ISSN: 2150-8402



Journal of Intelligent Learning Systems and Applications



Journal Editorial Board

ISSN Print: 2150-8402 ISSN Online: 2150-8410

http://www.scirp.org/journal/jilsa

Editors-in-Chief

Dr. Steve S. H. Ling
University of Technology Sydney, Australia
Prof. Xin Xu
National University of Defense Technology, China

Editorial Advisory Board

Prof. Haibo He University of Rhode Island, USA

Prof. Rob Law Hong Kong Polytechnic University, China

Prof. Yi Pan Georgia State University, USA

Editorial Board (According to Alphabet)

Prof. Tao Ban National Institute of Information and Communications Technology, Japan

Prof. Mokhtar Beldjehem University of Ottawa, Canada
Dr. Vitoantonio Bevilacqua Polytechnic of Bari, Italy

Dr. Rifai Chai University of Technology, Sydney, Australia

Dr. Kit Yan Chan Curtin University, Australia

Dr. Peng Chen Chinese Academy of Sciences, China

Prof. Hengda Cheng Utah State University, USA

Dr. Ying Guo Commonwealth Scientific and Industrial Research Organization, Australia

Prof. Kao-Shing HwangNational Sun Yat-sen University, Chinese TaipeiDr. Frank JiangUniversity of New South Wales, AustraliaDr. Michail G. LagoudakisTechnical University of Crete, Greece

Dr. Hak-Keung LamKing's College London, UKProf. Shutao LiHunan University, ChinaProf. Yiguang LiuSichuan University, China

Prof. Kin Huat Low Nanyang Technological University, Singapore

Dr. Vincenzo PacelliUniversity of Foggia, ItalyProf. George PanayiotakisUniversity of Patras, GreeceProf. Yong QinBeijing Jiaotong University, China

Dr. Phyo Phyo SanNanyang Technological University, SingaporeProf. Steven Weidong SuUniversity of Technology Sydney, Australia

Prof. Theodore B. TrafalisThe University of Oklahoma, USAProf. Evangelos TriantaphyllouLouisiana State University, USADr. Jue WangChinese Academy of Sciences, China

Prof. Xuesong Wang China University of Mining and Technology, China

Prof. Simon X. Yang
University of Guelph, Canada
Prof. Shi Ying
Wuhan University, China
Dr. Yudong Zhang
Columbia University, USA

Dr. Yi Zhao Harbin Institute of Technology Shenzhen Graduate School, China

Prof. Wei ZhongUniversity of South Carolina Upstate, USAProf. Dingxuan ZhouCity University of Hong Kong, China

Prof. Antanas Zilinskas Institute of Mathematics and Informatics, Lithuania



ISSN Online: 2150-8410 ISSN Print: 2150-8402

Table of Contents

Volume 9	Number 3	August 2017
Classification I	Based on Invariants of the Data Matrix	
V. N. Shats		35

Journal of Intelligent Learning Systems and Applications (JILSA) Journal Information

SUBSCRIPTIONS

The *Journal of Intelligent Learning Systems and Applications* (Online at Scientific Research Publishing, <u>www.SciRP.org</u>) is published quarterly by Scientific Research Publishing, Inc., USA.

Subscription rates:

Print: \$89 per copy.

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 © 2017 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 © 2017 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: jilsa@scirp.org



Journal of Intelligent Learning Systems and Applications

ISSN Print: 2150-8402 ISSN Online: 2150-8410

http://www.scirp.org/journal/jilsa

The *Journal of Intelligent Learning Systems and Applications* (JILSA) is a peer reviewed international journal with a key objective to provide the academic and industrial community a medium for presenting original cutting-edge research related to intelligent learning systems and their applications. JILSA invites authors to submit their original and unpublished work that communicates current research on intelligent learning systems both in the theoretical and methodological aspects, as well as various applications in real-world applications.

Papers are invited on the topics including, but not limited to:

- Approximate Dynamic Programming
- Autonomic Computing
- Autonomous Learning Systems
- Bio-Inspired Learning Method
- Clustering
- Cyber-Physical Systems
- Evolutionary Computation
- Filter Bank
- Fuzzy and Rough Set
- General Theory on Intelligent Learning Systems
- Intelligent Applications
- Learning Control Systems
- Multi-Agent Learning
- Multiple Models Strategy

- Neural Networks
- Pattern Recognition Based on Learning Techniques
- Predictive Control
- Recommendation System
- Reinforcement Learning
- Robotics
- Smart Grid Techniques and Applications
- Social Network Analysis
- Statistical Learning Theory
- Supervised Learning
- Time-Frequency Representation

E-Mail: jilsa@scirp.org

- Unsupervised Learning
- User Behavior Modelling
- Wavelet Theory

Editors-in-Chief

Dr. Steve S. H. Ling University of Technology Sydney, Australia

Prof. Xin Xu National University of Defense Technology, China

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

http://www.scirp.org/journal/jilsa

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: http://www.scirp.org Subscription: sub@scirp.org Advertisement: service@scirp.org