

2022 International Conference on Computational Modelling, Simulation and Optimization (ICCMSO 2022)

**Pathum Thani, Thailand
23-25 December 2022**



**IEEE Catalog Number: CFP22DU4-POD
ISBN: 979-8-3503-3289-6**

**Copyright © 2022 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP22DU4-POD
ISBN (Print-On-Demand):	979-8-3503-3289-6
ISBN (Online):	979-8-3503-3288-9

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2022 International Conference on Computational Modelling, Simulation and Optimization (ICCMSO) **ICCMSO 2022**

Table of Contents

Message from the Conference Chairs	xiv
Message from the General Chair	xv
Message from the Program Chair	xvi
Message from the Organizing Secretaries	xvii
Organizing Committee	xviii
Program and Advisory Committee	xix
Reviewers	xxi
Keynote	xxv
Plenary/Invited Speech	xxvii

Artificial Intelligence and Machine Learning

Age Based News Classification using LSTM and BERT	1
<i>Tahiya Ahmed Chowdhury (Ahsanullah University of Science and Technology, Bangladesh), Nusrat Jahan Tonoya (Ahsanullah University of Science and Technology, Bangladesh), Takiya Maliha (Ahsanullah University of Science and Technology, Bangladesh), Parsia Akter (Ahsanullah University of Science and Technology, Bangladesh), and Md Shahriar Mahbub (Ahsanullah University of Science and Technology, Bangladesh)</i>	
Missing Data Analysis in Traffic Monitoring System using LSTM	7
<i>Rishabh Jain (UIET, MDU, Rohtak, India), Sunita Dhingra (UIET, MDU, Rohtak, India), and Kamaldeep Joshi (UIET, MDU, Rohtak, India)</i>	
Underwater Image Dehazing using Dark Channel Prior and Filtering Techniques	12
<i>Renjith V. Ravi (M.E.A Engineering College, India), S. B. Goyal (Faculty of Information Technology City University, Malaysia), and Sardar M N Islam (ISILC, Victoria University, Australia)</i>	
A Framework for Predicting Course Time Duration using Mapreduce and K-Means	17
<i>Ashim Sharma (Chandigarh University, India) and Surender Singh (Chandigarh University, India)</i>	
HRM and Role of Artificial Intelligence: Triple Bottom Line Sustainability	23
<i>Raman Chadha (Chandigarh University, Punjab) and Anchal Mehta (Chandigarh University, Punjab)</i>	

Analysis of Some Popular AI & ML Algorithms Used in Agriculture	28
<i>Shivani Shivani (Indira Gandhi University, India), Satinder Bal Gupta (Indira Gandhi University, India), Raj Kumar Yadav (UIET, MDU Rohtak, India), Reena Hooda (Indira Gandhi University, India), Sunita Dhingra (UIET, MDU Rohtak, India), and Monika Gupta (Vaish College, India)</i>	
An Investigation of the Bibliometric Landscape of the Many Facets of Machine Learning from the Years 2000 to 2022	34
<i>Neeru Sharma (UIE, Chandigarh University, Punjab) and Raman Chadha (UIE, Chandigarh University, Punjab)</i>	
State of the Art, Recent Developments, and Future Directions in Applying Deep Learning to Part of Speech Tagging in NLP	38
<i>Royal Kaushal (Chandigarh University, India) and Raman Chadha (Chandigarh University, India)</i>	
Toward Dynamic Enterprise Architecture Model using MAPE-K, Control Theory and Machine Learning to Achieve Autonomic Adaptiveness	42
<i>Imane Ettahiri (ENSIAS, Mohamed V University in Rabat, Morocco), Lahbib Ajallouda (ENSIAS, Mohamed V University in Rabat, Morocco), Karim Doumi (ENSIAS, Mohamed V University in Rabat, Morocco), and Ahmed Zellou (ENSIAS, Mohamed V University in Rabat, Morocco)</i>	
Automated Interoperability Based on Decision Tree for Schema Matching	48
<i>Mohamed Raoui (Mohammed V University in Rabat, Morocco), Latifa Rassam (Mohammed V University in Rabat, Morocco), Moulay Hafid El Yazidi (Mohammed V University in Rabat, Morocco), and Ahmed Zellou (Mohammed V University in Rabat, Morocco)</i>	
Deep Network-Based Slow Feature Analysis for Human Fall Detection	53
<i>Anima Pramanik (IIT Kharagpur, India), Kavya Venkatagiri (IIT Kharagpur, India), Sobhan Sarkar (IIM Ranchi, India), and Sankar K. Pal (Indian Statistical Institute, India)</i>	
Quantum Machine Learning and Quantum Communication Networks: The 2030s and the Future ...	59
<i>Shveta Jain (PIET Panipat, India), Anju Gandhi (PIET Panipat, India), Sanjay Singla (CSE, UIE, Chandigarh University, India), Lucy Garg (CSE -ET Department PIET Panipat), and Stuti Mehla (CSE -ET Department PIET Panipat, India)</i>	

Nature - Inspired Computing and Optimization

A Multi-Stage Event Detection Model for Video Datasets Nature-Inspired and Optimized Feature-Based Learning Model	67
<i>Raman Chadha (Chandigarh University, Punjab), Sanjay Singla (Chandigarh University, Punjab), and Md Abdul Wassay (Chandigarh University, Punjab)</i>	
Examining Influence of Marketing Methods on Adolescents Buying Perceptions using AHP	73
<i>Kanika Budhiraja (Maharishi Markandeshwar (Deemed to be) University, India) and Meenu Gupta (Maharishi Markandeshwar (Deemed to be) University, India)</i>	
Modified Approach for Optimization of Unbalanced Fuzzy Transportation Problem	79
<i>Lokesh Kumar Bhuranda (Manipal University Jaipur, India) and Mohammad Rizwanullah (Manipal University Jaipur, India)</i>	

Practicing Topology Optimization Workflow for Structural Simulation and Customized Splint Fabrication	84
<i>Ashwani Kumar (UIET Maharshi Dayanand University, India) and Deepak Chhabra (UIET Maharshi Dayanand University, India)</i>	
Enhancing Dimensional Accuracy of Small Parts Through Modelling and Parametric Optimization of the FDM 3D Printing Process Using GA-ANN	89
<i>Mannu Yadav (University Institute of Engineering and Technology, India), Ashish Kaushik (Deenbandhu Chhotu Ram University of Science and Technology, India), Ramesh Kumar Garg (Deenbandhu Chhotu Ram University of Science and Technology, India), Mohit Yadav (University Institute of Engineering and Technology, India), Deepak Chhabra (University Institute of Engineering and Technology, India), Shivam Rohilla (University Institute of Engineering and Technology, India), and Hitesh Sharma (University Institute of Engineering and Technology, India)</i>	
Optimize Inventory Stock using Period Review System: A Case Study at Seafood-Based Company..	95
<i>Sri Susilawati Islam (Sampoerna University, Jakarta), Annisa Putri Penika (Sampoerna University, Jakarta), and Christian Haposan Pangaribuan (Sampoerna University, Jakarta)</i>	
Sardine Feast Metaheuristic Optimization with Random Walk for Global Optimization	101
<i>Mohammad Faizul Nasrudin (Universiti Kebangsaan Malaysia, Malaysia), Dwi Yanuar Panji Tresna (Universiti Kebangsaan Malaysia, Malaysia), Salwani Abdullah (Universiti Kebangsaan Malaysia, Malaysia), and Hafiz Mohd Sarim (Universiti Kebangsaan Malaysia, Malaysia)</i>	
Combinatorial Optimization of Type-1 Fuzzy Travelling Salesman Problem	108
<i>Jay Chandra Yadav (Manipal University Jaipur, India) and Mohammad Rizwanullah (Manipal University Jaipur, India)</i>	
Investigation of Social Risk Factors of PPP Infrastructure Projects in Vietnam using Grey AHP	117
<i>Phong Thanh Nguyen (Ho Chi Minh City Open University, Vietnam) and Duy The Tran (Ho Chi Minh City University of Technology (HCMUT)- Vietnam National University Ho Chi Minh City, Vietnam)</i>	
Analyzing Textual Documents Indexes by Applying Key-Phrases Extraction in Fuzzy Logic Domain Based on a Graphical Indexing Methodology	122
<i>Latifa Rassam (Mohammed V University in Rabat, Morocco), Mohamed Raoui (Mohammed V University in Rabat, Morocco), Ahmed Zellou (Mohammed V University in Rabat, Morocco), and Moulay Hafid El Yazidi (Mohammed V University in Rabat, Morocco)</i>	
Response Surface Methodology in Valorization Process Modelling of Different Wastes	127
<i>Rajneesh Kaushal (National Institute of Technology Kurukshetra, India) and Sonam Sandhu (National Institute of Technology Kurukshetra, India)</i>	
Optimization of Hardness and Tensile Strength of Stir Cast Hybrid Aluminum Metal Matrix Composite using Grey Relational Analysis	132
<i>Singh S (National Institute of Technology, India), Angra S (National Institute of Technology, India), and Kumar D (National Institute of Technology, India)</i>	

ANOVA Analysis of Hydrogen-Fuelled Compression Ignition Engine for Sustainable Mobility	137
<i>Govind Sharma (National Institute of Technology Kurukshetra, India)</i> <i>and Rajneesh Kaushal (National Institute of Technology Kurukshetra, India)</i>	
Performance Analysis of Rice Bran oil Biodiesel Blends-Based CI ENGINE using DOE Approach ..	143
<i>Sunil Dhingra (U.I.E.T Kurukshetra University, India), Rahul Raghav (U.I.E.T Kurukshetra University, India), Kovács András (University of Pannonia, Hungary), and Rohit Khargotra (University of Pannonia, Hungary)</i>	
On Algebraic Characteristics of Fuzzy T-Sub Algebra in T-Algebra Under the Normalization	149
<i>Premkumar M (Sathyabama Institute of Science and Technology (Deemed To Be University), India), Girija Bai H (Sathyabama Institute of Science and Technology (Sathyabama University), India), Prasanna A (Jamal Mohamed College (Affiliated to Bharathidasan University), India), Parmar K.P.S. (University of Petroleum and Energy Studies, India), Karuna M.S (M.J.P. Rohilkhand University, India), and Moti Lal Rinawa (Government Engineering College, India)</i>	
Combinatorial Optimization of Non-Linear Multicommodity Network Flow using Pseudo Quasi-Newton Method	152
<i>Gautam Beniwal (Manipal University Jaipur, India) and Mohammad Rizwanullah (Manipal University Jaipur, India)</i>	
Chaotic Bee Colony Optimization For Enhancing Life Span Of Wireless Sensor Networks	158
<i>Amarpreet Singh (AGC amritsar, India) and Priyanka Sharma (AGC amritsar, India)</i>	

Data Analysis, Digital Image, and Video Processing

Implementation Platforms and Strategy for the Knowledge Discovery from the Data	166
<i>Monika Monika (Chandigarh University, Mohali) and Mohammad Shauib (Chandigarh University, Mohali)</i>	
Colour Image Encryption using Chaotic Trigonometric Map and DNA Coding	172
<i>Renjith V. Ravi (M.E.A Engineering College, India), S. B. Goyal (Faculty of Information Technology City University, Malaysia), and Sardar M N Islam (ISILC, Victoria University, Australia)</i>	
Classification of Various Stages of Herniated Cervical Spine Images using EDGE Detection Operators	177
<i>C. Malarvizhi (Dr. N. G.P Arts and Science College, Coimbatore) and P. Balamurugan (Government Arts College, India)</i>	
Analysis of DenseNet201 with SGD Optimizer for Diagnosis of Multiple Rice Leaf Diseases	182
<i>Shikha Prasher (Chitkara University Insititue of Engineering & Technology, Chitkara University, India), Leema Nelson (Chitkara University Insititue of Engineering & Technology, Chitkara University, India), and Avinash Sharma (Maharishi Markandeshwar (Deemed to be University), India)</i>	
SEASONAL SALE PREDICTION IN PYTHON	187
<i>Piyush Piyush (Chandigarh University, India), Sanjay Singla (Chandigarh University, India), Indu Sharma (Chandigarh University, India), and Md Abdul Wassay (Chandigarh University, India)</i>	

Cloud Computing Virtual Machine Migration Methodology	193
<i>Gurpreet Singh Panesar (Chandigarh University, India) and Raman Chadha (Chandigarh University, India)</i>	
Energy Efficient Resource Allocation in Cloud Data Center: A Comparative Analysis	201
<i>Nidhika Chauhan (Chandigarh University, India), Navneet Kaur (Chandigarh University, India), and Kamaljit Singh Saini (Chandigarh University, India)</i>	
Define and Optimize the Competitive Advantage Value using DMADV Approach: A Case Study at PT Telkom Indonesia	207
<i>Sri Susilawati Islam (Sampoerna University, Indonesia) and Muhtia Luchfi (Sampoerna University, Indonesia)</i>	
Keyphrases Extraction: Approach Based on Document Paragraph Weights	214
<i>Lahbib Ajallouda (ENSIAS, Mohammed V University in Rabat, Morocco), Ahmed Zellou (ENSIAS, Mohammed V University in Rabat, Morocco), Imane Ettahiri (ENSIAS, Mohammed V University in Rabat, Morocco), and Karim Doumi (ENSIAS, Mohammed V University in Rabat, Morocco)</i>	
Integration of Net Promoter Score and DMAIC Approach to Measure Customer Satisfaction in Packaging Industry	220
<i>Filscha Nurprihatin (Sampoerna University, Indonesia), Nur Rizka Mardhatillah (Sampoerna University, Indonesia), Michael Nayat Young (Mapúa University, Philippines), Surya Danusaputro Liman (Sampoerna University, Indonesia), Anak Agung Ngurah Perwira Redi (Sampoerna University, Indonesia), and Yogi Tri Prasetyo (Mapúa University, Philippines)</i>	
Centralized and Reliable Digital Twin Models for Smart City's Buildings Protection During Disaster	226
<i>Md. Sameeruddin Khan (Presidency University, India), R. Chinnaiyan (Presidency University, India), S. Balachandar (CMR Institute of Technology, India), S. Jafar Ali Ibrahim (VIT Deemed to be University, India), N.S. Kalyan Chakravarthy (QIS College of Engineering and Technology, India), C. Kalaiarasan (Presidency University, India), and R. Divya (CMR Institute of Technology, India)</i>	
Exploring the Links Between Sustainability and Renewable Energy Supply Chain (RESC): A Bibliometric Analysis	230
<i>Ankita Singh (National Institute of Technology, India), Rajneesh Kaushal (National Institute of Technology Kurukshetra, India), and Dixit Garg (National Institute of Technology Kurukshetra, India)</i>	
Bayesian Estimators of Dynamic Cumulative Residual Entropy for Pareto Type II Distribution using Asymmetric Loss Function	235
<i>Savita Savita (Maharishi Dayanand University, India) and Rajeev Kumar (Maharishi Dayanand university, India)</i>	
A Note on Shrinkage Entropy Estimator for Mean of Exponential Distribution Considering Square Error Loss Function	243
<i>Neetu Malik (Maharshi Dayanand University, India), Priyanka Sahni (Maharshi Dayanand University, India), and Rajeev Kumar (Maharshi Dayanand University, India)</i>	

Application of Hybrid Encryption Methods in Digital Steganography Technique for Secure Communication	251
<i>Sharanpreet Kaur (Chandigarh University, India) and Surender Singh (Chandigarh University, India)</i>	
Performance Comparison of AI Models for Digital Image Captioning	257
<i>Rajwinder Kaur (Chitkara University Institute of Engineering and Technology, India) and Gurpreet Singh (Chitkara University Institute of Engineering and Technology, India)</i>	
Data Mining for Analyzing GEM's Entrepreneurial Growth Indicators	262
<i>Bernadus Lukas (Parahyangan Catholic University, Indonesia), Cecilia E. Nugraheni (Parahyangan Catholic University, Indonesia), and Vania Natali (Parahyangan Catholic University, Indonesia)</i>	

Internet of Things and Wireless Sensor Networks

Effects of Slot Shape in Performance of SIW Based Leaky Wave Antenna	268
<i>Manvinder Sharma (Chandigarh Group of Colleges, India), Anuj Kumar Gupta (Chandigarh Group of Colleges, India), Joginder Singh (Chandigarh Group of Colleges, India), Rinkesh Mittal (Chandigarh Engineering College, India), Harjinder Singh (Punjabi University, India), and Digvijay Pandey (Dr. A.P.J Abdul Kalam Technical University, India)</i>	
A Secure Authentication Mechanism for Accessing IoT Devices Through Mobile App	274
<i>Bhupinder Singh (Chandigarh University, India), Roop Lal (Chandigarh University, India), and Sanjay Singla (Chandigarh University, India)</i>	
Power-Efficient Wireless Sensor System for Structural Health Monitoring	279
<i>Cheonghwan Hwang (Inha University, Korea) and Jaehyun Park (Inha University, Korea)</i>	
To Study the Effect of Changing Load Pattern on Voltage Profile in RDS	285
<i>Meena Kumari (UIET, MDU, India), Surender Singh (UIET, MDU, India), Pinkey Singh (UIET, MDU, India), Manisha Sangwan (UIET, MDU, India), Sumit Tiwari (Shiv Nadar Institute of Emience Dadri, India), and Ravinder Kumar Sahdev (UIET, MDU, India)</i>	
An Efficient IoT e-Environment System to Monitor and Control Pollution and Maintain Hygienics in Educational Institutions	291
<i>Md Abdul Wassay (Chandigarh University, India), Karunendra Verma (Chitkarar University, India), and Sanjay Singla (Chandigarh University, India)</i>	
IoT in Smart Irrigation and Node MCU ESP 8266 Wi-Fi Module	296
<i>Roop Lal (Chandigarh University, India), Bhupinder Singh (Chandigarh University, India), and Md. Abdual Wassay (Chandigarh University, India)</i>	

Healthcare Analytics

3D Printable NiTi Alloys for Biomedical Applications: A State of art	301
<i>Deepak Chhabra (University Institute of Engineering and Technology, M.D.U, India), Upender Punia (Deenbandhu Chhotu Ram University of Science and Technology, India), Sumit Gahletia (Deenbandhu Chhotu Ram University of Science and Technology, India), Ramesh Kumar Garg (Deenbandhu Chhotu Ram University of Science and Technology, India), Ravin Sehrawat (University Institute of Engineering and Technology, MDU, India), Pinki Sehrawat (Punjab University, India), Ashwani Dhingra (University Institute of Engineering and Technology, M.D.U, India), and Ashish Kaushik (Deenbandhu Chhotu Ram University of Science and Technology, India)</i>	
A Thorough Analysis of Microsoft HoloLens Applications in the Medical and Healthcare Fields	307
<i>Sanchit Vashisht (Chitkara University Institute of Engineering and Technology, Chitkara University Punjab, India), Neha Tuli (Chitkara University Institute of Engineering and Technology, Chitkara University Punjab, India), Avinash Sharma (Maharishi Markandeshwar (Deemed to be University), India), Archana Mantri (Chitkara University Institute of Engineering and Technology, Chitkara University Punjab, India), and Shivam Sharma (Chitkara University Institute of Engineering and Technology, Chitkara University Punjab, India)</i>	
Bone Cancer Detection Techniques using Machine Learning	315
<i>Charnpreet Kaur (Chandigarh University, India) and Urvashi Garg (Chandigarh University, India)</i>	
Topological Simulation to Recognize the Steady State Thermal Behavior of Customized Finger Splint	320
<i>Ashwani Kumar (Maharshi Dayanand University, India) and Deepak Chhabra (Maharshi Dayanand University, India)</i>	
Data Security Breaches and Mitigating Methods in the Healthcare System: A Review	325
<i>Ricky Rajora (Chitkara University Institute of Engineering and Technology, Chitkara University, India), Amit Kumar (Chitkara University Institute of Engineering and Technology, Chitkara University Punjab, India), Shivani Malhotra (Chitkara University Institute of Engineering and Technology, Chitkara University Punjab, India), and Avinash Sharma (Maharishi Markandeshwar (Deemed to be University), India)</i>	
Yoga Asanas Pose Detection using Feature Level Fusion with Deep Learning-Based Model	331
<i>Kumar R (Kristu Jayanti College, India), Velmurugan R (Kristu Jayanti College, India), and Muruganantham A (Kristu Jayanti College, India)</i>	
Influence of Adam Optimizer with Sequential Convolutional Model for Detection of Tuberculosis	340
<i>Kanwarpartap Singh Gill (Chitkara University Institute of Engineering and Technology, Chitkara University, India), Avinash Sharma (Maharishi Markandeshwar (Deemed to be University), India), Vatsala Anand (Chitkara University Institute of Engineering and Technology, Chitkara University, India), Rupesh Gupta (Chitkara University Institute of Engineering and Technology, Chitkara University, India), and Pratibha Deshmukh (Bharati Vidyapeeth's Institute of Management and Information Technology, India)</i>	

A Study on Detection of Emotions with the help of Convolutional Neural Network	345
<i>Deepak Raj (Chandigarh University, India), Md Abdul Wassay (Chandigarh University, India), and Karunendra Verma (Chitkara University, India)</i>	
Advanced 3D Body Scanning Techniques and its Clinical Applications	352
<i>Ashish Kaushik (Deenbandhu Chhotu Ram University of Science and Technology, India), Sumit Gahletia (Deenbandhu Chhotu Ram University Of Science And Technology, India), Ramesh Kumar Garg (Deenbandhu Chhotu Ram University of Science and Technology, India), Pardeep Sharma (Deenbandhu Chhotu Ram University of Science and Technology, India), Deepak Chhabra (University Institute of Engineering and Technology, India), and Mohit Yadav (University Institute of Engineering and Technology, India)</i>	

Simulation, Modeling and Analysis

Computational Study on Desorption of Adsorbent Bed using COMSOL MultiPhysics in Vacuum Condition	359
<i>Manigandan Sidhareddy (Shiv Nadar Institution of Eminence, India) and Sumit Tiwari (Shiv Nadar Institution of Eminence, India)</i>	
Analysis of a Semi-Active Vibration Absorber Based on Magnetorheological Materials for a Half-car Model	364
<i>Jitender Kumar (National Institute of Technology Kurukshetra, India) and Gian Bhushan (National Institute of Technology Kurukshetra, India)</i>	
Centralized Digital Twin Driven Supply Chain for Sustainable Smart Manufacturing Plants	370
<i>Md. Sameeruddin Khan (Presidency University, India), R. Chinnaiyan (Presidency University, India), S. Balachandar (CMR Institute of Technology, India), S. Jafar Ali Ibrahim (VIT Deemed to be University, India), N.S. Kalyan Chakravarthy (QIS College of Engineering and Technology, India), C. Kalaiarasan (Presidency University, India), and R. Divya (CMR Institute of Technology, India)</i>	
Recent Advancements on Photovoltaic Thermal and Greenhouse Dryer	374
<i>Ravin Sehrawat (University Institute of Engineering and Technology, India), Ravinder Kumar Sahdev (University Institute of Engineering and Technology, India), Sumit Tiwari (Shiv Nadar Institute of Eminence, India), Pinki Sehrawat (Punjab University, India), and Arun Kumar (Shri Vishwakarma Skill University, India)</i>	
Impact of Various Manufacturing Processes On the Productivity of Composite Materials	379
<i>Dipesh Uike (Dr. Ambedkar Institute of Management Studies and Research, India) and Sushant Waghmare (Maharashtra National Law University, India)</i>	
Performance Study and Development of a 5-Axis C.N.C. Machine	385
<i>Mukesh Kumar (Government Engineering College Nawada, India), Rajesh Baitha (Government Engineering College Nawada, India), Santosh Kumar (Indian Institute of Technology (B.H.U.), India), and Rajneesh Kaushal (National Institute of Technology, India)</i>	

Effect of Twisted Tape on the Performance of Solar Collector	390
<i>Rohit Khargotra (University of Pannonia, Hungary), Kovács András (University of Pannonia, Hungary), Sunil Dhingra (U.I.E.T Kurukshetra University, India), and Navdeep Singh (NIT Kurukshetra, India)</i>	
A Review on Risk Management Framework for Large Scale Scrum	394
<i>Simran Kaur Khurana (Chandigarh University, India), Md Abdul Wassay (Chandigarh University, India), and Karunendra Verma (Chandigarh University, India)</i>	
Effect of Transmissivity on PV Module Glass for PVT-TEC air Collector	401
<i>Ajay Pratap Singh (Shiv Nadar Institution of Eminence, India), Sumit Tiwari (Shiv Nadar Institution of Eminence, India), Ravinder Kumar Sahdev (UIET, MDU, India), Harender Harender (Shiv Nadar Institution of Eminence, India), and Prabhakar Tiwari (MMMUT, India)</i>	
Consumer Buying Behaviour Toward Green Personal Care Products	407
<i>Jatinder Kaur (MMU, India) and Meenu Gupta (MMU, India)</i>	
Improvement in Dents at Gear Manufacturer Company Through Lean Six Sigma	412
<i>Prateek Guleria (Collage of Horticulture and Forestry Neri, India), Shubham Sharma (Shoolini University, India), Rakesh Kumar Shukla (Shoolini University, India), Sunil Dhingra (U.I.E.T Kurukshetra University, India), and Rohit Khargotra (Pannonia University, Hungary)</i>	
Role of Adolescents on Family Buying Behavior in Haryana	416
<i>Kanika Budhiraja (Maharishi Markandeshwar (Deemed to be) University, India) and Meenu Gupta (Maharishi Markandeshwar (Deemed to be) University, India)</i>	
Author Index	421