

Table of Contents

International Journal of Swarm Intelligence Research

Volume 12 • Issue 4 • October-December-2021 • ISSN: 1947-9263 • eISSN: 1947-9271

RESEARCH ARTICLES

- 1 **Automatic Face Emotion Recognition With the Aid of Probability-Based Bird Swarm-Trained Neural Network**
Bhagyashri Devi, Noorul Islam Centre for Higher Education, India
M. Mary Synthuja Jain Preetha, Noorul Islam Centre for Higher Education, India

- 25 **Particle Swarm Optimization in Bioinformatics, Image Processing, and Computational Linguistics**
Badal Soni, National Institute of Technology, Silchar, India
Satashree Roy, National Institute of Technology, Silchar, India
Shiv Warsi, National Institute of Technology, Silchar, India

- 45 **Collective Strategies With a Master-Slave Mechanism Dominate in Spatial-Iterated Prisoner's Dilemma**
Jiawei Li, University of Nottingham, Ningbo, China
Robert Duncan, University of Stirling, UK
Jingpeng Li, University of Stirling, UK
Ruibin Bai, University of Nottingham, Ningbo, China

- 57 **An Efficient Regression Test Suite Optimization Approach Using Hybrid Spider Monkey Optimization Algorithm**
Arun Prakash Agrawal, Sharda University, India
Ankur Choudhary, Sharda University, India
Parma Nand, Sharda University, India

- 81 **Adaptive Grouping Brain Storm Optimization for Multimodal Optimization Problems**
Yao Peng, Beihang University, China
Zepeng Shen, Beihang University, China
Shiqi Wang, Beihang University, China

- 101 **A Discrete Crow Search Algorithm for Mining Quantitative Association Rules**
Makhlouf Ledmi, Abbes Laghrour University of Khenchela, Algeria & Batna 2 University, Algeria
Hamouma Moumen, Batna 2 University, Algeria
Abderrahim Siam, Abbes Laghrour University of Khenchela, Algeria
Hichem Haouassi, Abbes Laghrour University of Khenchela, Algeria
Nabil Azizi, Abbes Laghrour University of Khenchela, Algeria

- 125 **A Reliable Behavioral Model: Optimizing Energy Consumption and Object Clustering Quality by Naïve Robots**
Wafa Aouadj, LaSTIC Laboratory, Batna 2 University, Algeria
Mohamed-Rida Abdessemed, LaSTIC Laboratory, Batna 2 University, Algeria
Rachid Seghir, LaSTIC Laboratory, Batna 2 University, Algeria

- 146 **Hybrid Multi-Population and Adaptive Search Range Strategy With Particle Swarm Optimization for Multimodal Optimization**
Shiqi Wang, Beihang University, China
Zepeng Shen, Beihang University, China
Yao Peng, Beihang University, China

- 169 **Biomedical Document Clustering Based on Accelerated Symbiotic Organisms Search Algorithm**
Saida Ishak Boushaki, Computer Science Department, University M'Hammed Bouguera of Boumerdès, Algeria
Omar Bendjeghaba, LREEI, University M'hammed Bouguera of Boumerdes, Algeria
Nadjet Kamel, LRSD, Computer Science Department, Ferhat Abbas University Setif 1, Algeria

- 186 **Multi-Objective Artificial Bee Colony Algorithm for Parameter-Free Neighborhood-Based Clustering**
Fatima Boudane, LIMOSE Laboratory, Department of Computer Science, University M'Hamed Bougara of Boumerdes, Algeria
Ali Berrichi, LIMOSE Laboratory, Department of Computer Science, University M'Hamed Bougara of Boumerdes, Algeria

Copyright

The *International Journal of Swarm Intelligence Research (IJSIR)* (ISSN 1947-9263; eISSN 1947-9271), Copyright © 2021 IGI Global. All rights, including translation into other languages reserved by the publisher. No part of this journal may be reproduced or used in any form or by any means without written permission from the publisher, except for noncommercial, educational use including classroom teaching purposes. Product or company names used in this journal are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark. The views expressed in this journal are those of the authors but not necessarily of IGI Global.

The *International Journal of Swarm Intelligence Research* is indexed or listed in the following: ACM Digital Library; Bacon's Media Directory; Cabell's Directories; DBLP; Google Scholar; INSPEC; JournalTOCs; MediaFinder; SCOPUS; The Standard Periodical Directory; UGC-CARE List (India); Ulrich's Periodicals Directory; Web of Science; Web of Science Emerging Sources Citation Index (ESCI)