EXPERT SYSTEMS WITH APPLICATIONS
An International Journal

AUTHOR INFORMATION PACK

TABLE OF CONTENTS

- Description p.1
- Audience p.2
- Abstracting and Indexing p.2
- Editorial Board p.2
- Guide for Authors p.10

DESCRIPTION

Expert Systems With Applications is a refereed international journal whose focus is on exchanging information relating to expert and intelligent systems applied in industry, government, and universities worldwide. The thrust of the journal is to publish papers dealing with the design, development, testing, implementation, and/or management of expert and intelligent systems, and also to provide practical guidelines in the development and management of these systems. The journal will publish papers in expert and intelligent systems technology and application in the areas of, but not limited to: finance, accounting, engineering, marketing, auditing, law, procurement and contracting, project management, risk assessment, information management, information retrieval, crisis management, stock trading, strategic management, network management, telecommunications, space education, intelligent front ends, intelligent database management systems, medicine, chemistry, human resources management, human capital, business, production management, archaeology, economics, energy, and defense. Papers in multi-agent systems, knowledge management, neural networks, knowledge discovery, data and text mining, multimedia mining, and genetic algorithms will also be published in the journal.

Reproducibility Badge Initiative and Software Publication

Reproducibility Badge Initiative (RBI) is a collaboration with Code Ocean (CO), a cloud based computational reproducibility platform that helps the community by enabling sharing of code and data as a resource for non-commercial use. CO verifies the submitted code (and data) and certifies its reproducibility. Code submission will be verified by the Code Ocean team for computational reproducibility by making sure it runs, delivers results and it is self-contained. For more information please visit this help article. Note that an accepted paper will be published independently of the CO application outcome. However, if the paper receives the Reproducibility badge, it will be given additional exposure by having an attached R Badge, and by being citable at the CO website with a DOI.

We invite you to convert your open source software into an additional journal publication in Software Impacts, a multi-disciplinary open access journal. Software Impacts provides a scholarly reference to software that has been used to address a research challenge. The journal disseminates impactful and re-usable scientific software through Original Software Publications which describe the application of the software to research and the published outputs.

For more information contact us at: software.impacts@elsevier.com

Benefits to authors

AUTHOR INFORMATION PACK 31 Aug 2023 www.elsevier.com/locate/eswa
We also provide many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications and much more. Please click here for more information on our author services.

Please see our Guide for Authors for information on article submission. If you require any further information or help, please visit our Support Center

AUDIENCE

Knowledge Engineers, Managers, Systems Engineers, Automation and Control Engineers, Electronic and Electrical Engineers.

ABSTRACTING AND INDEXING

Cambridge/Computer and Information Abstracts
Academic Journal Guide (Chartered Association of Business Schools)
Web of Science
Research Alert
Current Contents - Engineering, Computing & Technology
Science Citation Index Expanded
Scopus
INSPEC

EDITORIAL BOARD

Editor-in-Chief
Binshan Lin, Louisiana State University in Shreveport, Shreveport, Louisiana, United States of America

Editors
Dragi Kocev, Jozef Stefan Institute, Ljubljana, Slovenia
Ensemble Learning, Structured Output Prediction, Semi-supervised Learning, Feature Selection, Earth Observation, Benchmarking in AI
Sabrina Senatore, University of Salerno, Fisciano, Italy
Semantic Web, Computational Intelligence, Artificial Intelligence
Joaquín Torres-Sospedra, Centro Algoritmi, Universidade do Minho, Azurém, Portugal
Ling Wang, Tsinghua University, Department of Automation, Beijing, China
Evolutionary computation, Swarm intelligence, Scheduling, Optimization

Founding Editor
Jay Liebowitz, University of Maryland Global Campus, Adelphi, Maryland, United States of America

Associate Editors
Azim Ahmadzadeh, Georgia State University, Atlanta, Georgia, United States of America
Data Science, Data Mining, Machine Learning, Model Evaluation, Time Series, Image Processing
Roohallah Alizadehsani, Deakin University - Geelong Waurn Ponds Campus, Waurn Ponds, Victoria, Australia
Machine learning, deep learning, computer vision, application of machine learning in disease diagnosis, Data science
Diego Raphael Amancio, University of Sao Paulo, Department of Computer Science, SÃO CARLOS, Brazil
Expert and Intelligent Systems, Knowledge-based Systems, Pattern recognition, Machine learning, Data science, Natural language processing, Intelligent systems and AI in engineering, Intelligent systems and AI in business and social science, Intelligent systems and AI in Medicine, Intelligent systems and AI in Biology, Complex Networks, Graphs, Network Science, Scientometrics, Science of Science
Saman Hassanzadeh Amin, Toronto Metropolitan University, Department of Mechanical and Industrial Engineering, Toronto, Ontario, Canada
Optimization, Supply chain management, Operations Research
Karl Andersson, Lulea University of Technology, Luleå, Sweden
Expert systems, Machine Learning, Decision Support Systems, Blockchain technology, Wireless Networks

Juan Gabriel Avina-Cervantes, University of Guanajuato, Guanajuato, Mexico
Computer Vision, Robotics, Control Systems, Fractional Calculus, Optimization systems

Ahmed Azab, University of Windsor, Department of Mechanical, Automotive and Materials Engineering, Windsor, Ontario, Canada
Expert and Intelligent Systems, Decision support systems, prediction systems and early warning systems, Data driven optimization, Algorithm, Fuzzy system, Soft computing, Intelligent systems and AI in engineering

Erfan Babaee Tirkolaee, Istinye University, Istanbul, Turkey
Sustainable Supply Chain Management, Waste Management Systems, Logistics and Transportation Systems, Decision Support Systems, Mathematical Programming and Optimization

Sambit Bakshi, National Institute of Technology Rourkela, Rourkela, India
Biometrics, Surveillance, Forensics, Video analytics, Medical imaging

Denis Borenstein, Federal University of Rio Grande do Sul, PORTO ALEGRE, Brazil

Vincent Boyer, Autonomous University of Nuevo Leon, San Nicolas de los Garza, Mexico
Operations Research, Meta-heuristics, Integer Programming, Scheduling Problem, Vehicle routing Problem, Heuristics

Luca Cagliero, Polytechnic of Turin, Department of Control and Computer Engineering, Torino, Italy
Natural Language Processing, Machine Learning, Data Science

Haipeng Cai, Washington State University, Pullman, Washington, United States of America
Software systems, Program analysis, Software security

M. Emre Celebi, University of Central Arkansas, Conway, Arkansas, United States of America
Medical image analysis, Color image processing, Data clustering

Tania Cerquitelli, Polytechnic of Turin, Department of Control and Computer Engineering, Torino, Italy
Data science, Machine learning, Industry 4.0, Applied data science, Explainable artificial intelligence, Concept-drift management, Deep learning, Natural language processing

Bharathi Raja Chakravarthi, University of Galway, Galway, Ireland
Natural Language Processing, Multimodal Machine Learning, Hate Speech Detection, Dravidian Languages, Low-resource languages, Equality Diversity and Inclusion, Social Computing, Language resources and evaluation, Fake news detection, Sentiment analysis, Opinion Mining

Vincent Charles, Pontifical Catholic University of Peru CENTRUM Graduate Business School, Lima, Peru
Management Science, Artificial Intelligence, Data Science, Big Data

Kwok-wing Chau, The Hong Kong Polytechnic University, Department of Civil and Environmental Engineering, Hong Kong, Hong Kong
Machine learning, Neural networks and neurocomputing, Data driven optimization, Intelligent systems and AI in engineering

Chao-Yang Chen, Hunan University of Science and Technology, Xiangtan, China
Networked system and its application, multi-agent systems collaborative control, Adaptive Neural Network Control

Shi Cheng, Shaanxi Normal University School of Computer Science, Xian, China
Swarm Intelligence, Evolutionary Computation, Intelligent computing, Scheduling, Swarm Learning

Kwai-Sang Chin, City University of Hong Kong, Department of Systems Engineering and Engineering Management, Hong Kong, Hong Kong
Decision Support Systems, Management Intelligence, Quality and Engineering Management

Marcin Ciecholewski, Gdańsk University of Technology, Faculty of Electronics Telecommunications and Informatics, Gdansk, Poland
Computer Vision and Image Processing, Image Segmentation, Medical Image Analysis, Pattern Recognition, Remote Sensing

Sumali Conlon, University of Mississippi, Department of Management Information Systems, University, Mississippi, USA
Business intelligence, Expert and Intelligent Systems, Machine learning, Data science, Natural language processing, Intelligent systems and AI in Business

Erik Cuevas, University of Guadalajara, Guadalajara, Mexico
Metaheuristics, Agent-based systems, I processing, Machine learning

Pierpaolo D'Urso, University of Rome La Sapienza, Department of Social and Economic Sciences, Roma, Italy
fuzzy clustering, clustering of spatial data, clustering of time series, clustering of spatio-temporal data, clustering of complex structures of data, imprecise data science

Dursun Delen, Oklahoma State University, Spears School of Business, Department of Management Science and Information Systems, Stillwater, Oklahoma, United States of America and Istinye University, Faculty of Engineering and Natural Sciences, Department of Industrial En, Istanbul, Turkey
Data science, Business analytics, Predictive modeling, Clinical decision support systems, AI in medicine, Decision Support Systems, Data Mining and Text Mining, Artificial Intelligence and Machine Learning

**Konstantinos Demertzis**, Hellenic Open University Schools of Science & Technology, Patra, Greece
AI Cybersecurity, AI Big Data, AI Blockchain, MLOps, Geo AI

**Zhi-Hong Deng**, Peking University School of Electronics Engineering and Computer Science, Beijing, China
Machine learning, Natural language processing, Data mining

**Muhammet Deveci**, Royal School of Mines, London, United Kingdom
Fuzzy Multi-Criteria Decision Making, Fuzzy Sets and Systems, Decision Support Systems, Computational Intelligence

**Debora Di Caprio**, University of Trento, Department of Economics and Management, Trento, Italy

**Giorgio Maria Di Nunzio**, University of Padua, Department of Information Engineering, Padova, Italy
Interactive Machine Learning, Visual Data Mining, Information Retrieval Theory, Big Data, Linked Open Data, Digital Geolinguistics

**Sofia Balula Dias**, Lisbon, Portugal
Intelligent Learning Management Systems, Artificial Intelligence, Serious Games, Blended-Learning, Fuzzy Logic, Deep Learning, Higher Education, Exergames, Affective learning, Collaborative learning, Online learning

**Rebeca Díaz Redondo**, University of Vigo School of Telecommunications Engineering, Vigo, Spain

**Leandro Dos Santos Coelho**, Pontifical Catholic University of Parana, CURITIBA, Brazil
Machine learning, Deep learning, Evolutionary algorithms, Forecasting, Regression

**Anastasios Doulamis**, National Technical University of Athens, School of Rural, Surveying and Geoinformatics Engineering, Athens, Greece
Computer vision, Deep learning, Image analysis, Artificial intelligence

**Tome Eftimov**, Jozef Stefan Institute, Ljubljana, Slovenia
Machine learning, Evolutionary computation, Meta-learning, Natural language processing, Statistics

**Jan Egger**, University Hospital Essen, Essen, Germany
Augmented Reality/Virtual Reality/Mixed Reality/Diminishing Reality/Medical Deep Learning

**Ugo Erra**, University of Basilicata, Department of Mathematics Computer Science and Economics, Potenza, Italy
Computer Graphics, Information Visualization, Virtual and Augmenting Reality and Artificial Intelligence

**Marta Campos Ferreira**, University of Porto, Department of Industrial Engineering and Management, Porto, Portugal
Data science, Big data analytics, Multi-criteria decision-making, Human computer interaction, Intelligent transport systems

**Elisabetta Fersini**, University of Milan-Bicocca, Department of Informatics Systems and Communication, Milano, Italy
Machine Learning, Natural Language Processing, Data Science, Graph representation learning

**Iztok Jr Fister**, University of Maribor, Maribor, Slovenia
Computational intelligence, Data mining, Sport, Swarm intelligence

**C. Bryan Foltz**, The University of Tennessee at Martin, College of Business and Global Affairs, Martin, Tennessee, United States of America
Information Systems Security, Privacy, Web Development

**Agostino Forestiero**, National Research Council, Roma, Italy
Computational Intelligence, eHealth, Internet of Things, Cybersecurity, swarm intelligence, explainable AI, Internet of Things, multi-agent systems

**Stephen Andrew Gadsden**, McMaster University, Department of Mechanical Engineering, Hamilton, Ontario, Canada
Artificial intelligence, cognitive systems, estimation, machine learning, mechatronics

**Kaizhou Gao**, Macau Institute of Systems Engineering, Macau, Macao
Intelligent Optimization and Scheduling, Meta-heuristics, Soft Computing, Intelligent Transportation, reinforcement learning

**Paolo Garza**, Polytechnic of Turin, Department of Control and Computer Engineering, Torino, Italy
Data Science, Machine Learning, Big Data Analytics, Natural Language Processing

**Antonios Gasteratos**, Democritus University of Thrace, Komotini, Greece
Computer vision, Robotics, Machine learning

**Adam Glowacz**, AGH University of Science and Technology, Krakow, Poland
Fault diagnosis, thermal imaging, image processing, acoustic, vibration analysis

Wenyin Gong, China University of Geosciences, Wuhan, China
Evolutionary Computation, Intelligent Scheduling, Intelligent Optimization

Francisco González Castaño, University of Vigo, Department of Telematic Engineering, Vigo, Spain
Intelligent networks, natural language processing, machine learning

Patricia González, University of A Coruna, A Coruña, Spain
Algorithms, Modelling, Optimization, High Performance Computing

Feng Gu, CUNY The Graduate Center, Department of Computer Science, Staten Island, New York, United States of America
Modeling and simulation, Machine learning, High performance computing

Francisco Guijarro, Polytechnic University of Valencia, Valencia, Spain
Business Intelligence, Trading Rules, Portfolio Management, Valuation

Yanhui Guo, University of Illinois Springfield, Department of Computer Science, Springfield, Illinois, United States of America
Computer Vision, Image Processing, Artificial Intelligence, Machine Learning, Cybersecurity

Mostafa Hajiaghaei-Keshteli, Technological and Higher Education Institute of Monterrey, School of Engineering and Sciences, Monterrey, Mexico
Supply Chain Optimization, Metaheuristics, Multi-Criteria Decision-Making, Sustainable Smart Logistics, Healthcare Supply Chain

Jin-Kao Hao, University of Angers, Department of Mathematics and Computer Science, Angers, France
Combinatorial Optimization, Metaheuristics, Large Scale Optimization, Applications

Elena Hernandez-Pereira, Universidade da Coruna, Faculty of Computer Science, A Coruna, Spain
Machine Learning, Deep Learning, Graph Learning, Decision Support Systems, Knowledge-based Systems, Data science, Intelligent systems in Medicine.

Alessio Ishizaka, NEOMA Business School, Mont St Aignan, France
Decision Analysis, Decision Support Systems, Decision Analytics, Optimization, Mathematical Programming

Soo-Youn Ji, Bowie State University, College of Arts and Sciences Department of Computer Science, Bowie, Maryland, United States of America
Data Science, Biomedical Informatics, Emotion Detection, Intrusion Detection, Data analytics, Pattern Recognition

Aleksandra Rashkovska Koceva, Jožef Stefan Institute, Department of Communication Systems, Ljubljana, Slovenia
Intelligent systems and AI in Medicine, Data science, ECG analysis

Werner Kristjanpoller, Federico Santa Maria Technical University, Valparaiso, Chile
Quantitative finance, Stock market forecasting, Investment strategy, Hybrid models, Neural networks, Fuzzy systems, Deep learning (time series), Decision-support systems, Fractals applications.

Xinyu Li, Huazhong University of Science and Technology, Wuhan, Hubei, China
Machine learning, Data driven optimization, Soft computing, Intelligent systems and AI in engineering, Scheduling

Salim Lahmiri, Concordia University, John Molson School of Business, Department of Supply Chain and Business Technology Management, Montréal, Quebec, Canada
Data science, Data analytics, Signal processing, Intelligent systems, Pattern recognition, Deep learning and real-world applications, Applications of chaos theory and fractals, Image processing, Speech recognition, Forecasting, Artificial Intelligence, Predictive Analytics

Eduardo Lalla-Ruiz, University of Twente, IEBIS, Department of High-Business Entrepreneurship, Enschede, Netherlands
Optimization algorithms, Operations Research, Mathematical Programming, Transportation and Logistics Management, Vehicle Routing, Maritime Logistics

Hoi-Yan Lam, The Hang Seng University of Hong Kong, Department of Supply Chain and Information Management, Hong Kong, Hong Kong
Decision support systems, business intelligence, e-commerce logistics, data analytics in supply chain management

Alessandro Lameiras Koerich, École de technologie supérieure, Montréal, Quebec, Canada
Machine Learning, Computer Vision, Music Information Retrieval, Affective Computing

Chunping Li, Tsinghua University, School of Software, Beijing, China
Artificial Intelligence, Data Analysis and Data Mining, Machine Learning and Automated Reasoning

Jinqing Li, Shandong Normal University, China
Scheduling, swarm intelligent optimization, optimization algorithm, computational intelligence, multi-objective optimization

Xiang Li, Xi'an Jiaotong University, Xian, China
<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yannan Li</td>
<td>University of Wollongong School of Computing and Information Technology, Wollongong, Australia</td>
</tr>
<tr>
<td>Gilbert Y. S. Lim</td>
<td>Singapore Eye Research Institute, Singapore, Singapore</td>
</tr>
<tr>
<td>Kuo-Ping Lin</td>
<td>Tunghai University, Department of Industrial Engineering and Enterprise Information, Taichung, Taiwan</td>
</tr>
<tr>
<td>Julio López</td>
<td>Diego Portales University, Faculty of Engineering and Sciences, Santiago, Chile</td>
</tr>
<tr>
<td>Huifang Ma</td>
<td>Northwest Normal University, Lanzhou, China</td>
</tr>
<tr>
<td>Simona Mancini</td>
<td>University of Palermo, Palermo, Italy</td>
</tr>
<tr>
<td>Viviana Cocco Mariani</td>
<td>Federal University of Parana, CURITIBA, Brazil</td>
</tr>
<tr>
<td>Mario J. Martin-Bautista</td>
<td>University of Granada, Department of Computer Science and Artificial Intelligence, Granada, Spain</td>
</tr>
<tr>
<td>Luis Martinez-López</td>
<td>University of Jaen, Department of Computer Science, Jaen, Spain</td>
</tr>
<tr>
<td>Ernestina Menasalvas Ruiz</td>
<td>Universidad Politecnica de Madrid, Computer Science School, Madrid, Spain</td>
</tr>
<tr>
<td>Heydi Méndez-Vázquez</td>
<td>Advanced Technologies Application Centre, La Habana, Cuba</td>
</tr>
<tr>
<td>Luis Martinez-Gil</td>
<td>Software Competence Center Hagenberg GmbH, Hagenberg, Austria</td>
</tr>
<tr>
<td>Luis Martinez-López</td>
<td>University of Jaen, Department of Computer Science, Jaen, Spain</td>
</tr>
<tr>
<td>Luis Nanni</td>
<td>University of Padua, Department of Information Engineering, Padova, Italy</td>
</tr>
<tr>
<td>Michele Nappi</td>
<td>University of Salerno, Fisciano, Italy</td>
</tr>
<tr>
<td>Oscar Montiel Ross</td>
<td>National Polytechnic Institute, Ciudad de México, Mexico</td>
</tr>
<tr>
<td>Vincenzo Moscato</td>
<td>University of Naples Federico II, Napoli, Italy</td>
</tr>
<tr>
<td>Loris Nanni</td>
<td>University of Padua, Department of Information Engineering, Padova, Italy</td>
</tr>
<tr>
<td>Pedro Neto</td>
<td>University of Coimbra, Department of Mechanical Engineering, Coimbra, Portugal</td>
</tr>
<tr>
<td>Rui Neves</td>
<td>University of Lisbon Higher Technical Institute, Lisboa, Portugal</td>
</tr>
<tr>
<td>Luiz Eduardo de Oliveira</td>
<td>Federal University of Parana, CURITIBA, Brazil</td>
</tr>
<tr>
<td>Ana Carolina Olivera</td>
<td>National University of Cuyo, Mendoza, Argentina</td>
</tr>
<tr>
<td>Shivakumara Palaihnakote</td>
<td>University of Malaya, Faculty of Computer Science and Information Technology, Kuala Lumpur, Malaysia</td>
</tr>
<tr>
<td>Joanna Paliszkiewicz</td>
<td>Warsaw University of Life Sciences Management Institute, Warszawa, Poland</td>
</tr>
<tr>
<td>Joanna Paliszkiewicz</td>
<td>Warsaw University of Life Sciences Management Institute, Warszawa, Poland</td>
</tr>
<tr>
<td>Dragan Pamucar</td>
<td>University of Belgrade, Faculty of Organisational Sciences, Belgrade, Serbia</td>
</tr>
</tbody>
</table>

**Costas Panagiotakis**, Hellenic Mediterranean University, Irakleio, Greece
Signal processing, Computer vision, Multimedia, Pattern recognition, Recommender systems

**Kang Ryoung Park**, Dongguk University, Jung-gu, South Korea
Biometrics, Image recognition, Deep learning

**Zbigniew Pastuszak**, Maria Curie-Sklodowska University in Lublin, Faculty of Economics, Lublin, Poland
Business intelligence, Knowledge-based Systems, Data science, Decision support systems, prediction systems and early warning systems, Data driven optimization, Intelligent systems and AI in business & social science

**Gianvito Pio**, University of Bari Aldo Moro, Department of Informatics, Bari, Italy
Machine learning, Data mining, Bioinformatics, Transfer learning, Relational learning

**Dawid Polap**, Silesian University of Technology, Faculty of Applied Mathematics, Gliwice, Poland
Machine learning, Computational intelligence, Computer vision and image processing

**Radu-Emil Precup**, Politehnica University of Timisoara, Department of Automation and Applied Informatics, Timisoara, Romania
Control structures and algorithms (conventional control, Fuzzy control, Data-based control, model-free control, Sliding mode control, neuro-fuzzy control), Theory and applications of soft computing, Systems modelling, Identification and optimization (including nature-inspired algorithms), Computer-aided design of control system, Applications to mechatronics systems (including automotive systems and mobile robots, Embedded systems, Control of power plants, Servo systems, Electrical driving systems), Machine Learning in Healthcare, Artificial Intelligence in Healthcare, Data Mining, Big Data in Healthcare, Simulation in Healthcare

**Guanqiu Qi**, SUNY Buffalo State University, Buffalo, New York, United States of America
Deep learning, machine learning, image processing, big data, pattern recognition

**Joao Manuel R. S. Tavares**, University of Porto, Department of Mechanical Engineering, Porto, Portugal
Biomechanics, Medical Imaging, Computational Vision, Gait and Posture, Biodevices, Image Processing and Analysis, NDT

**Rahim Rahmani**, Stockholm University, Department of Computer and Systems Sciences, Kista, Sweden
Distributed IoT, Cognitive Edge Continuum, Tactile Internet, Blockchain, and Adversarial machine learning, artificial intelligence and optimization

**Imma Ribas Vila**, Polytechnic University of Catalonia, Barcelona, Spain
Urban logistics, Urban mobility, Scheduling, Supply Chain Management, Supply Chain Design

**Ricardo A. Rios**, Federal University of Bahia, Department of Computer Science, SALVADOR, Brazil
Machine learning, Data science, Neural networks and neurocomputing, Pattern recognition, Computer vision and image processing

**Frederic Ros**, University of Orléans, Orleans, France
Machine learning, Computer vision, Clustering, Watermarking

**Sriparna Sahais**, Indian Institute of Technology Patna, Patna, India
Machine Learning, Deep Learning, Natural Language Processing, Text Mining, Bioinformatics, Multiobjective optimization, Biomedical information extraction

**Silvia Schiaffino**, National University of the Center of Buenos Aires, Systems Research Institute of Tandil, Tandil, Argentina
Machine learning, Recommender systems, Knowledge representation and reasoning

**Lixin Shen**, Shenzhen University College of Computer Science & Software Engineering, Shenzhen, China
Computer Vision, Deep Learning, Facial Analysis, Medical Image Processing

**Maira da Silva**, University of Sao Paulo Sao Carlos School of Engineering, Sao Carlos, Brazil
Design and control of robotic systems, Optimization in engineering, Servovision, Multiphysics simulation, Sensor fusion, Machine learning

**Nikola Simidjevski**, University of Cambridge, Cambridge, United Kingdom
Machine Learning, Explainable AI, Physics-informed machine learning and equation discovery, ML/AI applications for space research, Integrative data analysis, ML applications in life sciences (medicine/biology/neuroscience)

**Guojie Song**, Peking University, Beijing, China
Data mining, Social network analysis, Intelligent transportation system

**Shaoxu Song**, Tsinghua University, Beijing, China
Data quality, data integration, data mining

**Giancarlo Sperlì**, University of Naples Federico II, Department of Electrical Engineering and Information Technology, Napoli, Italy
Social Network Analysis, Predictive maintenance, Cybersecurity, eHealth analytics, Multimedia Analytics, Anomaly Detection

**Xiaolei Sun**, Chinese Academy of Sciences Institutes of Science and Development, Beijing, China
Risk correlation modelling, risk analysis, decision making

Madjid Tavana, La Salle University, Philadelphia, Pennsylvania, United States of America
Decision Sciences and Decision Support Systems, Information Sciences and Systems Analysis, Data Science and Business Analytics, Supply Chain Analytics and Management, Space Mission Planning and Operations

Manoj Tiwari, National Institute of Industrial Engineering, Mumbai, India
Decision Support Models, Simulation Model, Computational Intelligence, Machine Learning, Supply Chain and Logistics, Manufacturing Systems,

Genoveffa Tortora, University of Salerno, Department of Informatics, Fisciano, Italy
Expert and Intelligent Systems, Machine learning, Pattern recognition, Data science, Human-Computer Interaction, Multimedia Database, Artificial Intelligence, Image processing

Evangelos Triantaphyllou, Louisiana State University, Baton Rouge, Louisiana, United States of America
Intelligent systems and AI in Medicine, Multi-criteria decision making (MCDM), Decision support systems, prediction systems and early warning systems, Data driven optimization, Computer Aided Diagnosis (CAD) in Medicine

Marcello Trovati, Edge Hill University, Department of Computer Science, Ormskirk, United Kingdom
Data Science, Artificial Intelligence, Natural Language Processing, Decision Systems

Ping Wang, James Madison University, Department of Computer Information Systems & Business Analytics, Harrisonburg, Virginia, United States of America
Supply Chain Management Models and Analysis, Structural Equation Modeling, Multivariate Analysis, Classification Problems

Rui Wang, National University of Defense Technology, Changsha, China
Evolutionary Computation, Multi-objective Optimization, Energy System, Data mining

Yan Wang, Tsinghua University, Beijing, China
Deep Learning, Computer Vision, Generative Model, Data Compression, AI Applications

Jaroslaw Wiatrowski, University of Szczecin, Szczecin, Poland
Multiple-criteria decision analysis (MCDA), Multiple-criteria decision-making (MCDM), Sustainability

Xiuli Wu, University of Science and Technology Beijing School of Mechanical Engineering, Hai Dian Qu, China
Job shop scheduling problem, Production scheduling problem, Vehicle routing problem, Meta-heuristics algorithm

Hua Xu, Tsinghua University, Department of Computer Science and Technology, Beijing, China
Natural Language Processing, Intelligent Optimization Algorithms, Intelligent Information Processing, Multimodal Information Processing and Mining

Hyung-Jeong Yang, Chonnam National University, Gwangju, South Korea
Artificial Intelligence, Multimodal Data Fusion, Medical Data Analysis, Emotion Recognition

Steve Yang, Stevens Institute of Technology Wesley J Howe School of Technology Management, Hoboken, New Jersey, United States of America
Microstructure, Behavioral Finance, Portfolio Optimization, Algorithmic Trading, Financial Systemic Risk

Samuel Yousefi, The University of British Columbia Okanagan School of Engineering, Kelowna, British Columbia, Canada
Supply Chain Management, AI in Business, Decision Support Systems, Risk and Uncertainty Analysis, Multi-Criteria Decision-Making, Blockchain Technology

Yong Yu, Shaanxi Normal University School of Computer Science, Xian, China
Blockchain technology, Cybersecurity, AI security, Data Security, Privacy

Haitao Yuan, Beihang University, Beijing, China
Expert and intelligent systems, machine learning, data driven optimization, prediction systems and early warning systems, deep learning, data science, big data, optimization algorithms, cloud computing, edge computing, data centers

Fangfang Zhang, Victoria University of Wellington, Wellington, New Zealand
Evolutionary computation, Genetic programming, Combinatorial Optimisation, Scheduling, Routing

Heye Zhang, Sun Yat-Sen University, Guangzhou, China
Machine learning, Health information computing, Medical image processing

Sen Zhang, University of Science and Technology Beijing, School of Automation and Electrical Engineering, Beijing, China
Machine learning, intelligent modeling and control

Wen-Jun (Chris) Zhang, University of Saskatchewan, Department of Mechanical Engineering, Saskatoon, Saskatchewan, Canada
Data modeling, Informatics, Robotics, Image Processing, Inference, Decision making, Sensor, Group robotics, Resilience and sustainability, Biomedical science, Technology, and engineering

Zheng Zhang, Harbin Institute of Technology Shenzhen School of Computer Science and Technology, Shenzhen, China
Multi-modal Machine Learning, Multimedia Content Analysis, Big Data Mining
Hai Zhuge, Aston University Computer Science, Birmingham, United Kingdom
Knowledge representation, Semantic Link Network, Resource Space Model, Knowledge Flow Network
GUIDE FOR AUTHORS

INTRODUCTION
EXPERT SYSTEMS WITH APPLICATIONS is a refereed international journal whose focus is on exchanging information relating to expert and intelligent systems applied in industry, government, and universities worldwide. The thrust of the journal is to publish papers dealing with the design, development, testing, implementation, and/or management of expert and intelligent systems, and also to provide practical guidelines in the development and management of these systems.

Types of Paper
The journal will publish papers in expert and intelligent systems technology and application in the areas of, but not limited to: finance, accounting, engineering, marketing, auditing, law, procurement and contracting, project management, risk assessment, information management, information retrieval, crisis management, stock trading, strategic management, network management, telecommunications, space education, intelligent front ends, intelligent database management systems, medicine, chemistry, human resources management, human capital, business, production management, archaeology, economics, energy, and defense. Papers in multi-agent systems, knowledge management, neural networks, knowledge discovery, data and text mining, multimedia mining, and genetic algorithms will also be published in the journal.

Contact Details for Submission
Authors are requested to submit their original papers using the submission website. To submit your paper online, please go to https://www.editorialmanager.com/eswa/Default.aspx. Authors interested in online submission are requested to go to the website and upload their manuscript and its associated artwork. An electronic (PDF) proof is generated and the reviewing process is carried out using that PDF. The PDF file may be edited after acceptance to follow journal standards. Authors and editors send and receive all correspondence by email via the website and no paper correspondence is performed.

For the name and address of the editor-in-chief, please refer to the list of editors in each issue of the journal or on the journal's homepage.

Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
• E-mail address
• Full postal address

All necessary files have been uploaded:
Manuscript:
• Include keywords
• All figures (include relevant captions)
• All tables (including titles, description, footnotes)
• Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)

Further considerations
• Manuscript has been 'spell checked' and 'grammar checked'
• All references mentioned in the Reference List are cited in the text, and vice versa
• Permission has been obtained for use of copyrighted material from other sources (including the Internet)
• A competing interests statement is provided, even if the authors have no competing interests to declare
• Journal policies detailed in this guide have been reviewed
• Referee suggestions and contact details provided, based on journal requirements
BEFORE YOU BEGIN

Ethics in publishing
Please see our information on Ethics in publishing.

Declaration of competing interest
Corresponding authors, on behalf of all the authors of a submission, must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. All authors, including those without competing interests to declare, should provide the relevant information to the corresponding author (which, where relevant, may specify they have nothing to declare). Corresponding authors should then use this tool to create a shared statement and upload to the submission system at the Attach Files step. Please do not convert the .docx template to another file type. Author signatures are not required.

Declaration of generative AI in scientific writing
The below guidance only refers to the writing process, and not to the use of AI tools to analyse and draw insights from data as part of the research process.

Where authors use generative artificial intelligence (AI) and AI-assisted technologies in the writing process, authors should only use these technologies to improve readability and language. Applying the technology should be done with human oversight and control, and authors should carefully review and edit the result, as AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. AI and AI-assisted technologies should not be listed as an author or co-author, or be cited as an author. Authorship implies responsibilities and tasks that can only be attributed to and performed by humans, as outlined in Elsevier's AI policy for authors.

Authors should disclose in their manuscript the use of AI and AI-assisted technologies in the writing process by following the instructions below. A statement will appear in the published work. Please note that authors are ultimately responsible and accountable for the contents of the work.

Disclosure instructions
Authors must disclose the use of generative AI and AI-assisted technologies in the writing process by adding a statement at the end of their manuscript in the core manuscript file, before the References list. The statement should be placed in a new section entitled ‘Declaration of Generative AI and AI-assisted technologies in the writing process’.

Statement: During the preparation of this work the author(s) used [NAME TOOL / SERVICE] in order to [REASON]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

This declaration does not apply to the use of basic tools for checking grammar, spelling, references etc. If there is nothing to disclose, there is no need to add a statement.

Submission declaration and verification
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see ‘Multiple, redundant or concurrent publication’ for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify compliance, your article may be checked by Crossref Similarity Check and other originality or duplicate checking software.

Preprints
Please note that preprints can be shared anywhere at any time, in line with Elsevier's sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see ‘Multiple, redundant or concurrent publication’ for more information).
**Preprint posting on SSRN**

In support of Open Science, this journal offers its authors a free preprint posting service. Preprints provide early registration and dissemination of your research, which facilitates early citations and collaboration.

During submission to Editorial Manager, you can choose to release your manuscript publicly as a preprint on the preprint server SSRN once it enters peer-review with the journal. Your choice will have no effect on the editorial process or outcome with the journal. Please note that the corresponding author is expected to seek approval from all co-authors before agreeing to release the manuscript publicly on SSRN.

You will be notified via email when your preprint is posted online and a Digital Object Identifier (DOI) is assigned. Your preprint will remain globally available free to read whether the journal accepts or rejects your manuscript.

For more information about posting to SSRN, please consult the SSRN Terms of Use and FAQs.

**Use of inclusive language**

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. When coding terminology is used, we recommend to avoid offensive or exclusionary terms such as "master", "slave", "blacklist" and "whitelist". We suggest using alternatives that are more appropriate and (self-) explanatory such as "primary", "secondary", "blocklist" and "allowlist". These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

**Reporting sex- and gender-based analyses**

**Reporting guidance**

For research involving or pertaining to humans, animals or eukaryotic cells, investigators should integrate sex and gender-based analyses (SGBA) into their research design according to funder/sponsor requirements and best practices within a field. Authors should address the sex and/or gender dimensions of their research in their article. In cases where they cannot, they should discuss this as a limitation to their research's generalizability. Importantly, authors should explicitly state what definitions of sex and/or gender they are applying to enhance the precision, rigor and reproducibility of their research and to avoid ambiguity or conflation of terms and the constructs to which they refer (see Definitions section below). Authors can refer to the Sex and Gender Equity in Research (SAGER) guidelines and the SAGER guidelines checklist. These offer systematic approaches to the use and editorial review of sex and gender information in study design, data analysis, outcome reporting and research interpretation - however, please note there is no single, universally agreed-upon set of guidelines for defining sex and gender.

**Definitions**

Sex generally refers to a set of biological attributes that are associated with physical and physiological features (e.g., chromosomal genotype, hormonal levels, internal and external anatomy). A binary sex categorization (male/female) is usually designated at birth ("sex assigned at birth"), most often based solely on the visible external anatomy of a newborn. Gender generally refers to socially constructed roles, behaviors, and identities of women, men and gender-diverse people that occur in a historical and cultural context and may vary across societies and over time. Gender influences how people view themselves and each other, how they behave and interact and how power is distributed in society. Sex and gender are often incorrectly portrayed as binary (female/male or woman/man) and unchanging whereas these constructs actually exist along a spectrum and include additional sex categorizations and gender identities such as people who are intersex/have differences of sex development (DSD) or identify as non-binary. Moreover, the terms "sex" and "gender" can be ambiguous—thus it is important
for authors to define the manner in which they are used. In addition to this definition guidance and the SAGER guidelines, the resources on this page offer further insight around sex and gender in research studies.

Please note that changes to the list of contributors are not permitted after the article has been accepted.

Authors' affiliations must be the institutions where the research presented in the article took place. Please note that changes to the author affiliations are not permitted once the corrected proof is published online.

Author contributions
For transparency, we require corresponding authors to provide co-author contributions to the manuscript using the relevant CRediT roles. The CRediT taxonomy includes 14 different roles describing each contributor's specific contribution to the scholarly output. The roles are: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; and Writing - review & editing. Note that not all roles may apply to every manuscript, and authors may have contributed through multiple roles. More details and an example.

Changes to authorship
Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed. Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

Article transfer service
This journal uses the Elsevier Article Transfer Service to find the best home for your manuscript. This means that if an editor feels your manuscript is more suitable for an alternative journal, you might be asked to consider transferring the manuscript to such a journal. The recommendation might be provided by a Journal Editor, a dedicated Scientific Managing Editor, a tool assisted recommendation, or a combination. If you agree, your manuscript will be transferred, though you will have the opportunity to make changes to the manuscript before the submission is complete. Please note that your manuscript will be independently reviewed by the new journal. More information.

Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.
Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement, it is recommended to state this.

Open access
Please visit our Open Access page for more information.

Elsevier Researcher Academy
Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the Language Editing service available from Elsevier's Language Services.

Submission
Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor’s decision and requests for revision, is sent by e-mail.

Additonal Information

PREPARATION

Queries
For questions about the editorial process (including the status of manuscripts under review) or for technical support on submissions, please visit our Support Center.

Peer review
This journal operates a single anonymized review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. Editors are not involved in decisions about papers which they have written themselves or have been written by family members or colleagues or which relate to products or services in which the editor has an interest. Any such submission is subject to all of the journal's usual procedures, with peer review handled independently of the relevant editor and their research groups. More information on types of peer review.

Use of word processing software
It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor’s options to justify text or to hyphenate words. However, do use bold face, italics, superscripts, subscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.
To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

**Article structure**

*Subdivision - numbered sections*

Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

**Introduction**

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

**Material and methods**

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

**Theory/calculation**

A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

**Results**

Results should be clear and concise.

**Discussion**

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

**Conclusions**

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

**Essential title page information**

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations.** Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, the e-mail address of each author.
- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that phone numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author.
- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

**Highlights**

Highlights are optional yet highly encouraged for this journal, as they increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).
**Abstract**
A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

**Keywords**
Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**
Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

**Acknowledgements**
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**Formatting of funding sources**
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, it is recommended to include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Math formulae**
Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

**Footnotes**
Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

**Artwork**

**Electronic artwork**

**General points**
- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
• Submit each illustration as a separate file.
• Ensure that color images are accessible to all, including those with impaired color vision.

A detailed guide on electronic artwork is available.

You are urged to visit this site; some excerpts from the detailed information are given here.

**Formats**

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

- EPS (or PDF): Vector drawings, embed all used fonts.
- TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
- TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
- TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

**Please do not:**

• Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
• Supply files that are too low in resolution;
• Submit graphics that are disproportionately large for the content.

**Color artwork**

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF) or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) in addition to color reproduction in print. Further information on the preparation of electronic artwork.

**Figure captions**

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

**Text graphics**

Text graphics may be embedded in the text at the appropriate position. If you are working with LaTeX and have such features embedded in the text, these can be left. See further under Electronic artwork.

**Tables**

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

**References**

**Citation in text**

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

**Web references**

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.
Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

Reference to software
We recommend that software (including computational code, scripts, models, notebooks and libraries) should be cited in the same way as other sources of information to support proper attribution and credit, reproducibility, collaboration and reuse, and encourage building on the work of others to further research. To facilitate this, useful information is provided in this article on the essentials of software citation by FORCE 11, of which Elsevier is a member. A reference to software should always include the following elements: creator(s) e.g. the authors or project that developed the software, software title, software repository, version (where available), year, and global persistent identifier.

Preprint references
Where a preprint has subsequently become available as a peer-reviewed publication, the formal publication should be used as the reference. If there are preprints that are central to your work or that cover crucial developments in the topic, but are not yet formally published, these may be referenced. Preprints should be clearly marked as such, for example by including the word preprint, or the name of the preprint server, as part of the reference. The preprint DOI should also be provided.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal’s style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

Reference style

List: references should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:
Reference to a journal publication:
Reference to a journal publication with an article number:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
Reference to a dataset:
Reference to a conference paper or poster presentation:

Reference to software:

Video
Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Data visualization
Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

Supplementary material
Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

Research data
This journal requires and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings, which may also include software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. When sharing data in one of these ways, you are expected to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.
**Data linking**

If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

**Research Elements**

This journal enables you to publish research objects related to your original research – such as data, methods, protocols, software and hardware – as an additional paper in a Research Elements journal.

Research Elements is a suite of peer-reviewed, open access journals which make your research objects findable, accessible and reusable. Articles place research objects into context by providing detailed descriptions of objects and their application, and linking to the associated original research articles. Research Elements articles can be prepared by you, or by one of your collaborators.

During submission, you will be alerted to the opportunity to prepare and submit a manuscript to one of the Research Elements journals.

More information can be found on the Research Elements page.

**Data statement**

To foster transparency, we require you to state the availability of your data in your submission if your data is unavailable to access or unsuitable to post. This may also be a requirement of your funding body or institution. You will have the opportunity to provide a data statement during the submission process. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

**AFTER ACCEPTANCE**

**Online proof correction**

To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

**Offprints**

The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is...
accepted for publication. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

**AUTHOR INQUIRIES**

Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch. You can also check the status of your submitted article or find out when your accepted article will be published.

© Copyright 2018 Elsevier | https://www.elsevier.com