is widely employed in aviation, aerospace, and national defense. Manufacturing defects including porosity and cracks cause localized corrosion in AA7075. Age hardening, particle reinforcing, and surface coatings are used to control corrosion. The reinforcement in the metal matrix impacts its strength and durability. Particle reinforcing is an useful way to increase mechanical properties. Particle reinforcing techniques include stir casting, ultrasonic stir casting, and friction stir processing (FSP) [1–3].

Most researchers have recently focused on FSP as an innovative alternative to the friction stir welding technique in manufacturing aluminum-based surface composites. A rotatable tool is pressed downward and dissolves the reinforcing phase uniformly across the matrix [4]. Pasha et al. [5] investigated the use of FSP to manufacture AA7075 matrix surface composites (AMSC). Variation of process parameters such as

*Corresponding author: Gopichand Dirisenapu, e-mail: dchandu310@gmail.com

5G

Building Cloud Networks and Internet Software Evolution

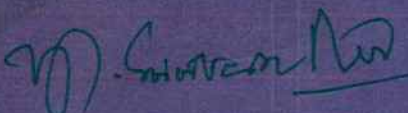
M. Jayakrishna

Dr. John Martin

Ms Dipalee D. Rane / Chaudhari

Dr. Herison Surbakti

Xoffencer


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Building Cloud Networks and Internet Software Evolution

Editors:

- M. Jayakrishna
- Dr. John Martin
- Ms Dipalee D. Rane / Chaudhari
- Dr. Herison Surbakti

Xoffencer

www.xoffencerpublication.in



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIRAKULAM

Copyright © 2023 Xoffencer

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through Rights Link at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

ISBN-13: 978-93-94707-56-6 (paperback)

Publication Date: 16 March 2023

Trademarked names, logos, and images may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, logo, or image we use the names, logos, and images only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

MRP: ₹450/-




PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Published by:

Xoffencer International Publication

Behind shyam vihar vatika, laxmi colony

Dabra, Gwalior, M.P. – 475110

Cover Page Designed by:

Satyam soni

Contact us:

Email: mr.xoffencer@gmail.com

Visit us: www.xoffencerpublication.in

Copyright © 2023 Xoffencer



PRINCIPAL

SRI SIVANI COLLEGE OF ENGINEERING

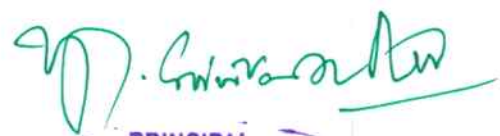
Chilakapalem Jn., SRIKAKULAM

Author Details



M. Jayakrishna

M. Jayakrishna, currently working as an Assistant Professor in Mechanical Engineering Department at Sri Sivani college of Engineering, Srikakulam (AP) India. I did my M. Tech. in Thermal Engineering from GMR Institute of Technology, Rajam in 2022; B.Tech. in Mechanical Engineering from GMR Institute of Technology, Rajam in 2020. My areas of research are 3D printing, Nano materials, composites, Bio fuels, Engines. I published 6 papers in UGC/Scopus Journals.



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chinakapalem Jn., SRIRAKULAM

Abstract

The ability of a buzzword to provide the appearance of meaning without really expressing that meaning is a distinguishing quality shared by all buzzwords. This perception of meaning may be conveyed without actually communicating the meaning. A great number of individuals are beginning to see the notion of "cloud computing" as if it were a foreign language. It is used in a broad range of contexts, and it often refers to subjects that do not seem to have any connection whatsoever. During one conversation, they discuss Google Gmail, and then, during the subsequent conversation, they discuss Amazon Elastic Compute Cloud (at least the latter has the term "cloud" in its name. Programrs and system administrators who are building transactional web applications in any cloud environment will find this manual to be comprehensive and all. encompassing. As I sit here and write this book, the term "cloud infrastructure" has come to be synonymous for the majority of people working in the cloud with Amazon Elastic Compute Cloud (EC2) and Amazon Simple Storage Service (S3). Because of this reality as well as the fact that I will be using examples from the Amazon cloud, it is vital for me to present an overview of cloud computing while putting an emphasis on the Amazon cloud. The vast majority of individuals who read this book have prior expertise in the creation of web applications that are hosted in traditional data centers. Now that we have a solid comprehension of what the cloud is and how cloud computing is done by Amazon, it is time to have a look at the challenges that you can face while moving your activities onto the cloud. Create a web application that is extremely scalable by doing what you would do anyway If your application can function behind a load balancer across a number of application server nodes without encountering any issues, you are essentially good to go, barring any particular regulatory or standards compliance concerns that may arise.

Contents

Chapter No.	Chapter Names	Page No.
Chapter 1	Cloud Computing	1-40
Chapter 2	Amazon Cloud Computing	41-71
Chapter 3	Before The Move Into The Cloud	72-99
Chapter 4	Ready For The Cloud	100-139
Chapter 5	Security	140-167
Chapter 6	Disaster Recovery	168-190
Chapter 7	Scaling A Cloud Infrastructure	191-211

Industrial Electronics

Dr. Karedla Chitambara Rao
Dr. Ramana Pilla
Dr. G. T. Chandra Sekhar



SHREE PUBLISHING HOUSE

Dr. Srinivasulu

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

Industrial Electronics

Dr. K. Chitambara Rao

M.Tech, Ph.D, MISTE, MIE(I)

Associate Professor

Department of Electronics & Communication Engineering
Aditya Institute of Technology and Management
Tekkali, AP, India.

Dr. Ramana Pilla

M.Tech, Ph.D, MISTE, MIE(I)

Professor

Department of Electrical & Electronics Engineering
GMR Institute of Technology
Rajam, AP, India.

Dr. G.T. Chandra Sekhar

M.Tech, Ph.D, MISTE, MIE(I)

Vice-Principal

Department of Electrical & Electronics Engineering
Sri Sivani College of Engineering
Srikakulam, AP, India.



Visakhapatnam, Andhra Pradesh

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

ISBN: 978-93-91117-91-7

Price : Rs. 150.00

Shree Publishing House

Office:

Flat -23, Block No. 2 LIG-II, APHB Colony,
Kommadi, Madhurawada, Visakhapatnam-530048
Andhra Pradesh
Phone No- 9948250752, 9398778826
Email: shreepublishinghouse@gmail.com

ii

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

PREFACE

This book is designed based on the AICTE model curriculum for graduate students, those who study industrial electronics as one of the core subjects in their curriculum. The primary goal of this book is to establish a firm understanding of the basic knowledge of rectifiers and filters, voltage regulators, power supplies, voltage multipliers, controlled rectifiers, and electric heating. The contents of this book are presented in a simple way for easy understanding of students and can be used as a self-study material. Additional solved problems, multiple choice questions and review questions have been provided at the end of each chapter.

This book contains six chapters and is organized as follows:

Chapter-1 deals with rectifiers and filters: It describes the operation and mathematical analysis of half wave rectifier, full wave rectifier. It also deals with different types of filters such as L, C, LC and CLC filters.

Chapter-2 deals with voltage regulators: It describes the basic operation and principle of various voltage regulators such as voltage regulator using Zener diode, discrete transistor voltage regulator and three terminal fixed voltage IC regulators.

Chapter-3 deals with power supplies: It discusses various power supplies such as DC variable bench power supply, linear variable bench power supplies and switching mode power supplies. It also focuses on buck converter, boost converter, buck-boost converter, and applications of switch mode power supply (SMPS) as well as regulated power supplies.

Chapter-4 deals with voltage multipliers: It describes the basic operation and principle of various voltage multipliers such as voltage doublers, voltage tripler and voltage quadrupler along with their applications.

Chapter-5 deals with controlled rectifiers: It describes working of SCR, operation of rectifiers and inverters. Applications of rectifiers and inverters are also discussed in chapter-5.

Chapter-6 deals with electric heating: It focuses on advantages of electric heating, modes of heat transfer, requirements of good heating material and design of heating element. It also describes the basic operation and principle of various methods of electric heating such as resistance heating, induction heating and dielectric heating.


- Authors



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM



Moth Flame Optimization Algorithm Optimized Modified TID Controller for Automatic Generation Control of Multi Area Power System

K. Alfoni Jose¹, G. Raam Dheep¹, and Tulasichandra Sekhar Gorripotu²(✉) 

¹ School of Electronics and Electrical Engineering, Lovely Professional University, Grand Trunk Rd, Jalandhar, Delhi, Phagwara 144001, Punjab, India
alfonikezhiyur@gmail.com

² Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering, Srikakulam 532410, Andhra Pradesh, India
gtchsekhar@gmail.com, gtchsekhar@srisivani.com

Abstract. In this paper, a new nonlinear controller called integral derivative-tilted (ID-T) is developed for the automatic generation control (AGC) issue of a multi-area interconnected thermal power system. The parameters of the proposed ID-T controller are fine-tuned using a novel optimization algorithm known as Moth Flame Optimization (MFO). The effectiveness of the proposed ID-T controller structure is evaluated on a four-area interconnected reheat thermal power system. To confirm the efficiency of the proposed MFO-based ID-T controller, inclusive comparative performance is implemented and compared with TID controller and integral controller. The comparison of results exhibits that the proposed ID-T controller presents a significant improvement in settling time, undershoot, and overshoot.

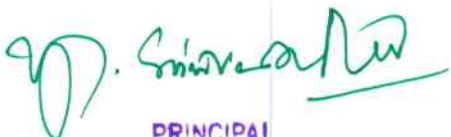
Keywords: AGC · ID-T · ITAE · MFO

1 Introduction

The present-day power system has become more complex as it comprises diverse sources, loads, and the expansion of non-conventional energy sources. Due to the increase in load demand, there may be a mismatch between generation and demand load. This creates the concern of power grid stability and security. Hence, the speed control system in automatic generation control (AGC) will help reduce the frequency and tie-line power differences in the power grid. However, the speed that controls the system is not enough for the new control grid to reduce these parameters. Therefore, the incorporation of secondary controllers is essential to minimize the deviations demonstrated by numerous researchers [1–5].

Most of the researchers reported the implications for AGC with various techniques and controllers. They have also explained the fine tuning process of various controllers. Pradhan et al. [6] have employed teaching learning-based optimization (TLBO) based fuzzy PIDN controller for multi-area power systems and shown its ability by comparative

© The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2022
A. K. Das et al. (Eds.): CIPR 2022, LNNS 480, pp. 644–652, 2022.
https://doi.org/10.1007/978-981-19-3089-8_60


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Fractional-Order Euler–Lagrange Dynamic Formulation and Control of Asynchronous Switched Robotic Systems



Ahmad Taher Azar, Fernando E. Serrano, Nashwa Ahmad Kamal, Sandeep Kumar, Ibraheem Kasim Ibraheem, Amjad J. Humaidi, Tulasichandra Sekhar Gorripotu, and Ramana Pilla

Abstract This paper presents an asynchronous distributed switched controller for robotic systems with a dynamic model derivation based on fractional-order Euler–Lagrange formulation. This study begins with the dynamic model derivation of a two links robotic manipulator by a fractional-order Euler–Lagrange formulation. This objective is achieved by selecting an appropriate Lagrangian, considering the linear

A. T. Azar

College of Computer and Information Sciences, Prince Sultan University, Riyadh, Saudi Arabia
e-mail: aazar@psu.edu.sa; ahmad.azar@fci.bu.edu.eg; ahmad_t_azar@ieee.org

Faculty of computers and Artificial Intelligence, Benha University, Banha, Egypt

F. E. Serrano

Research Collaborator, Prince Sultan University, Riyadh, Saudi Arabia
e-mail: serranofer@eclipso.eu

International Group of Control Systems (IGCS), Cairo, Egypt

N. A. Kamal

Faculty of Engineering, Cairo University, Giza, Egypt

S. Kumar (✉)

School of Engineering and Technology, CHRIST (Deemed to be University), Bengaluru, India

I. K. Ibraheem

Department of Electrical Engineering, College of Engineering, University of Baghdad,
Al-Jadriyah, Baghdad
10001, Iraq
e-mail: ibraheemki@coeng.uobaghdad.edu.iq

A. J. Humaidi

Department of Control and Systems Engineering, University of Technology, Baghdad 10001, Iraq
e-mail: 601116@uotechnology.edu.iq

T. S. Gorripotu

Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering,
Srikakulam 532402, Andhra Pradesh, India

R. Pilla

Department of Electrical and Electronics Engineering, GMR Institute of Technology,
Rajam Srikakulam 532127, Andhra Pradesh, India
e-mail: ramana.pilla@gmr.it.edu.in

© The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2022
R. C. Poonia et al. (eds.), *Proceedings of Third International Conference on Sustainable Computing*, Advances in Intelligent Systems and Computing 1404,
https://doi.org/10.1007/978-981-16-4538-9_47

479

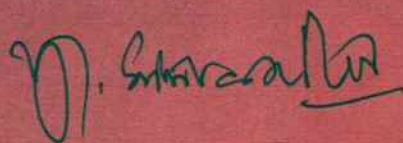
PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitlakapalem Jn., SRIKAKULAM

Lecture Notes in Electrical Engineering 702

G. T. Chandra Sekhar · H. S. Behera ·
Janmenjoy Nayak · Bighnaraj Naik ·
Danilo Pelusi *Editors*

Intelligent Computing in Control and Communication

Proceeding of the First International
Conference on Intelligent Computing in
Control and Communication (ICCC 2020)



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM


 Springer

G. T. Chandra Sekhar · H. S. Behera ·
Janmenjoy Nayak · Bighnaraj Naik ·
Danilo Pelusi
Editors


Intelligent Computing in Control and Communication

Proceeding of the First International
Conference on Intelligent Computing
in Control and Communication (ICCC 2020)


 Springer


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM


Editors

G. T. Chandra Sekhar 
Department of Electrical and Electronics
Engineering
Sri Sivani College of Engineering (SSCE)
Srikakulam, Andhra Pradesh, India

H. S. Behera 
Department of Information Technology
Veer Surendra Sai University of Technology
Burla, Odisha, India

Janmenjoy Nayak 
Department of Computer Science
and Engineering
Aditya Institute of Technology
and Management (AITAM)
Srikakulam, Andhra Pradesh, India

Bighnaraj Naik 
Department of Computer Application
Veer Surendra Sai University of Technology
Burla, Odisha, India

Danilo Pelusi 
Faculty of Communication Sciences
University of Teramo, Coste Sant'agostino
Campus
Teramo, Italy

ISSN 1876-1100 ISSN 1876-1119 (electronic)
Lecture Notes in Electrical Engineering
ISBN 978-981-15-8438-1 ISBN 978-981-15-8439-8 (eBook)
<https://doi.org/10.1007/978-981-15-8439-8>

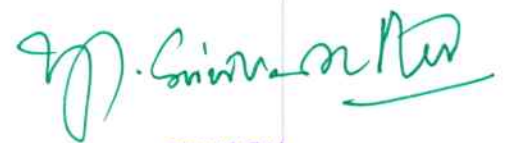
© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2021

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jri., SRIKAKULAM

Improvement of fuel cell MPPT performance with a fuzzy logic controller

Arezki Fekik^{1,2}, Ahmad Taher Azar^{3,4}, Hakim Denoun², Nashwa Ahmad Kamal⁵, Naglaa K. Bahgat⁶, Tulasichandra Sekhar Gorripotu⁷, Ramana Pilla⁸, Fernando E. Serrano⁹, Shikha Mittal¹⁰, K.P.S. Rana¹¹, Vineet Kumar¹¹, Sundarapandian Vaidyanathan¹², Mohamed Lamine Hamida², Nacera Yassa¹ and Karima Amara²

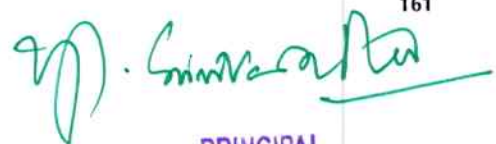
¹Akli Mohand Oulhadj University, Bouira, Algeria, ²Electrical Engineering Advanced Technology Laboratory (LATAGE), Mouloud Mammeri University, Tizi Ouzou, Algeria, ³Faculty of Computers and Artificial Intelligence, Benha University, Benha, Egypt, ⁴College of Computer and Information Sciences, Prince Sultan University, Riyadh, Saudi Arabia, ⁵Faculty of Engineering, Cairo University, Giza, Egypt, ⁶Electrical Communication Department, Faculty of Engineering, Canadian International College (CIC), Giza, Egypt, ⁷Department of Electrical & Electronics Engineering, Sri Sivani College of Engineering, Srikakulam, India, ⁸Department of EEE, GMR Institute of Technology, Rajam, India, ⁹Universidad Tecnológica Centroamericana (UNITEC), Zona Jacaleapa, Tegucigalpa, Honduras, ¹⁰Department of Mathematics, Jesus and Mary College, University of Delhi, New Delhi, India, ¹¹Division of Instrumentation and Control Engineering, Netaji Subhas University of Technology, Dwarka, India, ¹²Research and Development Centre, Vel Tech University, Chennai, India

8.1 Introduction

Existence has provided us with an enormous amount of energy in different forms. The energy conversion rule stipulates that it already exists and that it is neither produced nor lost, converted and represented only in any other form. Energy has two main categories: nonrenewable and renewable energy. Nonfuels emit many ozonated substances, such as carbon dioxide, which is the main cause of the rise in global temperature and global warming, which significantly affects the atmosphere due to the limited storage of nonrenewable petroleum-based energy (Ahmed & Salam, 2016; Femia, Petrone, Spagnuolo, & Vitelli, 2005; Gow & Manning, 1999; Masoum, Dehbonei, & Fuchs, 2002; Sera, Teodorescu, & Rodriguez, 2007; Xiao, Huang, & Kang, 2015). The increasing use of sustainable or renewable energy sources, in particular photovoltaic cells, biomass, wind power, and geothermal energy, has increased considerably. Photovoltaic technology is one of the fastest-growing innovations among the various renewable resources due to its abundant source of solar lighting and its negative environmental impact. Due to the advancement of electronic energy devices and control rules, there is a substantial increase in the demand for energy generated from photovoltaic systems (Amara et al., 2018, 2019a; Arezki Fekik et al., 2017; Azar et al., 2019; Denoun, Hamida, Fekik, Dyhia, & Ghanes, 2018; Fekik, Denoun, Benamrouche, Benyahia, & Zaouia, 2015; Fekik et al., 2018a; Fekik, 2018; Fekik et al. 2018b, 2018c, 2019; Ghodelbourk, Azar, Dib, & Omeiri, 2020; Hamida, Denoun, Fekik, & Vaidyanathan, 2019; Lamine, Hakim, Arezki, Nabil, & Nacerddine, 2018; Lamine et al., 2019). Nowadays, researchers around the world are studying and studying multiple sources of free energy to transform it into functional means.

As the supply of petrochemicals decreases, green and renewable technologies have become the first choice for their main electricity sources. Modern fuel cell (FC) technology is provided to overcome the limitations. FCs are used to convert energy from hydrogen to produce electricity. Several forms of FCs are based on their electrolytes. The following are widely used: (1) lower ambient temperature; (2) reduce operating pressure to increase safety; and (3) best convertibility ratio Bocci et al. (2014), Cipriani et al. (2014). FCs require a high construction cost if they are necessary for a high power application because they produce only a low output voltage.

A broad number of internal parameters can influence the FC's output voltage, but the IV curve represents a single point which represents the maximum output point (MPP) (Amara et al., 2019b; Ammar, Azar, Shalaby, & Mahmoud, 2019; Ben Smida, Sakly, Vaidyanathan, & Azar, 2018; Chavan & Talange, 2017; Fekik et al., 2021b; Ghodelbourk,



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

Fractional-order controller design and implementation for maximum power point tracking in photovoltaic panels

Ahmad Taher Azar^{1,2}, Fernando E. Serrano³, Marco A. Flores³, Nashwa Ahmad Kamal^{4,5}, Francisco Ruiz³, Ibraheem Kasim Ibraheem⁶, Amjad J. Humaidi⁷, Arezki Fekik^{8,9}, Kammogne Soup Tewa Alain¹⁰, Kengne Romanic¹⁰, K.P.S. Rana¹¹, Vineet Kumar¹¹, Tulasichandra Sekhar Gorripotu¹², Ramana Pilla¹³ and Shikha Mittal¹⁴

¹Faculty of Computers and Artificial Intelligence, Benha University, Benha, Egypt, ²College of Computer and Information Sciences, Prince Sultan University, Riyadh, Saudi Arabia, ³Instituto de Investigacion en Energia IIE, Universidad Nacional Autónoma de Honduras (UNAH), Tegucigalpa, Honduras, ⁴Faculty of Engineering, Cairo University, Giza, Egypt, ⁵International Group of Control Systems (IGCS), Riyadh, Saudi Arabia, ⁶Department of Electrical Engineering, College of Engineering, University of Baghdad, Baghdad, Iraq, ⁷Department of Control and Systems Engineering, University of Technology, Baghdad, Iraq, ⁸Akli Mohand Oulhadj University, Bouira, Algeria, ⁹Electrical Engineering Advanced Technology Laboratory (LATAGE), Mouloud Mammeri University, Tizi Ouzou Algeria, ¹⁰Laboratory of Condensed Matter, Electronics and Signal Processing (LAMACETS), Department of Physic, Faculty of Sciences, University of Dschang, Dschang, Cameroon, ¹¹Division of Instrumentation and Control Engineering, Netaji Subhas University of Technology, Dwarka, India, ¹²Department of Electrical & Electronics Engineering, Sri Sivani College of Engineering, Srikakulam, India, ¹³Department of Electrical & Electronics Engineering, GMR Institute of Technology, Rajam, Srikakulam, India, ¹⁴Department of Mathematics, Jesus and Mary College, University of Delhi, New Delhi, India

12.1 Introduction

Due to the increase in applications and solutions related to renewable energies, specifically in solar energy, it is necessary to provide novel strategies for the maximum power point tracking (MPPT) of photovoltaic (PV) panels (Amara et al., 2019; Ammar, Azar, Shalaby, & Mahmoud, 2019; Ben Smida, Sakly, Vaidyanathan, & Azar, 2018; Ghodelbourk, Dib, Omeiri, & Azar, 2016; Kamal, Azar, Elbasuony, Almustafa, & Almakhles, 2020; Kamal & Ibrahim, 2018). Due to an increase in the demand for solar energy generation and the fast-changing technologies related to solar energy and other renewable energies, new MPPT techniques are required to provide more robust strategies, accurate and with the capability to deal with uncertainties among other kinds of attributes, which are necessary for solar energy generation (Fekik et al., 2020).

First, it is important to mention some MPPT algorithms that are not necessarily based on automatic control because of the advantages to design and implement control techniques to maintain the maximum power extraction of PV panels when these kinds of algorithms do not provide the required robustness or disturbance rejection properties of control strategies. For example, in Kumar, Bhaskar, and Koti (2014), the comparison of the short-circuit method and the incremental conductance method is provided. Something important to remark is that in this study, the control circuit is simplified. Another interesting example can be found in Eltawil and Zhao (2013), in which some MPPT techniques are analyzed but considering other conditions, such as light, shade, and temperature and the grid connection in urban areas. In Visweswara (2014), the incremental conductance MPPT technique is evinced. This strategy consists of finding the optimum operating current for the maximum power extraction of PV panels and taking advantage of low-frequency switching. Besides, as shown in Logeswaran and SenthilKumar (2014), sometimes it is important to consider external conditions for MPPT, such as uniform and nonuniform irradiance. In Logeswaran and SenthilKumar (2014), some



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Chapter 15

Robust Control and Synchronization of Fractional-Order Complex Chaotic Systems with Hidden Attractor



Ahmad Taher Azar, Fernando E. Serrano, Nashwa Ahmad Kamal, Tulasichandra Sekhar Gorripotu, Ramana Pilla, Sandeep Kumar, Ibraheem Kasim Ibraheem, and Amjad J. Humaidi

1 Introduction

Hidden attractors are found in some chaotic systems when the domain of attraction is not the equilibrium point. Fractional-order chaotic systems have become a vital topic to be studied. The fractional-order dynamic model provides a more realistic mathematical model than integer order systems [1, 2]. It is important to remark that

A. T. Azar (✉)

College of Computer and Information Sciences, Prince Sultan University, Riyadh, Saudi Arabia

Faculty of computers and Artificial Intelligence, Benha University, Benha, Egypt
e-mail: aazar@psu.edu.sa; ahmad.azar@fci.bu.edu.eg; ahmad_t_azar@ieee.org

F. E. Serrano

Research collaborator at Robotics and Internet-of-Things Lab (RIOTU), International Group of Control Systems (IGCS), Prince Sultan University, Riyadh, Saudi Arabia
e-mail: serranofer@eclipso.eu

N. A. Kamal

Faculty of Engineering, Cairo University, Cairo, Egypt

T. S. Gorripotu

Department of Electrical & Electronics Engineering, Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh 532402, India

R. Pilla

Department of Electrical & Electronics Engineering, GMR Institute of Technology, Rajam Srikakulam, Andhra Pradesh 532127, India
e-mail: ramana.pilla@gmr.it.edu.in

S. Kumar

CHRIST (Deemed to be University), Bengaluru, Karnataka 560074, India

I. K. Ibraheem

Department of Electrical Engineering, College of Engineering, University of Baghdad, Al-Jadriyah, Baghdad 10001, Iraq
e-mail: ibraheemki@coeng.uobaghdad.edu.iq

© The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2021

S. Kumar et al. (eds.), *Proceedings of International Conference on Communication and Computational Technologies*, Algorithms for Intelligent Systems, https://doi.org/10.1007/978-981-16-3246-4_15

199

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chirakapalem Jn., SRIKAKULAM

Automatic Generation Control of Multi-area Multi-source Deregulated Power System Using Moth Flame Optimization Algorithm



B. V. S. Acharyulu, Tulasichandra Sekhar Gorripotu, Ahmad Taher Azar, Banaja Mohanty, Ramana Pilla, Sandeep Kumar, Fernando E. Serrano, and Nashwa Ahmad Kamal

Abstract In this paper, a novel nature motivated optimization technique known as moth flame optimization (MFO) technique is proposed for a multi-area interrelated power system with a deregulated state with multi-sources of generation. A three-area interrelated system with multi-sources in which the first area consists of the thermal and solar thermal unit; the second area consists of hydro and thermal units. The third area consists of gas and thermal units with AC/DC link. System performances

B. V. S. Acharyulu
Department of Electrical and Electronics Engineering, Lendi Institute of Technology and Management, Srikakulam, Andhra Pradesh 532402, India

T. S. Gorripotu
Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh 532402, India

A. T. Azar
College of Computer and Information Sciences, Prince Sultan University, Riyadh, Saudi Arabia
Faculty of Computers and Artificial Intelligence, Benha University, Banha, Egypt

A. T. Azar
e-mail: aazar@psu.edu.sa; ahmad.azar@fci.bu.edu.eg

B. Mohanty
Department of Electrical Engineering, Veer Surendra Sai University of Technology, Burla, Odisha 768018, India

R. Pilla
Department of Electrical and Electronics Engineering, GMR Institute of Technology, Rajam, Srikakulam, Andhra Pradesh 532127, India
e-mail: ramana.pilla@gmrit.edu.in

S. Kumar (✉)
CHRIST (Deemed to be University), Bangalore, Karnataka 560074, India

F. E. Serrano
Universidad Tecnológica Centroamericana (UNITEC), Tegucigalpa, Honduras
e-mail: feserrano@unitec.edu; serranofer@eclipsos.edu

N. A. Kamal
Faculty of Engineering, Cairo University, Giza, Egypt

© The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2021
H. Sharma et al. (eds.), *Communication and Intelligent Systems*, Lecture Notes in Networks and Systems 204, https://doi.org/10.1007/978-981-16-1089-9_56

717

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Design Guidelines for Vector Control of Wound Field Synchronous Motor



Ramana Pilla and G. Tulasichandra Sekhar

Abstract This paper proposes a universal design approach for the speed control loop of an inverter-fed wound field synchronous motor (WFSM) drive. For various combinations of currents, same torque is generated due to its inherent flexibility. The WFSM is designed in closed-loop system and simulated using MATLAB/SIMULINK environment. For various cases like control of unity power factor (u.p.f) angle, control of torque angle and field-based control, the system is simulated under different power factors and the corresponding performance figures are obtained. From the performance figures, it is clear that the design guidelines give the clarity for a wider range of two angles, i.e. δ and ψ and hence ϕ and one can predict the physical implementation of the control system for its betterment. These design guidelines also give the flexibility in choosing the p.f. of the motor from lagging to leading through unity.

Keywords Field-oriented control · Torque angle control · u.p.f. angle control · WFSM

1 Introduction

A synchronous motor actually runs with the power supply network “in time” or “in synchronization”. Industries are increasingly using such motors because of their different operating characteristics [1]. Due to their high performance and power factor correction capability, synchronous motor drives [2, 3] have a wide variety of industrial applications. For end users, these motors giving major economic and operational benefits due to its features like high torque, constant speed under load variation, as well as low maintenance.

R. Pilla

Department of Electrical and Electronics Engineering, GMR Institute of Technology, Rajam
532127, Andhra Pradesh, India
e-mail: ramana.pilla@gmrit.edu.in; pramana.gmrit@gmail.com

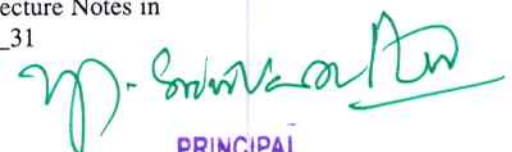
G. Tulasichandra Sekhar (✉)

Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering,
Srikakulam, Andhra Pradesh 532410, India
e-mail: gtchsekhar@gmail.com; gtchsekhar@srisivani.com

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer
Nature Singapore Pte Ltd. 2021


R. Sharma et al. (eds.), *Green Technology for Smart City and Society*, Lecture Notes in
Networks and Systems 151, https://doi.org/10.1007/978-981-15-8218-9_31

367


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Impact of Ultra Capacitor on Automatic Load Frequency Control of Nonlinear Power System



Tulasichandra Sekhar Gorripotu , Ahmad Taher Azar, Ramana Pilla, and Nashwa Ahmad Kamal

Abstract This article focuses on the performance of an ultra capacitor in a two-area reheat thermal power system for automatic load frequency control (ALFC). Initially, the power system model is designed in MATLAB/SIMULINK environment. Then, differential evolution (DE) technique based on two degree of freedom tilt integral derivative (2-DOF-TID) controller is placed as secondary controller. In order to improve the system's transient reactions, ultra capacitors (UCs) are mounted in each region, and their output is observed. Finally, the sensitivity has been analyzed to demonstrate the effectiveness of the proposed concept.

Keywords Automatic load frequency control (ALFC) · Differential evolution (DE) · Two degree of freedom tilt integral derivative (2-DOF-TID) controller · Ultra capacitors (UC)

T. S. Gorripotu (✉)

Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh 532410, India
e-mail: gtchsekhar@gmail.com; gtchsekhar@srisivani.com

A. T. Azar

Robotics and Internet-of-Things Lab (RIOTU), Prince Sultan University, Riyadh 11586, Saudi Arabia
e-mail: aazar@psu.edu.sa; ahmad.azar@fci.bu.edu.eg

Faculty of Computers and Artificial Intelligence, Benha University, Benha, Egypt

R. Pilla

Department of Electrical and Electronics Engineering, GMR Institute of Technology, Rajam, Andhra Pradesh 532127, India
e-mail: ramana.pilla@gmrit.edu.in; pramana.gmrit@gmail.com

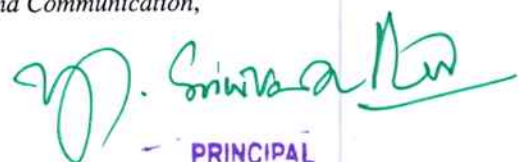
N. A. Kamal

Faculty of Engineering, Cairo University, Giza, Egypt
e-mail: nashwa.ahmad.kamal@gmail.com

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2021

G. T. C. Sekhar et al. (eds.), *Intelligent Computing in Control and Communication*, Lecture Notes in Electrical Engineering 702, https://doi.org/10.1007/978-981-15-8439-8_27

333


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Frequency Regulation of Hybrid Power Systems with Robust Higher-Order Sliding Mode Control



L. V. Suresh Kumar, Tummala S. L. V. Ayyarao,
and Tulasichandra Sekhar Gorripotu

Abstract Increased renewable energy additions and load fluctuations in the power system lead to large frequency fluctuations due to intermittent nature of renewable energy systems. The main scope of this paper is to regulate the frequency deviations in the power system by automatically controlling speed governor of thermal power plant. A nonlinear disturbance observer (NDO) has been used to find the net disturbance as well as those results of the frequency deviation are estimated with same method NDO. For controlling the system frequency of a new approach, control method is developed with higher-order sliding mode control (HOSMC). This proposed idea of frequency regulation is evaluated for single-area hybrid power system for various working methods. System output characteristics are shows the superior performance of the HOSMC for better power system operation.

Keywords Frequency regulation · Nonlinear disturbance observer · Sliding mode control · Thermal power plant

1 Introduction

With increased energy demand, change in government policies (carbon reduction), increased revenue resulted in renewable energy additions in power systems. In US, the wind energy additions are raised up to 8.6 GW in 2015 [1]. According to Navigant

L. V. Suresh Kumar · T. S. L. V. Ayyarao
Department of Electrical & Eletronics Engineering, GMR Institute of Technology, Rajam, Andhra Pradesh 532127, India
e-mail: lvenkatasureshkumar@gmail.com

T. S. L. V. Ayyarao
e-mail: ayyarao.tslv@gmrit.edu.in

T. S. Gorripotu (✉)
Department of Electrical & Eletronics Engineering, Sri Sivani College of Engineering,
Chilakapalem, Srikakulam, Andhra Pradesh 532410, India
e-mail: gtchsekhar@gmail.com; gtchsekhar@srisivani.com

© The Editor(s) (if applicable) and The Author(s), under exclusive license
to Springer Nature Singapore Pte Ltd. 2021
G. T. C. Sekhar et al. (eds.), *Intelligent Computing in Control and Communication*,
Lecture Notes in Electrical Engineering 702,
https://doi.org/10.1007/978-981-15-8439-8_37

453

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM




Synthesis and characterization of zinc oxide @ silver ferrite multiferroic nanocomposite


Tata Kondala Rao  


Sri Sivani College of Engineering, Srikakulam, AP, India

Received 9 November 2020, Revised 14 January 2021, Accepted 19 January 2021, Available online 3 March 2021, Version of Record 23 September 2021.

Show less 

 Share  Cite

<https://doi.org/10.1016/j.matpr.2021.01.577> 


Get rights and content 

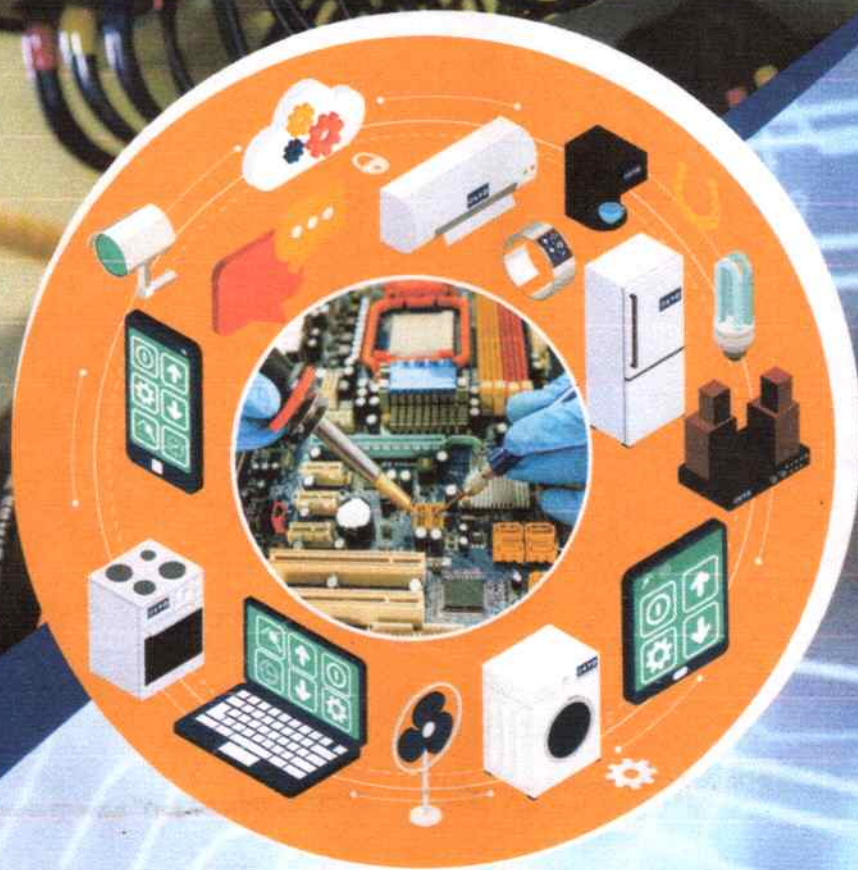
Abstract

Multiferroic substances have a several applications in microwave devices, photo-voltaic technologies, energy harvesting, magnetic sensors, solid-state refrigeration, data storage devises and random-access memories, etc. In this paper we present a detailed synthesis of a multiferroic nanozinc oxide-silver ferrite hybrid composite and its characterization. This method involves co-precipitation followed by sol gel technique. We achieved hybrid nanoparticles of size 38 nm with homogeneous orthorhombic silver ferrite distribution on tetragonal nano wurtzite ZnO. It was determined that the band gap of the hybrid material was less than undoped material and the hybrid material also exhibits soft ferromagnetic nature. These results reveal the synthesized nano ZnO@AgFeO₂ hybrid materials are multiferroic in nature when compared to their individual components.

Introduction

Multiferroics are presently have more focused because of their coexistence of both ferroelectric, ferromagnetic natures [1], [2]. Most of the research is on the magnetization driven by electrical field and magnetoelectric effect by applied magnetism [3], which helps to develop new perspective of ferromagnetic/ferroelectric devises such as storage gadgets for data, spintronics, magneto capacitive devices, nonvolatile memories, magnetic sensors and so forth [4], [5], [6], [7], [8], [9]. Due to its discovery, ferroelectricity is linked to the magnetism. Combination of the spin orders and dipole into one system were initiated in the 1960, single phase multiferroics such as boracites [10], Cr₂O₃ single crystal [10], [11], and fluorides (BaMF₄, M = Fe, Mn, Co, Ni) [12], [13], magnetite Fe₃O₄ [14], (YMnO₃) [15], and BiFeO₃ [16], were recognized


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM



Circuit Theory and Electronic Devices

Dr. Ramana Pilla
Dr. G.T. Chandra Sekhar



SHREE PUBLISHING HOUSE

D. Srinivasan
PRINCIPAL

SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Circuit Theory and Electronic Devices

Dr. Ramana Pilla

M.Tech, Ph.D, MISTE, MIE(I)

Professor

Department of Electrical & Electronics Engineering
GMR Institute of Technology
Rajam, AP, India.

Dr. G.T. Chandra Sekhar

M.Tech, Ph.D, MISTE, MIE(I)

Associate Professor

Department of Electrical & Electronics Engineering
Sri Sivani College of Engineering
Srikakulam, AP, India.



Visakhapatnam, Andhra Pradesh

Dr. G.T. Chandra Sekhar

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Every effort been made to avoid errors or omissions in the publication. In spite of this, errors may have crept in. Any mistake/error or discrepancy noted may be brought to our notice, which shall be taken care of in the next edition.

All rights are reserved

No part of this publication, which is material protected by this copyright notice, may be reproduced, stored in a retrieval system, or transmitted in any form or by any means -electronic, digital or mechanical, including photocopying, scanning, recording or otherwise, without prior written permission of the publisher.

First Edition - 2021
Copyright © Publisher

ISBN: 978-93-91117-09-2

Price : Rs. 260.00

Shree Publishing House

Office:

Flat -23, Block No. 2 LIG-II, APHB Colony,
Kommadi, Madhurawada, Visakhapatnam-530048
Andhra Pradesh
Phone No- 9948250752, 9398778826
Email: shreepublishinghouse@gmail.com


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

PREFACE

This book is designed based on AICTE model curriculum for graduate students, those who study Circuit Theory and Electronic Devices as one of the core subject in their curriculum. The primary goal of this book is to establish a firm understanding of the basic knowledge of DC Circuits, AC Circuits, Network Theorems, Resonance, RL/RC/RLC Circuits, Semiconductor Devices, Rectifiers & Regulators and Photo Electric Devices. The contents of this book are presented in a simple way for easy understanding of students and can be used as a self-study material. Additional Solved Problems, Multiple Choice Questions and Review Questions have been provided at the end of each chapter.

This book contains eight chapters and organized as follows:

Chapter-1 deals with DC Circuits: It describes the basic network elements, energy sources, Kirchoff's laws and network reduction techniques for network analysis.

Chapter-2 deals with AC circuits: It describes various wave forms including sinusoidal and other periodic wave forms for the evaluation of RMS value, average value, form factor and peak factor. It also focuses on the representation of phasors in the complex plane.

Chapter-3 deals with Network Theorems: It is devoted to various network theorems required for simplified analysis of electrical problems.

Chapter-4 deals with Resonance: It describes the resonance phenomenon in both series and parallel circuits.

Chapter-5 deals with RL, RC & RLC Circuits: It describes the frequency response and filter characteristics of RL, RC & RLC Circuits.

Chapter-6 deals with Semiconductor devices: It describes different materials such as conductors, insulators and semiconductors. It also provides classification of semiconductors, working and construction of PN junction diode, BJT, JFET and UJT.

Chapter-7 deals with Rectifiers: It describes the operation and mathematical analysis of half wave rectifier, full wave rectifier. It also deals with different types of filters such as L, C, LC and CLC filters.

Chapter-8 deals with Regulators & Photo Electric Devices: It describes the basic operation principle of voltage regulators, construction and working of LED and photodiode.

– Authors



Electrical Appliances

Dr. Ramana Pilla
Dr. G.T. Chandra Sekhar



SHREE PUBLISHING HOUSE

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jr., SRIKAKULAM

ELECTRICAL _____ _____**APPLIANCES**

Dr. Ramana Pilla

M.Tech, Ph.D, MISTE, MIE(I)

Professor

Department of Electrical & Electronics Engineering
GMR Institute of Technology
Rajam, AP, India.

Dr. G.T. Chandra Sekhar

M.Tech, Ph.D, MISTE, MIE(I)

Associate Professor

Department of Electrical & Electronics Engineering
Sri Sivani College of Engineering
Srikakulam, AP, India.



Visakhapatnam, Andhra Pradesh



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapatem Jn., SRIKAKULAM

Every effort been made to avoid errors or omissions in the publication. In spite of this, errors may have crept in. Any mistake/error or discrepancy noted may be brought to our notice, which shall be taken care of in the next edition.

All rights are reserved

No part of this publication, which is material protected by this copyright notice, may be reproduced, stored in a retrieval system, or transmitted in any form or by any means -electronic, digital or mechanical, including photocopying, scanning, recording or otherwise, without prior written permission of the publisher.

First Edition - 2021
Copyright © Publisher

ISBN: 978-81-651661-1-4

Price : Rs. 175.00

Shree Publishing House

Office:

Flat -23, Block No. 2 LIG-II, APHB Colony,
Kommadi, Madhurawada, Visakhapatnam-530048
Andhra Pradesh
Phone No- 9948250752, 9398778826
Email: shreepublishinghouse@gmail.com



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

PREFACE

This book is designed based on AICTE model curriculum for graduate students, those who study Electrical Appliances as one of the subject in their curriculum. The primary goal of this book is to establish a firm understanding of the basic knowledge of DC Fundamentals, AC Fundamentals, Measuring Instruments, Electrical Wiring & Protection, Fundamentals of Illumination and Domestic Electrical Appliances. The contents of this book are presented in a simple way for easy understanding of students and can be used as a self-study material. Multiple choice questions and review questions have been provided at the end of each chapter.

This book contains six chapters and organized as follows:

Chapter-1 deals with DC Fundamentals: It describes various terms related to electrical circuits, circuit parameters, formulation and solution of network equations using Kirchhoff's laws, electrical conductors and insulators.

Chapter-2 deals with AC circuits: It describes various wave forms including sinusoidal and other periodic for evaluation of RMS value, average value, form factor and peak factor. It also explains impedance/admittance parameters, power and power factor, single-phase and three-phase connections.

Chapter-3 deals with Measuring Instruments: It describes principle of operation and construction details of ammeter, voltmeter, galvanometer, multimeter, wattmeter, energy meter and transformer.

Chapter-4 deals with Electrical Wiring and Protection: It describes various wiring schemes, earthing schemes, fuses, circuit breakers, inverter and uninterruptible power supply (UPS). It also deals with electric shock along its first aid precautions.

Chapter-5 deals with Fundamentals of Illumination: It describes basic terminology used in illumination, laws of illumination, principles of light control and various sources of illumination

Chapter-6 deals with Domestic Electrical Appliances: It describes the construction and working of electric fan, electric iron box, water heater, induction heater, microwave oven, refrigerator and IS/IE codes.

– Authors


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jr., SRIKAKULAM

ABOUT THE AUTHORS



Dr. Karedla Chitambara Rao is an Associate Professor at Aditya Institute of Technology and Management (AITAM), Tekkali, Srikakulam, Andhra Pradesh, India where he has been teaching for the past 17 years. He received his B. Tech. in ECE, from JNTU, Hyderabad, M.Tech in VLSI Design from Sathyabama University, Chennai and Ph.D in ECE from Andhra University, Visakhapatnam. He has published/presented 26 papers in international and national journals/conferences of repute. He has also attended one international conference in Singapore. His research interest includes design of multi-band antennas and optimization of algorithms in VLSI Design. He was a life member of ISTE, IETE (India) and a member of several academic bodies.



Dr. Ramana Pilla is a Professor at GMR Institute of Technology, Rajam, Andhra Pradesh, India where he has been teaching for the past 20 years. He received his B.Tech. in EEE, M.Tech. in Electrical Power Engineering and Ph.D in EEE from JNTUH, Hyderabad. He was authored/co-authored 11 text books; out of which 6 text books from Schand Publications, 2 text books from Universities Press (India) Pvt. Ltd., 1 text book from Reem Publications Pvt. Ltd and 2 text books from Shree Publishing House. He has published/presented 55 papers in international and national journals/conferences of repute. His research interest includes state estimation and controller design for electrical drives, automatic generation control, application of soft computing techniques to electrical power systems. He was a life member of ISTE, IE (India) and member of several academic bodies.



Dr. G. T. Chandra Sekhar is Associate Professor at Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh, where he has been teaching for the past 12 years. He received his B.Tech. in EEE from JNTU, Hyderabad, M.Tech in Power Electronics & Electric Drives from JNTUK, Kakinada. He received Ph.D in Electrical Engineering from Veer Surendra Sai University of Technology, Burla, Odisha, India. He was authored/co-authored 5 text books; out of which 3 text books from Schand Publications and 2 text books from Shree Publishing House. He has published more than 45 research papers in various National/International Journals and International/ National Conferences of repute. He received Best Young Researcher in Electrical Engineering by ITS Foundation Award-2017. He also received Young Leader in Engineering during the Higher Education Leadership Meet-HELM 2018 organized by Venus International Foundation. His research interests include soft computing application in power system Engineering. He was a life member of ISTE, IE (India), IAENG, ISAET and associate member of IRED.



Office: Flat No. 23, Block No. 2,
LIG-II, APHB Colony, Kommadi,
Madhurawada, Visakhapatnam - 530 048
Andhra Pradesh
Ph : 9948250752, 9398778826
E-mail: shreepublishinghouse@gmail.com

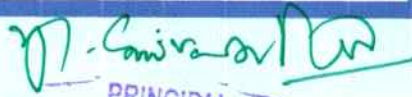
ISBN:978-93-91117-34-4



9 789391 117344



SHREE PUBLISHING HOUSE


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapatem Jn., SRIKAKULAM

DIGITAL ELECTRONICS

DIGITAL ELECTRONICS

Dr. K. Chitambara Rao
Dr. Ramana Pilla
Dr. G.T. Chandra Sekhar

Dr. K. Chitambara Rao
Dr. Ramana Pilla
Dr. G.T. Chandra Sekhar



Digital Electronics

Dr. K. Chitambara Rao

M.Tech, Ph.D., MISTE, MIE(I)

Associate Professor

Department of Electronics & Communication Engineering
Aditya Institute of Technology and Management
Tekkali, AP, India.

Dr. Ramana Pilla

M.Tech, Ph.D, MISTE, MIE(I)

Professor

Department of Electrical & Electronics Engineering
GMR Institute of Technology
Rajam, AP, India.

Dr. G.T. Chandra Sekhar

M.Tech, Ph.D, MISTE, MIE(I)

Associate Professor

Department of Electrical & Electronics Engineering
Sri Sivani College of Engineering
Srikakulam, AP, India.



Visakhapatnam, Andhra Pradesh



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Every effort been made to avoid errors or omissions in the publication. In spite of this, errors may have crept in. Any mistake/error or discrepancy noted may be brought to our notice, which shall be taken care of in the next edition.

All rights are reserved

No part of this publication, which is material protected by this copyright notice, may be reproduced, stored in a retrieval system, or transmitted in any form or by any means -electronic, digital or mechanical, including photocopying, scanning, recording or otherwise, without prior written permission of the publisher.


First Edition - 2021
Copyright © Publisher

ISBN: 978-93-91117-34-4

Price : Rs. 270.00

Shree Publishing House

Office:
Flat -23, Block No. 2 LIG-II, APHB Colony,
Kommadi, Madhurawada, Visakhapatnam-530048
Andhra Pradesh
Phone No- 9948250752, 9398778826
Email: shreepublishinghouse@gmail.com


PRINCIPAL

SRI SIVANI COLLEGE OF ENGINEERING
Chinakapalem Jn., SRIKAKULAM

PREFACE

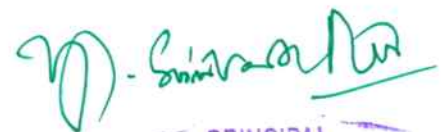
This book is designed based on the AICTE model curriculum for graduate students, those who study Digital Electronics as one of the core subjects in their curriculum. The primary goal of this book is to establish a firm understanding of the basic knowledge of Number Systems and Codes, Boolean Algebra and Theorems, Combinational Digital Circuits, Sequential Digital Circuits and Memory Devices. The contents of this book are presented in a simple way for easy understanding of students and can be used as a self-study material. Additional Solved Problems, Multiple Choice Questions and Review Questions have been provided at the end of each chapter.

This book contains five chapters and is organized as follows:

Chapter-1 deals with number systems and codes: Generally, the digital circuits used in digital systems are two-state circuits. Binary numbers are used in digital systems. Human beings can explain and understand data which are available in decimal form. Binary data can be represented briefly using the various Number Systems like octal, decimal and hexadecimal notations. For this reason, binary, octal, decimal, hexadecimal number system and conversion of numbers from one system to another are discussed. Apart from this, BCD, Gray code, Excess-3 code and arithmetic operations are discussed in chapter-1.

Chapter-2 deals with Boolean algebra and theorems: The logic designer has to know how to interconnect the logic gates to convert the input signals to the output signals. The relationship between the input and output signals can be described mathematically by using Boolean algebra. Chapter-2 introduces the basic laws and theorems, and such laws and theorems are used to minimize the switching functions. The simplification of complex logic functions cannot be performed by the algebraic methods. To simplify the complex logic functions, the systematic method like K-map method for two, three and four variables has been discussed in chapter-2.

Chapter-3 deals with combinational digital circuits: Several types of digital circuits used for processing and transmission of data, such as adders, subtractors, multiplexers, de-multiplexers, encoders, and decoders; which are discussed in Chapter-3. In addition to this, most of the gates are available in several logic families. The TTL, MOS and CMOS class of logic families are also discussed in chapter-3.



Chapter-4 deals with sequential digital circuits: The basic memory element used in the design of sequential circuits is called flip-flop. Various types of flip-flops and conversion of one flip-flop into another are discussed in Chapter-4. The flip-flops can be interconnected to make registers for data storage and shifting. Various types of shift registers are discussed in this chapter. The counters are very widely used digital circuits. The flip-flops are interconnected with gates to form counters. Design of asynchronous and synchronous counters are also discussed in chapter-4.

Chapter-5 deals with Memory devices: Logic design using programmable logic devices has got many advantages over fixed function IC's. Logic design using various programmable devices like ROM, PROM, EPROM, EEPROM, RAM, SRAM and DRAM are discussed in chapter-5.

– Authors



Multi-Objective Optimization for Enhanced Surface Roughness and Microhardness of AA 6063/ TiO_2 Cast Aluminium Metal Matrix Nanocomposites Fabricated by Friction Stir Processing

S. Laxmanaraju,¹ Lingaraju Dumpala,² and R. Pavankumar¹

¹Department of Mechanical Engineering, Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh, India.

²Department of Mechanical Engineering JNTUK, Kakinada, Andhra Pradesh, India.

³Department of Mechanical Engineering, Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh, India.

¹*laxman.raju@yahoo.co.in*, ²*dlraju@gmail.com*, ³*pavan5103@gmail.com*

ABSTRACT: In this chapter, friction stir processing (FSP) is used as an effective technique to improve the strength and hardness of various AA6063 aluminium alloys so as to alter the nanocomposite by using TiO_2 . This FSP process has also been used to impart superplasticity for eliminating casting defects. The FSP process parameters are tools with different rotation speeds of 1050, 1200, 1450 rpm; tool transverse feed of 30, 45, 60 mm/min; tool pin profile shapes of conical, rectangular, and threaded forms of the nano-reinforced particles that are strategically varied during the FSP process. The FSP experiments are conducted by using L9 Taguchi-based design of experiment to fabricate cast nanocomposite. Subsequently, the nanocomposites fabricated through FSP undergo few mechanical tests to evaluate mechanical metallurgical properties such as microhardness, tensile strength, and surface roughness. Multi-objective model using Grey relational analysis is proposed to solve the problem. Analysis of variance is used to determine the percentage of contribution of the given process parameters, and the tool rotation speed is high influenced parameter,



31

Chapter 5

Impact of IoT in Healthcare: Improvements and Challenges



H. Swapna Rekha, Janmenjoy Nayak, G. T. Chandra Sekhar,
and Danilo Pelusi

1 Introduction

In the modern era of communication technology, the internet is one of the most powerful tools throughout the world. As the internet and the World Wide Web have grown to link all signs of intelligence, the idea and practice of connecting everything fructified as the Internet of Things (IoT). In 1999, the term IoT was coined by Kevin Ashton during his work on supply chain management domain (Ashton 2009). At present, there are many definitions of IoT, which may vary based on the context and perspectives of those defined it. IoT may be defined as the “integration of sensors and actuators embedded in physical objects that are capable of establishing communication between devices without human interference” (Ambrosin et al. 2016). The basic foundation of IoT is machine-to-machine communication where two or more devices communicate with each other through radio-frequency identification (RFID) and sensor networks (Da Xu et al. 2014; Bi et al. 2014; Zhong et al. 2011). Even though IoT has survived for more than a decade, the rapid development of electronic devices such as wireless connectivity and mobile devices is the basic reason for the rise of this technology. Further, the growth of the digital economy and knowledge-based capital has also played a key role in the rapid development of this technology. The objective of IoT is to provide a global network-assisting universal computing and context awareness among devices, which are primary requisites of ambient intelligence. The enormous usage of IoT offers benefits such as technical optimization,

H. S. Rekha · J. Nayak (✉)

Department of CSE, Aditya Institute of Technology and Management, Tekkali, Srikakulam, India
e-mail: mailforjnayak@gmail.com

G. T. C. Sekhar

Department of EEE, Sri Sivani College of Engineering, Srikakulam, India

D. Pelusi

Faculty of Communication Sciences, University of Teramo, Coste Sant'Agostino Campus,
Teramo, Italy

© Springer Nature Singapore Pte Ltd. 2020

K. Das et al. (eds.), *The Digitalization Conundrum in India*, India Studies
in Business and Economics, https://doi.org/10.1007/978-981-15-6907-4_5

73


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapatem Jn., SRIKAKULAM



Empirical Analysis of Absenteeism at Work Place Using Machine Learning

Dabbeeru Priyanka and Janmenjoy Nayak^(✉)

Department of Computer Science and Engineering,
Sri Sivani College of Engineering, Srikakulam, AP 532410, India
dabbeerupriyanka90@gmail.com, mailforjnyak@gmail.com

Abstract. Absenteeism infers either progressing evasion of work, or wilful absent as in a strike action. It excludes programmed or accidental nonappearances. It is a result of considerable causes, or clarifications for one's control, for instance, accidents, infirmity, etc. While certain number of representatives misses more number of working days, it leads inordinate unlucky deficiencies at that point and there will be diminished profitability just as real impact on organization systems, accounts, confidence and different variables. The primary focal point of this undertaking is to break down and foreseeing psychological factors of absenteeism at work spot by utilizing grouping algorithms such as K-Nearest Neighbor, Decision Tree, Random Forest, SVM and Neural Network.

Keywords: Absenteeism · KNN · Decision tree · Random forest · SVM and neural network · Machine learning

1 Introduction

Absenteeism is particularly a troublesome issue to deal with, in light of the fact that there will be both affirmed just as sorry excuses for the missing work. Present days, it is a moving issue to everybody to conquer it and to successfully monitor, control and diminish the non-appearance. Absenteeism at workplace is major area of concern. The word "absenteeism" is derived from a Latin word called "absentia". There is no perfect visibility for absenteeism and it helps in defining the non attendance of the employees to their own work [1]. Traditionally, it is considered as a problem of human resource management at wide range of IT sectors and organization [2]. It leads to the inactivity of the workers at workplaces [3]. Absenteeism at workplace majorly resulted in the workplace incivility. Workplace incivility means unacceptable performance or behavior at workplace and not following workplace principles [4]. The behavior and psychosocial factors of absenteeism at workplace can be predicted and examined by the management scientists and the social psychologists.

Now-a-days, various soft computing techniques are used to examine the behavior and psychosocial factors of absenteeism at work place. In this paper, various soft computing techniques such as K-NN, decision tree, SVM, random forest and neural network are used. The decision tree contains the three sections in particular root node, branches and leaf nodes. It resembles an information structure, where every single interior node represents to the trial of a specific trait. Branch node will represent to the



Soft Computing in Robotics: A Decade Perspective

H. Swapna Rekha¹, Janmenjoy Nayak^{1(✉)}, Bighnaraj Naik²,
and Danilo Pelusi³

¹ Department of Computer Science and Engineering,
Sri Sivani College of Engineering, Srikakulam 532410, India
swapnarekha23@gmail.com, mailforjnyayak@gmail.com

² Department of Computer Application,
Veer Surendra Sai University of Technology, Burla, Odisha, India
mailtobnaik@gmail.com

³ Faculty of Communication Sciences, University of Teramo,
Coste Sant'Agostino Campus, Teramo, Italy
dpelusi@unite.it

Abstract. As soft computing deals with development of approximate models in finding solutions to real world problems, it is considered as one of the emerging area of research in all fields of engineering and sciences. Because of rapid development in mechanization, vast research has also been carried out by the researchers in the field of robotics for the development of robots in various applications such as industry, medical, rehabilitation, agriculture, military etc. to assist human being. In this paper, a comprehensive analytical perspective of soft computing techniques and their application in robotics has been illustrated. Further, the analysis is a witness of the fact that problems emerging in the robotics can be solved aptly using soft computing techniques. Also, this paper sheds light on various issues and challenges of the discussed research area to demonstrate the dominance of soft computing techniques in the development of various applications in robotics.

Keywords: Soft computing · Robotics · Swarm intelligence · Neural network

1 Introduction

Since last few decades, there has been a trend of extensive development in industry and technology. In earlier days, computational models have been absolutely used to evaluate comparatively simple systems. Due to the emerging advancement in technology, more complex problems have been originating in the areas of biology, management sciences, medical science, weather forecasting and so on. The main problem with conventional system is complex problems are not precisely depicted using mathematical and analytical tools. Therefore, it becomes difficult to control complex problems using conventional mathematical methods. In today's era, soft computing became the latest buzz word, as it deals with approximate models in solving NP-complete and real world complex problems. Even though, in 1980s soft computing techniques were

Applications and Advancements of Nature-Inspired Optimization Algorithms in Data Clustering: A Detailed Analysis



Janmenjoy Nayak, Paidi Dinesh, Kanithi Vakula, Bighnaraj Naik and Danilo Pelusi

Abstract In the last decade, nature-inspired optimization algorithm has been a keen interest among the researchers of optimization community. Most of nature-inspired algorithms are developed through the simulating behavior of natural agents in nature. In comparison with evolutionary- and swarm-based algorithms, these are most effective techniques for all real-life applications. Although both swarm- and evolutionary-based algorithms are one of the subsets of nature-inspired optimization algorithm but the efficiency and effectiveness of such algorithm make them more attractive to use in various data mining problems. Among the other tasks of data mining, it has been always a challenging task to solve clustering problem, which is unsupervised in nature. In this paper, a brief study has been conducted on the applications of nature-inspired optimization algorithms in clustering techniques. Also, few challenging issues along with the advancements of various nature-inspired optimization algorithms are realized in the field of clustering.

Keywords Nature-inspired optimization algorithms · Particle swarm optimization algorithm · Evolutionary algorithms · Clustering · Data mining

J. Nayak · P. Dinesh · K. Vakula
Department of Computer Science and Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: mailforjnyak@gmail.com

P. Dinesh
e-mail: dinesh.pydi98@gmail.com

K. Vakula
e-mail: vakku.bi@gmail.com

B. Naik (✉)
Department of Computer Application, Veer Surendra Sai University of Technology, Burla,
Sambalpur 768018, Odisha, India
e-mail: mailtobnaik@gmail.com

D. Pelusi
Faculty of Communication Sciences, University of Teramo, Coste Sant'Agostino Campus,
Teramo, Italy
e-mail: dpelusi@unite.it

© Springer Nature Singapore Pte Ltd. 2020
H. S. Behera et al. (eds.), *Computational Intelligence in Data Mining*, Advances in Intelligent Systems and Computing 990,
https://doi.org/10.1007/978-981-13-8676-3_62

731

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM



Significance of Particle Swarm Optimization in Intrusion Detection: Crossing a Decade

Janmenjoy Nayak¹, Kanithi Vakula¹, Paidi Dinesh¹,
and Bighnaraj Naik^{2(✉)}

¹ Department of Computer Science and Engineering,
Sri Sivani College of Engineering, Srikakulam 532410, AP, India
mailforjnyak@gmail.com, vakku.bi@gmail.com,
dinesh.pydi98@gmail.com

² Department of Computer Applications,
Veer Surendra Sai University of Technology,
Burla, Sambalpur 768018, Odisha, India
mailto:bnaik@gmail.com

Abstract. Many nature inspired optimization algorithms have been developed since from the past decades and become popular due to its efficacy for solving various difficult problems of different areas of research. Particle swarm optimization algorithm (PSO) is famous, yet efficient nature inspired swarm intelligence based metaheuristic algorithm. Since from its initiation, PSO has become popular among the researchers due to its capability and became interest topic for the researchers as well as practitioners for solving the problems of several domains of research such as robotics, cloud computing, cyber security as well as other security domains. However more than a decade, there has been an excellent track record of PSO in solving intrusion detection problems. Profuse difficulties have been solved with the help of PSO and its variants. Taking these facts into consideration, in this paper, we made a first ever in depth analysis on the applications, enhancements as well as usage levels of PSO in intrusion detection problems. The motive behind this research work is to inspire the researchers to enhance and innovate novel solutions for complex security problems of intrusion detection using PSO.

Keywords: PSO · Swarm intelligence · Intrusion detection system · Nature inspired algorithm

1 Introduction

Combination of best solution amidst of existing solution in order to determine a problem is known as optimization. Optimization is a significant tool in decision-making and in evaluating physical systems. It is playing a vital role in several applications such as engineering designs as well as business activities. A number of problems in assorted fields are mapped as problems of optimization and are fixed by utilizing different optimization algorithms. Nature is known to be most important source of inspiration and that's why most of the researchers have been motivated by the nature in the real world application. Over a decade, most newly projected algorithms are nature inspired algorithms and the leading portion of all these nature inspired

© Springer Nature Switzerland AG 2020
J. Nayak et al. (Eds.): ARIAM 2019, LAIS 5, pp. 187–202, 2020.
https://doi.org/10.1007/978-3-030-30271-9_18

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem, Jn., SRIKAKULAM

Golf-Worm Swarm Optimized 2DOF-PIDN Controller for Frequency Regulation of Hybrid Power System



Tulasichandra Sekhar Gorripotu and Ramana Pilla

Abstract This paper shows the impact of two degree of freedom PID controller with derivative filter (2DOF-PIDN) on frequency regulation of a hybrid power system. The 2DOF-PIDN controller gains values are optimized using glow-worm swarm optimization (GSO) by employing integral time multiplied absolute error (ITAE). The designed hybrid power system in MATLAB/Simulink environment consists of all possible distributed generating units in area-1 and thermal-hydro units in area-2. The pre-eminence of 2DOF-PIDN controller is explored by comparing with ID and PID controllers of same power system.

Keywords Frequency regulation · Glow-worm swarm optimization · Hybrid power system · 2DOF-PIDN controller

1 Introduction

In an electrically interconnected power system, automatic generation control (AGC) is used for retaining practically unvarying frequency, controlling the tie-line transaction schedule and distributing the load among the available generators. The active power depends on frequency and is controlled by the speed which is guarded by the speed governor. The permitted limit of frequency deviation is $\pm 0.5\%$. The reactive power depends up on voltage which depends on excitation and is controlled by excitation control. The allowable limit of voltage is $\pm 0.5\%$. The frequency control is as important as voltage control. One has to keep in mind that always the output power of the alternator set at any point of instant should be equal with the load demanded. But, in practical, it is very difficult to achieve [1, 2].

T. S. Gorripotu (✉)

Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: gtchsekhar@sisivani.com; gtchsekhar@gmail.com

R. Pilla

Department of Electrical and Electronics Engineering, GMR Institute of Technology, Rajam,
Srikakulam 532127, Andhra Pradesh, India
e-mail: ramana.pilla@gmrit.edu.in; pramana.gmrit@gmail.com

© Springer Nature Singapore Pte Ltd. 2020

A. K. Das et al. (eds.), *Computational Intelligence in Pattern Recognition*,
Advances in Intelligent Systems and Computing 1120,
https://doi.org/10.1007/978-981-15-2449-3_50

589

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM



Fuzzy PID Controller for Automatic Generation Control of Interconnected Power System Tuned by Glow-Worm Swarm Optimization

Ramana Pilla¹, Nirupama Botcha²,
Tulasichandra Sekhar Gorripotu²✉, and Ahmad Taher Azar^{3,4}

¹ Department of Electrical and Electronics Engineering, GMR Institute of Technology, Rajam, Srikakulam 532127, Andhra Pradesh, India
ramana.pilla@gmrit.edu.in

² Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering, Srikakulam 532402, Andhra Pradesh, India
neerupamab@gmail.com, gtchsekhar@gmail.com

³ College of Engineering,
Prince Sultan University, Riyadh, Kingdom of Saudi Arabia
ahmad.azar@fci.bu.edu.eg

⁴ Faculty of Computers and Artificial Intelligence,
Benha University, Benha, Egypt

Abstract. In this article Fuzzy-Proportional Integral Derivative controller (Fuzzy-PID) is proposed for Automatic Generation Control (AGC) problem of multi area thermal hydropower system. At the outset, a two area hydro thermal power system is developed in the MATLAB/SIMULINK environment. Non-linearities like backlash, transport delay (TD) and generation rate constraint (GRC) are incorporated at the suitable positions in the system and fuzzy-PID controllers are kept as a secondary controller to diminish AGC problem. The superiority of fuzzy-PID controller is explored by comparing with integral, proportional integral (PI) and PID controllers. The controller parameters have been tuned with Glow-worm Swarm Optimization (GSO) algorithm and the Integral Time Absolute Error (ITAE) is used as an objective function. The results are verified through simulations and experiments. The optimized fuzzy-PID controller shows good closed-loop responses in control multi area thermal hydropower system.

Keywords: Automatic Generation Control (AGC) · Fuzzy-PID · Glow-worm Swarm Optimization (GSO) · Integral Time Absolute Error (ITAE)

1 Introduction

In modern days, sending quality of power to the customers is a big task. The power system having lots of generators and connected loads. Nowadays, power system has two problems, those are real power mismatch and reactive power mismatch. The mismatch in real power delivery among generators and loads causes frequency

© Springer Nature Switzerland AG 2020
J. Nayak et al. (Eds.): ARIAM 2019, LAIS 5, pp. 140–149, 2020.
https://doi.org/10.1007/978-3-030-30271-9_14

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jr., SRIKAKULAM

Sine Cosine Optimization Based Proportional Derivative-Proportional Integral Derivative Controller for Frequency Control of Hybrid Power System



Tulasichandra Sekhar Gorripotu, Pilla Ramana, Rabindra Kumar Sahu and Sidhartha Panda

Abstract This work introduces Sine Cosine Algorithm (SCA) for a hybrid power system and it is employed with one of a cascade controller called proportional derivative-proportional integral derivative controller (PD-PID) to maintain frequency regulation. The proposed hybrid power system comprises of thermal unit, wind turbine generators (WTGs), aqua electrolyze (AE), fuel cell (FC), diesel engine generator (DEG), battery energy storage (BES) system, ultracapacitor (UC) in area-1 and in area-2 the combination of hydro-thermal units are considered. The system is analyzed under different cases: step load disturbance in both the areas, band limited noise in both the areas and step disturbance with noise at the wind system. The supremacy of the proposed controller is analyzed with PIDF controller on the same platform.

Keywords Band limited noise · Frequency regulation · Hybrid power system · PD-PID · SCA

T. S. Gorripotu (✉)
Department of Electrical and Electronics Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: gtchsekhar@gmail.com

P. Ramana
Department of Electrical and Electronics Engineering, GMR Institute of Technology,
Rajam 532127, Andhra Pradesh, India
e-mail: pramana.gmr@gmail.com; ramana.pilla@gmr.edu.in

R. K. Sahu · S. Panda
Department of Electrical Engineering, Veer Surendra Sai University of Technology (VSSUT),
Burla 768018, Odisha, India
e-mail: rksahu123@gmail.com

S. Panda
e-mail: panda_sidhartha@rediffmail.com

© Springer Nature Singapore Pte Ltd. 2020
H. S. Behera et al. (eds.), *Computational Intelligence in Data Mining*, Advances in Intelligent Systems and Computing 990,
https://doi.org/10.1007/978-981-13-8676-3_66

789

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jnr., SRIKAKULAM

Multi-objective Optimization of Submerged Friction Stir Welding Process Parameters for Improved Mechanical Strength of AA6061 Weld Bead by Using Taguchi-L18-Based Gray Relational Analysis



Laxmana Raju Salavaravu and Lingaraju Dumpala

Abstract Submerged friction stir welding (SFSW) is a moderation tool in the manufacturing industry. SFSW is used to join the AA6061-T6 plates in the seawater environment to different processes of parameters that are tool rotation speed, feed rate, and tilt angle. The experiments are done by using optimization method. To obtain a single optimum combination of parameters for these two types of responses, gray relational analysis has been utilized. Gray relational grade and a single optimum setting have been acquired for the SFSW of AA6061-T6. One of the most affecting and influencing processes of parameter is to find by applying ANOVA and the maximum orderly tool rotational speed is 61.63%, tool feed rate is 17.95% and finally, tool tilt angle is 12.47% of contribution in the entire process.

Keywords Submerged friction stir welding (SFSW) · Taguchi's method · Gray relational analysis (GRA) · Ultimate tensile strength (UTS) · Micro hardness (HV)

1 Introduction


FSW is a moderate technique developed by TWI Cambridge for joining of aluminum alloys. This process is widely used in so many industries such as aircraft, aerospace, automobile, naval. FSW joints with high strength, low weld defects, low distortion, and low cost are the main advantages of this method. FSW is comprised of a non-consumable specially designed rotating tool is inserted into the edges of the two plates heating the workpiece by the friction between tool and workpiece the tool transverse along the line of joint the material flows from advancing side to retreating

L. R. Salavaravu
Mechanical Engineering Department, Sri Sivani College of Engineering,
Chilakapalem, Andhra Pradesh 532402, India

L. Dumpala (✉)
Mechanical Engineering Department, JNTUK UCEK, Kakinada,
Andhra Pradesh 533003, India

© Springer Nature Singapore Pte Ltd. 2020
H. K. Voruganti et al. (eds.), *Advances in Applied Mechanical Engineering*,
Lecture Notes in Mechanical Engineering,
https://doi.org/10.1007/978-981-15-1201-8_103

965


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jr., SRIKAKULAM

Influence of Double Elliptical Leaf Angle with Same Orientation and Direction to Evaluate Thermal Performance in Double Pipe Heat Exchanger



J. Bala Bhaskara Rao, B. Murali Krishna and K. Narendra

Abstract Double pipe heat exchanger is an apparatus utilized to transfer the energy between two liquids. To attain high performance of heat transfer rate in small-area passive methods are castoff. The heat transfer rate along the length of the heat exchanger is intended at different mass flow rates of water by experimentally and numerically. FLUENT analysis is conducted with different strips. In this FLUENT analysis, strip having two elliptical leafs at a distance of 50 mm along the length, the major and minor axes are in 2:1 with 1 mm thickness at altered angles between 0° and 180° at 10° intervals are arranged. These two elliptical leaves are having same orientation and same direction toward the length of the strip. Water is taken as a liquid at various turbulent regions in between 5000 and 20,000. From numerical results, increased rate of heat transfer rates is achieved with strip with elliptical leaves having 60° inclinations because of more turbulence and secondary flows are acquired.

Keywords Heat transfer · Pressure drop · Elliptical strip · Reynolds number · Leaf angle

1 Introduction

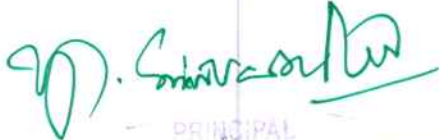
Heat exchangers are mostly utilized to transfer the energy between two different temperature fluids. These are mainly used in all process industries like chemical plants, power plants, etc. By using theoretical and practical analysis with simulations, the performance of the double pipe heat exchanger is studied and optimized the tube diameter [1, 2]. The heat transfer coefficient of the inner tube flow (circular cross section) is calculated using the standard correlations, and an attempt is made to enhance the rate of heat transfer in heat exchangers using Al_2O_3 nanofluid [3, 4].

J. Bala Bhaskara Rao (✉) · B. Murali Krishna
Department of Mechanical Engineering, SSCE, Kakinada, India

K. Narendra
Department of Mechanical Engineering, SISTAM, Srikakulam, India

© Springer Nature Singapore Pte Ltd. 2020
BBVL. Deepak et al. (eds.), *Innovative Product Design and Intelligent Manufacturing Systems*, Lecture Notes in Mechanical Engineering,
https://doi.org/10.1007/978-981-15-2696-1_45

457


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Applications of Computational Intelligence Techniques for Automatic Generation Control Problem—A Short Review from 2010 to 2018



Tulasichandra Sekhar Gorripotu, Simma Gopi, Halini Samalla,
A. V. L. Prasanna and B. Samira

Abstract This work provides a brief review report on applications of computational intelligence techniques for automatic generation control (AGC) problem. Various optimization techniques employed to the conventional multi-area power system and restructured power system are highlighted. With that, the review also highlights the types of controllers used for various types of systems.

Keywords AGC · Controllers · Intelligence techniques · Restructured power system

1 Introduction

The present day, power system is expanding day by day due to the expansion of power generation, development in renewable energy generation, and changing in time to time load variation. The motto of the power system engineers is to generate, transmit, and distribute the quality electric power to the consumers without any disturbances. When the generation is equal to the load demand plus losses of the system then it said to be stable system. But, due to lack of long-term planning and increase in load demand the system becomes unstable and the frequency and voltage

T. S. Gorripotu (✉) · S. Gopi · H. Samalla · A. V. L. Prasanna · B. Samira
Department of Electrical & Electronics Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: gtchsekhar@gmail.com

S. Gopi
e-mail: simmagopi53@gmail.com

H. Samalla
e-mail: halini.samalla@gmail.com

A. V. L. Prasanna
e-mail: avlprasanna23@gmail.com

B. Samira
e-mail: ssameera.barla@gmail.com

© Springer Nature Singapore Pte Ltd. 2020
A. K. Das et al. (eds.), *Computational Intelligence in Pattern Recognition*,
Advances in Intelligent Systems and Computing 999,
https://doi.org/10.1007/978-981-13-9042-5_48

563

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem, Jn., SRIKAKULAM

A Survey on Teaching–Learning-Based Optimization Algorithm: Short Journey from 2011 to 2017

Janmenjoy Nayak, Bighnaraj Naik, G. T. Chandrasekhar
and H. S. Behera

Abstract Since the early days of optimization, basically there are two famous optimization methods such as evolutionary-based and swarm intelligence-based algorithms. These two algorithms are population-based metaheuristics and are used to solve many of the real-world complex computing problems. However, recent research of some of the multi-objective optimization algorithms reveals that those earlier developed metaheuristics are unable to solve the multi-dimensional problems due to their pitfalls such as adjustment of controlling parameters, probabilistic nature, own algorithmic-dependent parameters. Looking into such scenario, in 2011 a new population-based metaheuristic was developed by R.V. Rao called teaching–learning-based optimization (TLBO) algorithm. Since its inception, the applicability of TLBO has crossed many milestones as compared to other recently developed metaheuristics for its use in diversified problem domains of engineering. In this paper, a survey is conducted on TLBO and its variants along with the discussion on its range of applications from 2011 to 2017.

Keywords Teaching–learning-based algorithm • Population-based algorithm

J. Nayak (✉)

Department of Computer Science and Engineering, Sri Sivani College of Engineering (SSCE), Srikakulam 532410, Andhra Pradesh, India
e-mail: mailforjnyak@gmail.com

B. Naik

Department of Computer Application, Veer Surendra Sai University of Technology, Burla 768018, Odisha, India
e-mail: mailtoznaik@gmail.com

G. T. Chandrasekhar

Department of EEE, Sri Sivani College of Engineering, Srikakulam 532410, Andhra Pradesh, India
e-mail: gtchsekhar@gmail.com

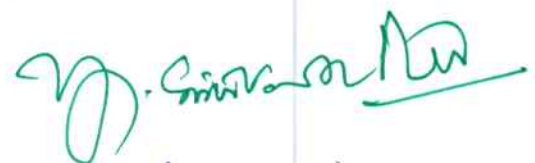
H. S. Behera

Department of IT, Veer Surendra Sai University of Technology, Burla 768018, Odisha, India
e-mail: mailtohsbehera@gmail.com

© Springer Nature Singapore Pte Ltd. 2019

H. S. Behera et al. (eds.), *Computational Intelligence in Data Mining*, Advances in Intelligent Systems and Computing 711, https://doi.org/10.1007/978-981-10-8055-5_66

739



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

KIDNEY-INSPIRED ALGORITHM AND FUZZY CLUSTERING FOR BIOMEDICAL DATA ANALYSIS

11

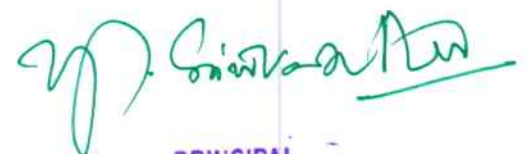
Janmenjoy Nayak*, Kanithi Vakula*, Pandit Byomakesha Dash[†], Bighnaraj Naik[†]

*Department of Computer Science and Engineering, Sri Sivani College of Engineering, Srikakulam, India** *Department of Computer Application, Veer Surendra Sai University of Technology, Burla, India[†]*

11.1 INTRODUCTION

Optimization is generally a numerical problem found in all engineering regulations as well as various other fields of data mining. Precisely, optimization means finding the finest desirable solution to a problem. Problems of optimization are various and abundant. Therefore, techniques for resolving these problems were necessary. Previous techniques to resolve optimization problems necessitate vast computational endeavors, which tend to be unsuccessful as the problem range rises. This is the inspiration for utilizing bio-inspired optimization algorithms [1–23] as computationally well-organized alternatives to deterministic advances. The real attractiveness of nature-inspired algorithms lies in the fact that it gets their solitary stimulation from nature. Nowadays, researchers are paying more attention to nature-inspired optimization algorithms as these are proficient in resolving difficult problems such as constrained as well as unconstrained type problems. In these modern times, the researchers are attempting to replicate nature in expertise due to the fact that nature is known to be the greatest instructor for technology. Nature-inspired optimization algorithms are procured from the behavior of physical or biological processes in the natural world.

A new era known as *bio inspired* in computing encircles a broad range of applications by covering nearly all areas including security, computer networks, robotics, control systems, data mining, production engineering, biomedical engineering, and many more. Bio Inspired algorithms (BIAs) duplicate or mimic the approach of nature from the time when many biological procedures were thought of as procedures of controlled optimization. Inventing a plan for bio inspired algorithms engages selecting an appropriate illustration of difficulty, estimating the solution using a robustness function, and defining operators so as to fabricate a novel set of clarifications. An enormous collection of literature exists on bio inspired advances for resolving an inspiring collection of tribulations. Moreover, many new studies have commented on the achievement of methods for explaining tricky problems in all the main fields of computer science. The two most primary and victorious instructions in BIAs involve swarm-based and evolutionary algorithms, which are stimulated by the natural development and communal behavior in animals correspondingly. From the previous few decades, the rise in difficulty of real-life problems has increased the need of enhanced metaheuristic techniques. A metaheuristic is an upper rank heuristic



A Comprehensive Review and Performance Analysis of Firefly Algorithm for Artificial Neural Networks



Janmenjoy Nayak, Bighnaraj Naik, Danilo Pelusi and A. Vamsi Krishna

Abstract After the successful (yet continuing) era of both evolutionary and swarm based optimization algorithm, a new class of optimizations such as nature inspired optimization algorithms came into limelight. Although swarm intelligence based algorithms are a subset of nature inspired methods, but some methods are purely based on nature and its phenomenon. However, one of a leading swarm based algorithm is firefly optimization and has been a keen interest for solving many real world complex problems. In this chapter, focus has been attended for various applications of integrated firefly algorithm with neural network. Also, it is true that the research area of neural network is quite diversified and too vast. Since its inception, firefly algorithm has been efficiently used in neural network research to solve diversified applications. This chapter provides the detailed study about the applications and further, it discusses some of the major future challenges.

Keywords Firefly algorithm · Neural network · Higher order neural network · Swarm optimization · Nature inspired algorithm

J. Nayak · A. V. Krishna
Department of Computer Science Engineering, Sri Sivani College of Engineering, Srikakulam,
AP 532410, India
e-mail: mailforjnyak@gmail.com


A. V. Krishna
e-mail: sendforvamsi@gmail.com

B. Naik (✉)
Department of Computer Application, Veer Surendra Sai University of Technology, Burla,
Sambalpur 768018, Odisha, India
e-mail: mailtobnaik@gmail.com

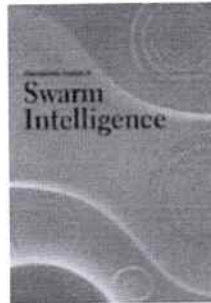
D. Pelusi
Faculty of Communication Sciences, University of Teramo, Coste Sant'Agostino Campus,
Teramo, Italy
e-mail: dpelusi@unite.it

© Springer Nature Switzerland AG 2020
X-S. Yang and X-S. He (eds.), *Nature-Inspired Computation in Data Mining
and Machine Learning*, Studies in Computational Intelligence 855,
https://doi.org/10.1007/978-3-030-28553-1_7

137


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Call for Papers



Int. J. of Swarm Intelligence

Special Issue on: "Soft Computing Techniques for Engineering Applications"

Guest Editors:

Dr. Janmenjoy Nayak, Dr. G. T. Chandrasekhar, Sri Sivani College of Engineering, India first guest editor
Dr. Bighnaraj Naik, Dr. H.S. Behera, Veer Surendra Sai University of Technology (VSSUT), India
Dr. Danilo Pelusi, University of Teramo, Italy

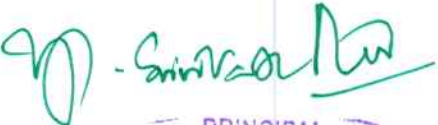
The modern era of advanced computing is still striving to develop consciousness-based machines. The methods used are quite close to the reasoning processes of humans. The insidious use of soft computing (SC) in diversified engineering applications makes it an essential tool in the development of products that have implications for human society. The term 'soft computing' refers to many useful techniques such as fuzzy logic, neural computing, probabilistic reasoning, evolutionary computation, etc. In recent years soft computing has been extended through the addition of many sub-disciplines, and it has become quite obvious that it is being frequently used in various engineering domains. In areas ranging from computer science engineering to other engineering domains such as electrical, civil, mechanical, etc., soft computing has become one of the premier choices for all researchers for solving complex and uncertain problems.

The main objective of this special issue is to cover both the theory and applications of various soft computing techniques embedded in diversified spanning fields of engineering and its subfields. It aims to provide an intellectual forum for researchers in academia and scientists and engineers from a wide range of application areas to present their latest research findings in soft computing techniques and identify future challenges in this novel combination of research areas.

Subject Coverage

Suitable topics include, but are not limited, to the following:

- Soft computing in knowledge discovery and data mining
- Soft computing in bioinformatics, computational biology, health and medical analytics
- Soft computing in power systems and energy
- Soft computing in machine learning and deep learning
- Soft computing in intelligent system modelling, design and computing
- Soft computing in big data
- Soft computing in pattern recognition
- Soft computing-based system identification
- Soft computing in engineering and design problems
- Soft computing in construction and transportation problems


— PRINCIPAL —
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Notes for Prospective Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. (N.B. Conference papers may only be submitted if the paper has been completely re-written and if appropriate written permissions have been obtained from any copyright holders of the original paper).

All papers are refereed through a peer review process.

All papers **must** be submitted online. To submit a paper, please read our [Submitting articles](#) page.

If you have any queries concerning this special issue, please email the Guest Editors at:

Dr. Janmenjoy Nayak: mailforinayak@gmail.com

Dr. G.T. Chandrasekhar: gtchsekhar@gmail.com

Dr. Bighnaraj Naik: mailtoznaik@gmail.com

Dr. H.S. Behera: hsbehera_india@yahoo.com

Dr. D. Pelusi: dpelusi@unite.it

Important Dates

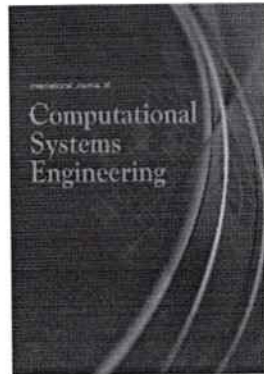
Manuscripts due by: *15 August, 2018*

Notification to authors: *15 October, 2018*

Final versions due by: *15 December, 2018*



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM



International Journal of Computational Systems Engineering

SCDA 2018: Call for Papers for Special Issue on: “Advances and Challenges of Soft Computing in Data Mining”

Guest Editors

Dr. Janmenjoy Nayak and Dr. G.T. Chandrasekhar, Sri Sivani College of Engineering, India
Dr. Bighnaraj Naik, Veer Surendra Sai University of Technology, India
Dr. Asit Kumar Das, Indian Institute of Engineering Science and Technology, India
Dr. Danilo Pelusi, University of Teramo, Italy

Data mining is one of the most revolutionary developments towards the automatic discovery of knowledge from data by applying advanced intelligent techniques to aid and improve complex decision making processes. Such approaches are helpful for enterprise governance and business intelligence, and within several application domains including marketing, logistic, accounting, finance, services and public administration, along with the scientific disciplines.

Soft computing is a broad area comprising a variety of techniques including fuzzy logic, neural computation, evolutionary computation, support vector machines, metaheuristic and swarm intelligence, probabilistic reasoning and many more. Although some of the above techniques are still in their embryonic stages, other techniques such as neural computation, evolutionary computation, fuzzy logic, metaheuristic and swarm intelligence, etc. have been of keen interest to many researchers around the globe. These techniques are increasingly being widely applied to a variety of data mining problems, ranging from practical applications in industry and commerce to cutting-edge scientific research. It is an emerging interdisciplinary area in which a range of techniques and methods are studied for dealing with large, complex and dynamic problems.

The main objective of this special issue is to cover both advancements and challenges of various soft computing techniques embedded into diverse fields of data mining such as classification, prediction, clustering, approximation, forecasting, etc. It aims to provide an intellectual forum for researchers in academia and scientists and engineers from a wide range of application areas to present their latest research findings in nature-inspired algorithms, and to identify future challenges in this novel combination of research areas.

The issue will carry revised and substantially extended versions of selected papers presented at the International Conference on Soft Computing in Data Analytics (SCDA 2018), but we are also inviting other experts to submit articles for this call.

Subject Coverage

Topics include, but are not limited to, the following:


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

- Classification
- Clustering
- Approximation
- Forecasting
- Swarm intelligence methods
- Artificial immune systems
- Knowledge discovery and data mining
- Evolutionary computation
- Machine learning techniques
- Learning classifier systems
- Fuzzy computation
- Applications of soft computing techniques
- Intelligent algorithms
- Bio-inspired computation

Notes for Prospective Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. (N.B. Conference papers may only be submitted if the paper has been completely re-written and if appropriate written permissions have been obtained from any copyright holders of the original paper).

All papers are refereed through a peer review process.

All papers must be submitted online. Please read our [Submitting articles](#) page.

If you have any queries concerning this special issue, please email the Guest Editors:

Dr. Janmenjoy Nayak: mailforinayak@gmail.com

Dr. G.T. Chandrasekhar: gtchsekar@gmail.com

Dr. Bighnaraj Naik: bnaik@gmail.com

Dr. Asit Kumar Das: akdas@cs.iiests.ac.in

Dr. D. Pelusi: dpelusi@unite.it

Important Dates

Manuscripts due by: *15 June, 2018*

Notification to authors: *15 August, 2018*

Final versions due by: *15 October, 2018*



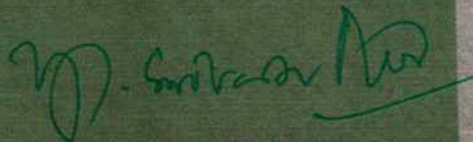
PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Basic Electrical Engineering

For the Students of JNTU HYDERABAD

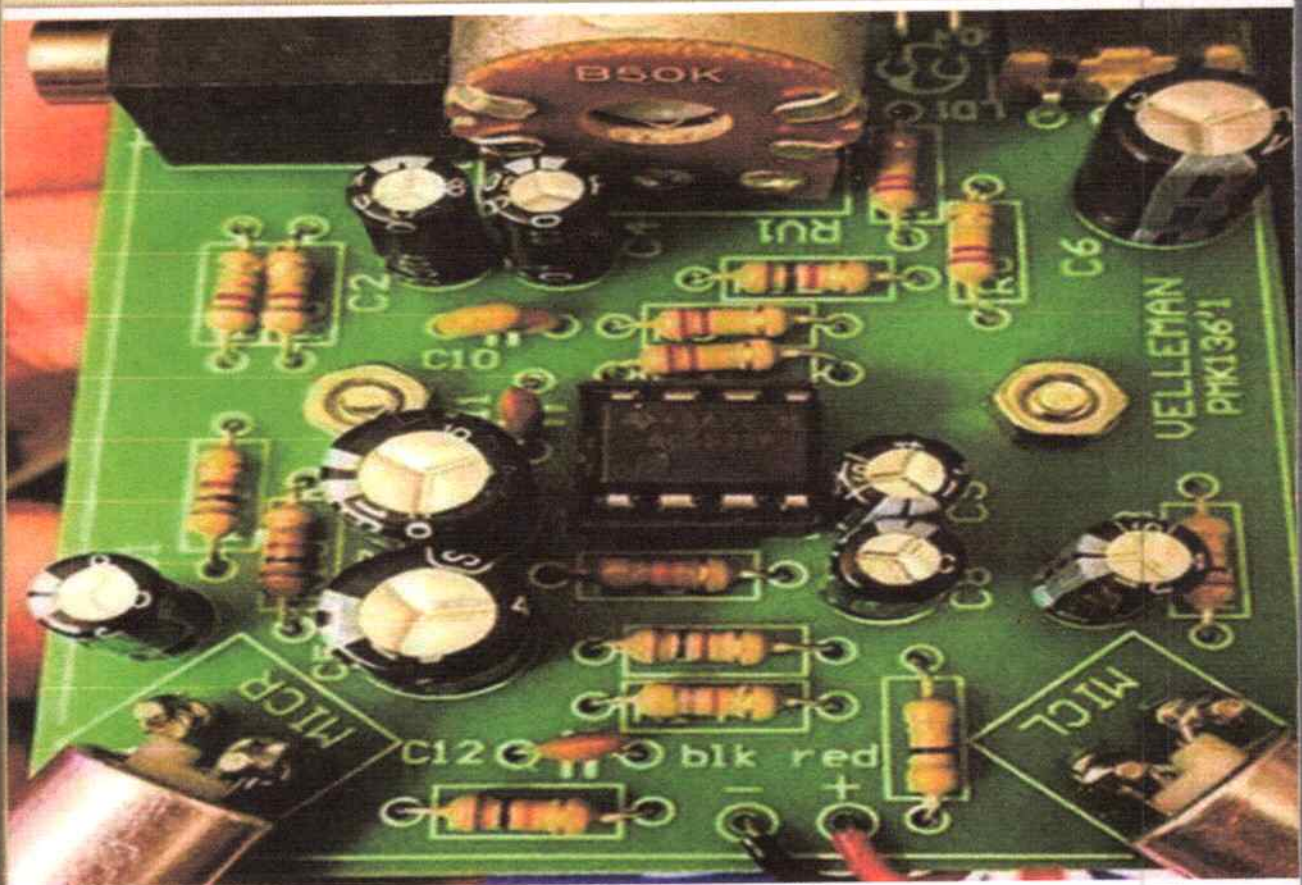
Dr. Ramana Pilla
Dr. M Surya Kalavathi
Dr. G T Chandra Sekhar

S. CHAND



PRINCIPAL
SRI SWAMI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Basic Electrical Engineering



S. CHAND

Dr. RAMANA PILLA
Dr. M. SURYAKALAVATHI
Dr. G.T. CHANDRA SEKHAR

Dr. G.T. Chandra Sekhar

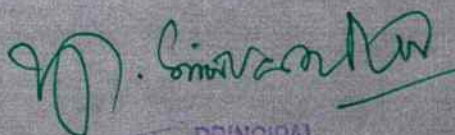
PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitrapalem Jn., SRIKAKULAM

Advances in Intelligent Systems and Computing 990

Himansu Sekhar Behera
Janmenjoy Nayak
Bighnaraj Naik
Danilo Pelusi *Editors*

Computational Intelligence in Data Mining

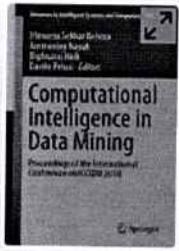
Proceedings of the International
Conference on ICCIDM 2018



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM



Springer



Conference procee

Computat Proceedings of

Janmenjoy Nayak

Department of Computer Science and Engineering, Sri Sivani
College of Engineering, Srikakulam, India

[View editor publications](#)

[Home](#) > [Conference proceedings](#)

You can also search for this editor in
[PubMed](#) | [Google Scholar](#)

Editors: [Himansu Sekhar Behera](#), [Janmerjyot Nayak](#),
[Bighnaraj Naik](#), [Danilo Pelusi](#)

Contains current research issues of developments of
soft computing, data mining and computational
intelligence

Presents applications of current issues of research in
green computing, big data analysis and nature inspired
computing

Introduces attractive resource to meet new research
challenges and problem findings in data mining

Part of the book series: [Advances in Intelligent
Systems and Computing](#) (AISC, volume 990)

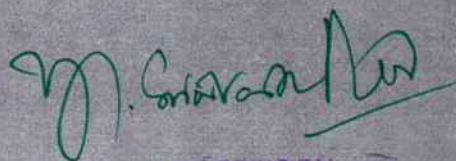
PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitlakapalem Jn., SRIKAKULAM

Advances in Intelligent Systems and Computing 999


Asit Kumar Das
Janmenjoy Nayak
Bighnaraj Naik
Soumen Kumar Pati
Danilo Pelusi *Editors*

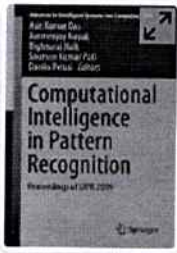
Computational Intelligence in Pattern Recognition

Proceedings of CIPR 2019



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapatem Jn., SRIKAKULAM

 Springer



Conference proceedings | © 2020

Comp **Janmenjoy Nayak**

Reco Department of Computer Science and Engineering, Sri Sivani College
Proceed of Engineering, Srikakulam, India

[View editor publications](#)

[Home](#) > [Conference proce](#) You can also search for this editor in
[PubMed](#) | [Google Scholar](#)

Editors: [Asit Kumar Das](#), [Janmer](#), [Nayak](#), [Bignnara](#),
[Naik](#), [Soumen Kumar Pati](#), [Danilo Pelusi](#)

Appeals to scholars working in pattern recognition and other engineering fields

Presents the latest computational intelligence methodologies and applications

Serves as a reference resource for researchers and students

Part of the book series: [Advances in Intelligent Systems and Computing](#) (AISC, volume 999)

168k Accesses | **334** Citations | **3** Altmetric

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

TLBO Algorithm Optimized Fractional-Order PID Controller for AGC of Interconnected Power System



Tulasichandra Sekhar Gorripotu, Halini Samalla, Ch. Jagan Mohana Rao, Ahmad Taher Azar and Danilo Pelusi

Abstract The present study focuses on the problem of automatic generation control (AGC) by employing the design of fractional-order proportional–integral–derivative controller (FOPID). A hydrothermal power system with governor dead band (GDB) and generation rate constraint (GRC) is considered for investigation. FOPID controller optimal values are obtained by using teacher learning-based optimization (TLBO) technique, and the employed objective function is integral time-multiplied absolute error (ITAE). The supremacy of the proposed controller is also shown by comparing with PID controller. Further, the performance of the system is analyzed by varying parameter values of the system. From the simulation results, it reveals that TLBO optimized FOPID controller minimizes the errors in frequency of the control areas and tie-line power effectively.

Keywords AGC • FOPID • ITAE • TLBO

T. S. Gorripotu (✉) · H. Samalla · Ch. Jagan Mohana Rao
Department of Electrical & Electronics Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: gtchsekhar@gmail.com

H. Samalla
e-mail: halini.samalla@gmail.com

Ch. Jagan Mohana Rao
e-mail: ch.jagan211@gmail.com

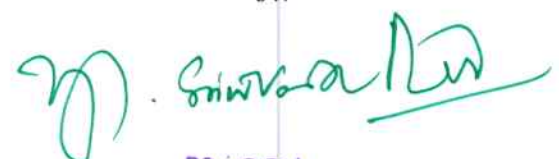
A. T. Azar
Faculty of Computers and Information, Benha University, Banha 13511, Egypt
e-mail: ahmad_t_azar@ieee.org

D. Pelusi
Communication Sciences, University of Teramo, Coste Sant'Agostino Campus,
Teramo, Italy
e-mail: dpelusi@unite.it

A. T. Azar
School of Engineering and Applied Sciences, Nile University,
Sheikh Zayed District—Juhayna Square, 6th of October City, Giza 12588, Egypt

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_80

847


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Crow Search Optimization-Based Hybrid Meta-heuristic for Classification: A Novel Approach

Bighnaraj Naik and Janmenjoy Nayak

Abstract This paper proposed a novel crow search optimization-based hybrid approach to solve classification problem of data mining. Being a recently developed population-based algorithm, crow search algorithm (CSA) has been strived the attention of all range researchers to solve wide range of complex engineering and optimization problems. In this paper, CSA is used with functional link neural network to solve classification problem. The results of the proposed method have been compared with other swarm-based approaches, and the experimental results reveal that the proposed method is superior to others.

Keywords Crow search optimization • FLANN • Classification

1 Introduction

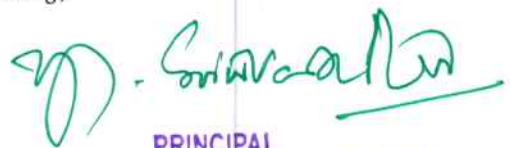
The original evolvement of the term “meta-heuristic” is quite interesting and intends to solve different wide range of problems through heuristic methods. The algorithmic framework of meta-heuristic approaches is quite simple as general algorithms which help to apply them for solving the real-life problems with a few modifications. The broad classification of meta-heuristic-based algorithms can be of

B. Naik
Department of Computer Application, Veer Surendra Sai University of Technology,
Burla, Sambalpur 768018, Odisha, India
e-mail: mailtobnaik@gmail.com

J. Nayak (✉)
Department of Computer Science and Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: mailforjnayak@gmail.com

© Springer Nature Singapore Pte Ltd. 2018
P. K. Pattnaik et al. (eds.), *Progress in Computing, Analytics and Networking*,
Advances in Intelligent Systems and Computing 710,
https://doi.org/10.1007/978-981-10-7871-2_74

775


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Chemical Reaction Optimization: A Survey with Application and Challenges



Janmenjoy Nayak, Sura Paparao, Bighnaraj Naik, N. Seetayya,
P. Pradeep, H. S. Behera and Danilo Pelusi

Abstract Both physical and chemical objects, properties, behaviours have remained a great inspiration for the optimization community to develop competitive algorithms in contrast to nature-inspired, swarm- and evolutionary-based algorithms. Although the number of developments in both the areas is only a few, still those algorithms are quite efficient to compete with other nature-inspired algorithms. In this paper, a brief review on a novel chemical reaction optimization algorithm is presented with its applications. The algorithm is based on certain chemical properties and has been a keen interest for solving various problems. Further, some future challenges are discussed for further improvements and applicability in other real-life problems.

J. Nayak (✉) · S. Paparao · N. Seetayya · P. Pradeep
Department of CSE, Sri Sivani College of Engineering, Srikakulam 532410, AP, India
e-mail: mailforjnayak@gmail.com

S. Paparao
e-mail: surapaparao@gmail.com

N. Seetayya
e-mail: seeth.n@gmail.com

P. Pradeep
e-mail: pradeepau.mtech@gmail.com

B. Naik
Department of Computer Application, Veer Surendra Sai University
of Technology, Burla, Sambalpur 768018, Odisha, India
e-mail: mailtobnaik@gmail.com

H. S. Behera
Veer Surendra Sai University of Technology, Burla, Sambalpur 768018,
Odisha, India
e-mail: mailtohsbehera@gmail.com

D. Pelusi
Communication Sciences, University of Teramo, Coste Sant'agostino Campus,
Teramo, Italy
e-mail: dpelusi@unite.it

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_50

507

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

Soft Computing-Based Intrusion Detection Approaches: An Analytical Study



D. Neelima, J. Karthik, K. Aravind John, S. Gowthami
and Janmenjoy Nayak

Abstract In the recent days, intrusion detection system using soft computing methods is one of the most interesting and attractive areas of research. Soft computing majorly undergoes with uncertainty, partial truth to gain robustness and low-cost solution. Intrusion detection system is a device or software application that monitors a network or system from unwanted activities. If the system detects any malware, it reports to the administrator or collects using security information. To develop efficient security methods, many researchers used fuzzy logic, neural network, machine learning, support vector machines, evolutionary computation, and probabilistic reasoning techniques. In this paper, a brief analysis has been conducted on various soft computing techniques for the successful detection of intrusive behaviors. Further, some future challenges with advantages and limitations are highlighted in a successive manner.

Keywords Intrusion detection · Soft computing · Neural network
FCM · Swarm intelligence

D. Neelima · J. Karthik · K. Aravind John · S. Gowthami · J. Nayak (✉)
Department of Computer Science & Engineering, Sri Sivani College of Engineering,
Chilakapalem, Srikakulam 532410, AP, India
e-mail: mailforjnyak@gmail.com

D. Neelima
e-mail: neelima947@gmail.com

J. Karthik
e-mail: karthik.jallu@gmail.com

K. Aravind John
e-mail: aravind.mahima@gmail.com

S. Gowthami
e-mail: simhadrigowthami@gmail.com

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_61

635

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Empirical Analysis on Cancer Dataset with Machine Learning Algorithms



T. PanduRanga Vital, M. Murali Krishna, G. V. L. Narayana,
P. Suneel and P. Ramarao

Abstract For the medical database, the usage of data mining methods in particular for cancer and related diseases has been recently escalating. The patient's life is dependent upon the outcome of these methodologies—and hence utmost care is taken to predict or suggest the correct medicines for the concerned disease. In this, we collected cancer data from zone 1 districts of Andhra Pradesh (AP) and conduct the statistical analysis and analyzed performance of the dataset for predicting cancer with supervised machine learning algorithms. The study shows good statistical results for preventing the cancer in zone 1 of AP as well the classification algorithms like decision tree, ADT, Naïve Bayes, BayesNet, K-Star, and Random Forest algorithms give the good results for prediction of cancer. All applied algorithms show above 96% accuracy. In comparison, k-star model is performed 100% with less model construction time (0.01).

Keywords Cancer · Machine learning · Data mining · Classification

T. PanduRanga Vital (✉) · M. Murali Krishna · G. V. L. Narayana · P. Suneel ·
P. Ramarao

Department of CSE, Sri Sivani College of Engineering, Srikakulam 532402,
Andhra Pradesh, India
e-mail: vital2927@gmail.com

M. Murali Krishna
e-mail: maadugula@gmail.com

G. V. L. Narayana
e-mail: gvln60.gmrit@gmail.com

P. Suneel
e-mail: suneelpappala@gmail.com

P. Ramarao
e-mail: paraselli@yahoo.com

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_75

789

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Analysis of Cancer Data Set with Statistical and Unsupervised Machine Learning Methods



T. Panduranga Vital, K. Dileep Kumar, H. V. Bhagya Sri
and M. Murali Krishna

Abstract Research on cancer is very important where cancer is one of the leading diseases which causes more deaths worldwide. Data mining is very useful for analysis of medical data, especially in cancer. Statistical analysis results are very useful for assumptions, preventions and diagnosis of cancer. The main aim of this paper is analysing the cancer data set collected from zone 1 (Srikakulam, Vizianagaram, Visakhapatnam) of Andhra Pradesh for estimations or diagnosis and preventions of cancer disease. The analysis is very useful with its good results. In this, we use statistical and clustering methods like k-means and hierarchical and multidimensional scaling (MDS). As per the statistical reports, most of the women are affected by cancer than men in the zone 1 of AP. Most of the women cancer patients suffered from breast cancer, and most of the men cancer patients are affected by lung cancer. The analysis also gives interesting results about living styles and habits linked with cancer. Unsupervised machine learning algorithms also give the good results for predicting cancer. The hierarchical cluster study projections clearly describe the cause of occurring cancer in zone 1 districts of Andhra Pradesh that the main combination factors are smoke, drink, gutkha (chewing tobacco) and related job.

T. Panduranga Vital (✉) · K. Dileep Kumar · H. V. Bhagya Sri · M. Murali Krishna
Department of Computer Science & Engineering,
Sri Sivani College of Engineering, Srikakulam, Andhra Pradesh, India
e-mail: vital2927@gmail.com

K. Dileep Kumar
e-mail: kadamati.dileep@gmail.com

H. V. Bhagya Sri
e-mail: bhagya.hanumanthu@gmail.com

M. Murali Krishna
e-mail: maadugula@gmail.com

© Springer Nature Singapore Pte Ltd. 2019
S. C. Satapathy et al. (eds.), *Smart Intelligent Computing and Applications*,
Smart Innovation, Systems and Technologies 104,
https://doi.org/10.1007/978-981-13-1921-1_27

267

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Analysis of Various Fraud Behaviors Using Soft Computing Techniques



D. Priyanka and H. V. Bhagya Sri

Abstract These days, most associations, organizations, and government offices have embraced electronic trade to expand their profitability or effectiveness in exchanging items or administrations; in territories, for example, credit card, media transmission, healthcare insurance, computer intrusion, automobile insurance, online auction, and so forth are likewise utilized by genuine clients and fraudsters. There are some issues and difficulties that ruin the execution of FDS. This paper presents an extensive survey of soft computing methodologies used to protect against difficulties which are faced by the fraud detection system in three distinct fraud areas, i.e., credit card, media transmission, healthcare insurance.

Keywords Fraud • Fraud detection system (FDS) • Credit card
Media transmission • Healthcare insurance • Large dataset

1 Introduction

Fraud means a portrayal of a self-evident reality—regardless of whether by words or by lead, by false or deluding assertions, or by disguise of what ought to have been revealed—that misdirects and is proposed to deceive another with the goal that the individual will follow up on it to her or his legitimate damage. In the fast-changing technological environment, all mechanical structure that incorporates money and organizations can be exchanged off by counterfeit acts, such as credit card, media transmission, and healthcare insurance [1]. The most common areas for detecting fraud are shown in Fig. 1.

D. Priyanka (✉) • H. V. Bhagya Sri
Department of Computer Science and Engineering, Sri Sivani College of Engineering,
Srikakulam 532410, Andhra Pradesh, India
e-mail: dabbeerupriyanka90@gmail.com

H. V. Bhagya Sri
e-mail: bhagya.hanumanthu@gmail.com

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_58

601

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Student Performance Analysis with Using Statistical and Cluster Studies



T. PanduRanga Vital, B. G. Lakshmi, H. Swapna Rekha
and M. DhanaLakshmi

Abstract Education is the backbone and significant factor in development of a country. The research on education system and performance of student's learning are very important for educational institutions and government to make decisions on quality education. This study analyzes the student's performance by using statistical and unsupervised machine learning (hierarchical and k-means) algorithms. These statistical reports are useful for student's educational strategies and their performance. As per statistical reports, one student education is mainly dependent on the family background, his personal profile, and his activities. Interestingly, some of factors like alcohol consumption, outing (going outside with friends), and romance are also impacted on his education and his result. The unsupervised machine learning algorithms like k-means and hierarchical cluster studies give the good results for predicting performance (pass or fail) of the student. The hierarchal cluster study projects the cause of pass and failure of students by different factors like family size, alcoholic consumption on working days and weekends, address (rural/urban), sex (male/female), and student regularity.

Keywords Education · Student's performance · Data mining
Clustering · Projections

T. PanduRanga Vital (✉) · B. G. Lakshmi · H. Swapna Rekha · M. DhanaLakshmi
Department of CSE, Sri Sivani College of Engineering, Srikakulam 532402,
Andhra Pradesh, India
e-mail: vital2927@gmail.com

B. G. Lakshmi
e-mail: bglaks.05@gmail.com

H. Swapna Rekha
e-mail: swapnarekha23@gmail.com

M. DhanaLakshmi
e-mail: dhana5831@gmail.com

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_71

743


PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Efficient High-Utility Itemset Mining Over Variety of Databases: A Survey



U. Suvarna and Y. Srinivas

Abstract High-utility itemset mining (HUIM) is creating new heights of challenge in the areas of research in big data analytics blending data structures, AI, and machine learning techniques to find efficient utility patterns. In the recent past, the merchandise market researchers were pretty much interested in analyzing the purchasing patterns and forecast new profitable area of business. HUIM is that one kind where we get business intelligence and has become the most basic method of finding the knowledge in decision making and optimizing the decisions of market analysis, streaming analysis, biomedicine, mobile computing, stock exchanges, etc. HUIM was initially applied widely in the transactional databases, later applied recursively in incremental databases, further moved to dynamic databases like temporal, spatial, and data stream databases. This chapter highlights the insights of various existing algorithms present in the literature based on several applications and tries to update the various availabilities of different approaches for coining latest research in this domain.

Keywords Associate rule · Itemset/pattern mining · High-utility itemset mining (HUIM) · Frequent · Periodic · Incremental

1 Introduction

Initially before data mining came into existence, huge amount of data was collected on a daily basis and are stored in the databases for years together and of no business interest. It all started with the retailers who were collecting large data on daily day-to-day activities from their grocery stores. Retailers were interested to analyze

U. Suvarna (✉)

Department of CSE, Sri Sivani College of Engineering, Srikakulam 532410,
AP, India

e-mail: viksonio@gmail.com

U. Suvarna · Y. Srinivas

Department of IT, Gitam University, Visakhapatnam 530045, AP, India

e-mail: sriteja.y@gmail.com

© Springer Nature Singapore Pte Ltd. 2019
J. Nayak et al. (eds.), *Soft Computing in Data Analytics*,
Advances in Intelligent Systems and Computing 758,
https://doi.org/10.1007/978-981-13-0514-6_76

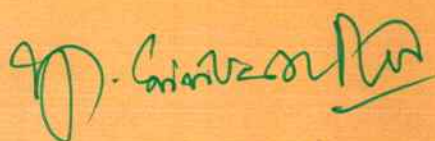
803

PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

Janmenjoy Nayak · Ajith Abraham
B. Murali Krishna
G. T. Chandra Sekhar
Asit Kumar Das *Editors*

Soft Computing in Data Analytics

Proceedings of International
Conference on SCDA 2018



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM

 Springer

Janmenjoy Nayak · Ajith Abraham
B. Murali Krishna · G. T. Chandra Sekhar
Asit Kumar Das
Editors

Soft Computing in Data Analytics

Proceedings of International Conference
on SCDA 2018

 Springer



PRINCIPAL
SRISIVANI COLLEGE OF ENGINEERING
Chitakapalem Jn., SRIKAKULAM

Editors

Janmenjoy Nayak
Department of Computer Science
and Engineering
Sri Sivani College of Engineering
Srikakulam, Andhra Pradesh
India

G. T. Chandra Sekhar
Department of Electrical
and Electronics Engineering
Sri Sivani College of Engineering
Srikakulam, Andhra Pradesh
India

Ajith Abraham
Machine Intelligence Research Labs
(MIR Labs)
Scientific Network for Innovation
and Research Excellence
Washington
USA

Asit Kumar Das
Department of Computer Science
and Technology
Indian Institute of Engineering Science
and Technology (IIEST), Shibpur
Howrah, West Bengal
India

B. Murali Krishna
Department of Mechanical Engineering
Sri Sivani College of Engineering
Srikakulam, Andhra Pradesh
India

ISSN 2194-5357 ISSN 2194-5365 (electronic)
Advances in Intelligent Systems and Computing
ISBN 978-981-13-0513-9 ISBN 978-981-13-0514-6 (eBook)
<https://doi.org/10.1007/978-981-13-0514-6>

Library of Congress Control Number: 2018941982


© Springer Nature Singapore Pte Ltd. 2019

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore



PRINCIPAL
SRI SIVANI COLLEGE OF ENGINEERING
Chilakapalem Jn., SRIKAKULAM