



American Journal of Operations Research



Journal Editorial Board

ISSN 2160-8830 (Print) ISSN 2160-8849 (Online)

https://www.scirp.org/journal/ajor

Editor-in-Chief

Prof. Jinfeng Yue Middle Tennessee State University, USA

Editorial Advisory Board

Prof. Bintong Chen University of Delaware, USA Prof. Wade D. Cook York University, Canada

Prof. Shu-Cherng Fang North Carolina State University, USA Prof. Panagiotis Kouvelis Washington University in St. Louis, USA

Prof. Lawrence M. Seiford University of Michigan, USA

Editorial Board

Dr. Eman Ahmed Alv Ismail College of International Transport & Logistics, Egypt

Dr. Javier De Andrés University of Oviedo, Spain Prof. Janine E. Aronson University of Georgia, USA

Dr. Annamaria Barbagallo University of Naples "Federico II", Italy

Prof. Atac Bascetin Mining Engineering Department, Engineering Faculty, Istanbul University

Cerrahpasa, Turkey

Dr. Nabil Belacel NRC Institute for Information Technology, Canada

Prof. Ignacio Castillo Wilfrid Laurier University, Canada

Prof. Xu Chen University of Electronic Science and Technology of China, China

Dr. Carlos Cruz Corona Department of Computer Science and Artificial Intelligence, University of Granada, Spain

Prof. Muhammad El-Taha University of Southern Maine, USA Dr. Carmen Galé University of Zaragoza, Spain

Prof. Xianghua Gan The Hong Kong Polytechnic University, China

Prof. Bibhas Chandra Giri Jadavpur University, India Prof. Said Ali Hassan El-Quliti Cairo University, Egypt

Prof. Xiuli He The University of North Carolina at Charlotte, USA Prof. Mhand Hifi University of Picardie Jules Verne, France

Prof. Myron Hlynka

Department of Mathematics and Statistics, University of Windsor, Windsor, Canada

Dr. Kai Huang DeGroote School of Business, McMaster University, Canada

Prof. Zhimin Huang Adelphi University, USA

Prof. Zhibin Jiang Shanghai Jiao Tong University, China Dr. Ricardo Josa-Fombellida University of Valladolid, Spain Prof. Nguyen Khac Minh Thang Long University, Vietnam Dr. Santosh Kumar RMIT University, Australia Prof. Dennis Leech University of Warwick, UK

Prof. Ulrike Leopold-Wildburger University of Graz, Austria Prof. Dengfeng Li Fuzhou University, China

Prof. Liang Liang University of Science and Technology of China, China

Dr. Pedro Lorca University of Oviedo, Spain

Prof. Sanat Kumar Mahato SidhoKanhoBirsha University, India

Dr. Patrick R. McMullen School of Business, Wake Forest University, USA Dr. Vishnu Narayan Mishra Indira Gandhi National Tribal University, India

Dr. Sankar Prasad Mondal Maulana Abul Kalam Azad University of Technology, India

Prof. Charles L. Munson Washington State University, USA Dr. Jamal Ouenniche University of Edinburgh, UK Prof. Joaquín Antonio Pacheco Bonrostro University of Burgos, Spain

Prof. Javier Ramirez Rodriguez The Metropolitan Autonomous University, Mexico

Prof. Bhaba R. Sarker Louisiana State University, USA

Prof. Renduchintala Raghavendra Kumar Sharma IIT Kanpur, India

Dr. Chunming (Victor) Shi Wilfrid Laurier University, Canada Prof. Andranik Tangian Karlsruhe Institute of Technology, Germany Prof. Etsuji Tomita The University of Electro-Communications, Japan

Prof. Delfim F. M. Torres University of Aveiro, Portugal Dr. Manish Verma McMaster University, Canada Dr. Yu Amy Xia Northeastern University, USA

Dr. Gongxian Xu School of Mathematical Sciences, Bohai University, China

Dr. Shenghan Xu University of Idaho, USA

Prof. Farouk Yalaoui University of Technology of Troyes (UTT), France

Dr. Jiping Yang Beihang University, China

Dr. Shilei Yang Southwestern University of Finance and Economics, China

Prof. Walid Tawfik Younes Mohamed Cairo University, Egypt

Dr. Xiaohang Yue University of Wisconsin-Milwaukee, USA

Prof. Zike Zhang Alibaba Research Center for Complexity Sciences, Hangzhou Normal University, China



ISSN Online: 2160-8849 ISSN Print: 2160-8830

Table of Contents

Volume 11	Number 5	September	r 2021
Unsupervised Me	ethods to Classify Real Data from (Offshore Wells	
A. O. De Salvo Ca	astro, M. De Jesus Rocha Santos, F. R. Le	eta, C. B. C. Lima, G. B. A. Lima	227
Breeding Particle Scheduling	Swarm Optimization for Railways	s Rolling Stock Preventive Maintenance	
T. Aboueldah, H.	Farag		242

American Journal of Operations Research (AJOR) Journal Information

SUBSCRIPTIONS

The *American Journal of Operations Research* (Online at Scientific Research Publishing, https://www.scirp.org/) is published bimonthly by Scientific Research Publishing, Inc., USA.

Subscription rates:

Print: \$79 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: sub@scirp.org

SERVICES

Advertisements

Advertisement Sales Department, E-mail: service@scirp.org

Reprints (minimum quantity 100 copies)

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: sub@scirp.org

COPYRIGHT

Copyright and reuse rights for the front matter of the journal:

Copyright © 2021 by Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY).

http://creativecommons.org/licenses/by/4.0/

Copyright for individual papers of the journal:

Copyright © 2021 by author(s) and Scientific Research Publishing Inc.

Reuse rights for individual papers:

Note: At SCIRP authors can choose between CC BY and CC BY-NC. Please consult each paper for its reuse rights.

Disclaimer of liability

Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:

E-mail: ajor@scirp.org



American Journal of Operations Research

ISSN 2160-8830 (Print) ISSN 2160-8849 (Online) https://www.scirp.org/journal/ajor

AJOR is an international scientific journal dedicated to the publication and public discussion of high quality, original papers that contribute to the methodology of operational research and to the practice of decision making.

Editor-in-Chief

Prof. Jinfeng Yue

Middle Tennessee State University, USA

Editorial Board

Dr. Eman Ahmed Aly Ismail
Dr. Javier De Andrés
Prof. Janine E. Aronson
Dr. Annamaria Barbagallo
Prof. Atac Bascetin
Dr. Nabil Belacel
Prof. Ignacio Castillo
Prof. Xu Chen
Dr. Carlos Cruz Corona
Prof. Muhammad El-Taha
Dr. Carmen Galé
Prof. Xianghua Gan
Prof. Bibhas Chandra Giri
Prof. Said Ali Hassan El-Quliti

Prof. Xiuli He Prof. Mhand Hifi Prof. Myron Hlynka Dr. Kai Huang Prof. Zhimin Huang
Prof. Zhibin Jiang
Dr. Ricardo Josa-Fombellida
Prof. Nguyen Khac Minh
Dr. Santosh Kumar
Prof. Dennis Leech
Prof. Ulrike Leopold-Wildburger
Prof. Dengfeng Li

Prof. Liang Liang
Dr. Pedro Lorca
Prof. Sanat Kumar Mahato
Dr. Patrick R. McMullen
Dr. Vishnu Narayan Mishra
Dr. Sankar Prasad Mondal
Prof. Charles L. Munson

Dr. Jamal Ouenniche
Prof. Joaquín Antonio Pacheco Bonrostro
Prof. Javier Ramirez Rodriguez

Prof. Bhaba R. Sarker

Prof. Renduchintala Raghavendra Kumar Sharma

Dr. Chunming (Victor) Shi Prof. Andranik Tangian Prof. Etsuji Tomita Prof. Delfim F. M. Torres Dr. Manish Verma Dr. Yu Amy Xia Dr. Gongxian Xu Dr. Shenghan Xu

Prof. Farouk Yalaoui Dr. Jiping Yang Dr. Shilei Yang Prof. Walid Tawfik You

Prof. Walid Tawfik Younes Mohamed

Dr. Xiaohang Yue Prof. Zike Zhang

Subject Coverage

This journal invites original research and review papers that address the following issues in operations research. Topics of interest include, but are not limited to:

1. Operations Research and Optimization Theory and Research Technical Approaches

Computational Intelligence and Information Management

Continuous Optimization

Decision Support Systems, Multi-Criteria Decision Methods

Discrete Optimization

Expert Systems

Heuristics Mathematical Programming

Networks

Queues

Simulation

Stochastic Models and Statistics

Time Series Analysis

2. Manufacturing and Service Operations Research

Forecasting Inventory Location

Logistics, Transportation Warehousing and Maintenance

Planning and Scheduling

Product and Service Design

Project Management
Quality Management
Revenue Management
Supply Chain Management

3. Interfaces with Other Disciplines

Community Operations Research

Complex Systems

Education Operations Research

Environmental and Energy Issues

Financial Engineering

Government Operations Research

Health Services Operations Research

Marketing Science

Military and Homeland Security

Operations Research in Nonprofit Organization

Policy Modeling and Public Sector OR

Productivity and Efficiency in the Public Sector

Sports Operations Research

Telecommunications and Networking

E-mail: ajor@scirp.org

We are also interested in short papers (letters) that clearly address a specific problem, and short survey or position papers that sketch the results or problems on a specific topic. Authors of selected short papers would be invited to write a regular paper on the same topic for future issues of the AJOR.

Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

Website and E-mail

https://www.scirp.org/journal/ajor

What is SCIRP?

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

What is Open Access?

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, worldwide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience





Website: https://www.scirp.org Subscription: sub@scirp.org Advertisement: service@scirp.org