



INFORMATION SCIENCES

Informatics and Computer Science Intelligent Systems Applications

AUTHOR INFORMATION PACK

TABLE OF CONTENTS

●	Description	p.1
●	Audience	p.2
●	Impact Factor	p.2
●	Abstracting and Indexing	p.2
●	Editorial Board	p.2
●	Guide for Authors	p.5



ISSN: 0020-0255

DESCRIPTION

Information Sciences will publish original, innovative and creative research results. A smaller number of timely tutorial and surveying contributions will be published from time to time.

The journal is designed to serve researchers, developers, managers, strategic planners, graduate students and others interested in state-of-the art research activities in **information, knowledge engineering** and **intelligent systems**. Readers are assumed to have a common interest in **information science**, but with diverse backgrounds in fields such as engineering, mathematics, statistics, physics, computer science, cell biology, molecular biology, management science, cognitive science, neurobiology, behavioural sciences and biochemistry.

The journal publishes high-quality, refereed articles. It emphasizes a balanced coverage of both theory and practice. It fully acknowledges and vividly promotes a breadth of the discipline of Informations Sciences.

Topics include:

Foundations of Information Science:

Information Theory, Mathematical Linguistics, Automata Theory, Cognitive Science, Theories of Qualitative Behaviour, Artificial Intelligence, Computational Intelligence, Soft Computing, Semiotics, Computational Biology and Bio-informatics.

Implementations and Information Technology:

Intelligent Systems, Genetic Algorithms and Modelling, Fuzzy Logic and Approximate Reasoning, Artificial Neural Networks, Expert and Decision Support Systems, Learning and Evolutionary Computing, Expert and Decision Support Systems, Learning and Evolutionary Computing, Biometrics, Moleculoid Nanocomputing, Self-adaptation and Self-organisational Systems, Data Engineering, Data Fusion, Information and Knowledge, Adaptive and Supervisory Control, Discrete Event Systems, Symbolic / Numeric and Statistical Techniques, Perceptions and Pattern Recognition, Design of Algorithms, Software Design, Computer Systems and Architecture Evaluations and Tools, Human-Computer Interface, Computer Communication Networks and Modelling and Computing with Words

Applications:

Manufacturing, Automation and Mobile Robots, Virtual Reality, Image Processing and Computer Vision Systems, Photonics Networks, Genomics and Bioinformatics, Brain Mapping, Language and Search

Engine Design, User-friendly Man Machine Interface, Data Compression and Text Abstraction and Summarization, Virtual Reality, Finance and Economics Modelling and Optimisation

Editor-in-Chief Witold Pedrycz can be reached at wpedrycz@ualberta.ca.

AUDIENCE

Workers pursuing basic investigations in the areas of information science focusing on informatics and computer science, intelligent systems, and applications.

IMPACT FACTOR

2016: 4.832 © Thomson Reuters Journal Citation Reports 2017

ABSTRACTING AND INDEXING

Current Contents
Energy Science and Technology
Engineering Village - GEOBASE
INSPEC
PASCAL/INIST-CNRS
SCISEARCH
Science Citation Index
Social Scisearch
UnCover
Zentralblatt MATH
Ei Compendex
Inside Conferences
Information Science & Technology Abstracts
Arts & Humanities Search
Scopus

EDITORIAL BOARD

Editor-in-Chief:

W. Pedrycz, Dept. of Electrical and Computer Engineering, University of Alberta, 9107 - 116 Street, Edmonton, T6G 2V4, Alberta, Canada

Special Issue Editor:

P.P. Wang, Dept. of Electrical Engin., Duke University, P.O. Box 90291, Durham, North Carolina, NC 27708-0291, USA

Associate Editors:

A. Adamatzky, University of the West of England, Bristol, UK
R. Aliev, Azerbaijan State Oil Academy, Baku, Azerbaijan
A. Bargiela, Nottingham, Nottingham, UK
A. Bretto, Université de Caen Basse Normandie, Caen Cedex, France
F. Buccafurri, Università Mediterranea di Reggio Calabria, Reggio Calabria, Italy
G. Castellano, Università degli Studi di Bari Aldo Moro, Bari, Italy
O. Castillo, Tijuana Institute of Technology, Tijuana, Mexico
P. Chan, South China University of Technology, China
S.M. Chen, National Taiwan University of Science and Technology, Taipei, Taiwan
Y.-P. Chen, National Chiao Tung University, Hsinchu City, Taiwan
F. Chiclana, De Montfort University, Leicester, England, UK
T.-M. Choi, The Hong Kong Polytechnic University, Hong Kong, China
D. Ciucci, Università degli Studi di Milano-Bicocca, Milano, Italy
A. Cuzzocrea, University of Trieste
S. Das, Indian Statistical Institute, Kolkata, India
W.-P. Ding, Nantong University, Nantong, China
M. Droste, Universität Leipzig, Leipzig, Germany

P. D'Urso, Università di Roma "La Sapienza", Rome, Italy
P. Ekel, Pontifícia Universidade Católica de Minas Gerais, Belo Horizonte, Brazil
S. Ferilli, Università degli Studi di Bari Aldo Moro, Bari, Italy
X. Gao, Aalto University, Helsinki, Finland
M.A. Gil, Universidad de Oviedo, Oviedo, Spain
G. Guo, Dalian Maritime University, Dalian, China
J.-M. Guo, National Taiwan University of Science and Technology, Taipei, Taiwan, ROC
P. Guo, Yokohama National University, Yokohama, Japan
P. Gupta, University of Delhi, Delhi, India
QL Han, Swinburne University of Technology, Melbourne, Victoria, Australia
W.-S. Han, POSTECH, Pohang, The Republic of Korea
L. Hernandez-Encinas, Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain
F. Herrera, Universidad de Granada, Granada, Spain
E. Herrera-Viedma, Universidad de Granada, Granada, Spain
W. Homenda, Warsaw University of Technology, Warsaw, Poland
R Hong, Hefei University of Technology
M. Jeon, Gwangju Institute of Science & Technology (GIST), Buk-gu Gwangju, The Republic of Korea
J. Kacprzyk, Polish Academy of Sciences, Warsaw, Poland
H.R. Karimi, Politecnico di Milano, Milan, Italy
S.-W. Kim, Hanyang University, Ansan, The Republic of Korea
R. Kruse, Otto-von-Guericke-Universität Magdeburg, Magdeburg, Germany
S. T.-W. Kwong, City University of Hong Kong, Kowloon, Hong Kong
D. Laurent, Université de Cergy-Pontoise, France
J. Li, Guangzhou University, Guangzhou, China
X. Li, Beijing University of Chemical Technology, Beijing, China
Z. Li, Xidian University, Xi'an, China
N. Liqiang, Shandong University, Jinan, China
F. Marcelloni, Università di Pisa, Pisa, Italy
U. Maulik, Jadavpur University, Parganas, India
J. Medina-Moreno, Universidad de Cádiz, Puerto Real, Spain
P. Melin, Tijuana Institute of Technology, Tijuana, Mexico
R. Mesiar, Slovak University of Technology, Bratislava, Czech Republic
S. Mitra, Indian Statistical Institute, Calcutta, India
Y. Mu, University of Wollongong, Wollongong, New South Wales, Australia
F. Neri, De Montfort University, Leicester, UK
F. Nie, University of Texas at Arlington, Arlington, Texas, USA
Y. Niu, East China University of Science and Technology, Shanghai, China
A. Nocera, Mediterranean University of Reggio Calabria, Reggio Calabria, Italy
S.-K. Oh, University of Suwon
R. Palm, Örebro University, Örebro, Sweden
F. Palmieri, Università degli Studi di Salerno, Fisciano, Italy
A. Petrosino, Università di Napoli "Parthenope", Napoli, Italy
S. Russel, George Washington University, Washington, District of Columbia, USA
M. Sato-Ilic, University of Tsukuba, Tsukuba, Japan
S. Senatore, Università degli Studi di Salerno, Fisciano (SA), Italy
L. Shao, University of Sheffield, Sheffield, UK
P. Shi, University of Adelaide, Adelaide, South Australia, Australia
P. Siarry, Université Val-de-Marne (Paris XII), Creteil, France
A. Skowron, Warsaw University, Warsaw, Poland
D. Slezak, Infobright Inc., Toronto, Ontario, Canada
M. Song, University of Washington, Seattle, Washington, USA
H. Stuckenschmidt, Universität Mannheim, Mannheim, Germany
X. Su, Chongqing University, Chongqing, China
P.N. Sugathan, Nanyang Technological University, Singapore, Singapore
P. Sussner, Universidade Estadual de Campinas (UNICAMP), Campinas, Brazil
R. Tadeusiewicz, AGH University of Science & Technology, Krakow, Poland
F. Tang, Shanghai Jiao Tong University, Shanghai, China
J. H. Tang, Nanjing University of Science and Technology, Nanjing, China
D. Tao, University of Technology Sydney, Sydney, New South Wales, Australia
Y. Tian, Queensland University of Technology, Brisbane, Queensland, Australia
M.K. Tiwari, IIT Kharagpur, Kharagpur, India
V. Torra, Consejo Superior de Investigaciones Científicas (CSIC), Bellaterra, Catalonia, Spain
D. Wang, Dalian University of Technology, Dalian, China
D.H. Wang, La Trobe University, Melbourne, Victoria, Australia
M. Wang, Hefei University of Technology, Hefei, China
X.-Z Wang, Hebei University, Baoding City, China
J. Watada, Waseda University, Fukuoka, Japan

Q. Wei, Chinese Academy of Sciences, Haidian District, Beijing, China
L. Wu, Harbin Institute of Technology, Harbin, China
N. Wu, Macau University of Science and Technology, Taipa, Macao
N Xiong, Colorado Technical University (CTU), Colorado Springs, Colorado, USA
X. Xu, National University of Defense Technology, Changsha, China
Z. Yan, Xidian University, Xi'an, China
L.T. Yang, St. Francis Xavier University, Antigonish, Nova Scotia, Canada
S. Yang, De Montfort University, Leicester, England, UK
Y.Y. Yao, University of Regina, Regina, Saskatchewan, Canada
I. You, Soonchunhyang University, Asan-si, The Republic of Korea
H. Yu, POSTECH, The Republic of Korea
J. Yu, Hangzhou Dianzi University, Hangzhou, China
J. Zhao, Dalian University of Technology, Dalian, China
S. Zhong, The State University of New York at Buffalo, Buffalo, New York, USA
Q. Zhu, University of Michigan at Dearborn, Dearborn, Michigan, USA

Editorial Board:

H. Adeli, The Ohio State University, Columbus, Ohio, USA
V. K. Bhargava, University of British Columbia, Vancouver, British Columbia, Canada
H.J. Caulfield, Alabama A & M University, Normal, USA
G. Chen, Tsinghua University, Beijing, China
H.D. Cheng, Utah State University, Logan, Utah, USA
F. Crestani, Università della Svizzera Italiana (USI), Lugano, Switzerland
D. Dubois, Université Paul Sabatier (Toulouse III), Toulouse, France
K. Elmagarmid, Purdue University, West Lafayette, Indiana, USA
T. Fukuda, Nagoya University, Nagoya, Japan
D.E. Goldberg, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA
S. Grossberg, Boston University, Boston, Massachusetts, USA
K. Hirota, Tokyo Institute of Technology, Yokohama, Japan
Y.C. Ho, Harvard University, Cambridge, Massachusetts, USA
N. Kasabov, Auckland University of Technology, Auckland, New Zealand
E.E. Kerre, Universiteit Gent, Gent, Belgium
B. Kosko, University of Southern California, Los Angeles, California, USA
X. Liu, Dalian University of Technology, Dalian, China
D. Manivannan, University of Kentucky, Lexington, Kentucky, USA
S.K. Pal, Indian Statistical Institute, Calcutta, India
H. Prade, Université Paul Sabatier (Toulouse III), Toulouse, France
M. Song, University of Washington, Seattle, Washington, USA
G. Succi, Libera Università di Bolzano, Bozen-Bolzano, Italy
A.V. Vasilakos, Luleå University of Technology, Luleå, Sweden
B. Wah, University of Illinois at Urbana-Champaign, Champaign, Illinois, USA
F.-Y. Wang, Chinese Academy of Sciences (CAS), Beijing, China
K. Weber, Robert BOSCH GmbH, Stuttgart, Germany
G. Weiss, Maastricht University, Maastricht, Netherlands
X. Yao, University of Birmingham, Edgbaston, Birmingham, UK
L.A. Zadeh†, University of California at Berkeley, Berkeley, California, USA
D. Zhang, Hong Kong University of Science and Technology, Kowloon, Hong Kong

GUIDE FOR AUTHORS

INTRODUCTION

Information Sciences will publish original, innovative and creative research results. A smaller number of timely tutorial and surveying contributions will be published from time to time.

The journal is designed to serve researchers, developers, managers, strategic planners, graduate students and others interested in state-of-the art research activities in information, knowledge engineering and intelligent systems. Readers are assumed to have a common interest in information science, but with diverse backgrounds in fields such as engineering, mathematics, statistics, physics, computer science, cell biology, molecular biology, management science, cognitive science, neurobiology, behavioural sciences and biochemistry.

The journal publishes high-quality, refereed articles. It emphasizes a balanced coverage of both theory and practice. It fully acknowledges and vividly promotes a breadth of the discipline of Informations Sciences.

Topics include:

Foundations of Information Science

Information Theory, Mathematical Linguistics, Automata Theory, Cognitive Science, Theories of Qualitative Behaviour, Artificial Intelligence, Computational Intelligence, Soft Computing, Semiotics, Computational Biology and Bio-informatics.

Implementations and Information Technology

Intelligent Systems, Genetic Algorithms and Modelling, Fuzzy Logic and Approximate Reasoning, Artificial Neural Networks, Expert and Decision Support Systems, Learning and Evolutionary Computing, Expert and Decision Support Systems, Biometrics, Moleculoid Nanocomputing, Self-adaptation and Self-organisational Systems, Data Engineering, Data Fusion, Information and Knowledge, Adaptive and Supervisory Control, Discrete Event Systems, Symbolic / Numeric and Statistical Techniques, Perceptions and Pattern Recognition, Design of Algorithms, Software Design, Computer Systems and Architecture Evaluations and Tools, Human-Computer Interface, Computer Communication Networks and Modelling and Computing with Words

Applications

Manufacturing, Automation and Mobile Robots, Virtual Reality, Image Processing and Computer Vision Systems, Photonics Networks, Genomics and Bioinformatics, Brain Mapping, Language and Search Engine Design, User-friendly Man Machine Interface, Data Compression and Text Abstraction and Summarization, Virtual Reality, Finance and Economics Modelling and Optimisation

Types of Paper

Original research work

As a guideline: experimental manuscripts should not be longer than 40 double-spaced typed pages and 8 figures + tables; for theoretical manuscripts a maximum of 45 pages and 10 figures + tables is suggested.

All manuscripts should be concisely written, stressing the motivation for, and the novel aspects of, the work. Contributions should contain an Abstract (of up to 200 words) and a Conclusions section, which particularly in the case of theoretical papers translates the results into terms readily accessible to most readers.

Contact details for submission

Manuscripts must be submitted online using the "Submit online to this journal" facility at the following website:

<http://ees.elsevier.com/ins>. Submission by other means, such as a postal submission, must receive prior approval from the Principal Editor. Authors should provide suggestions for 3 preferred referees (N.B., referee names should not be taken from the Editorial or Associate Editorial Board of the journal). However, we cannot guarantee that any referees suggested will be used.

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

For further information, visit our [Support Center](#).

BEFORE YOU BEGIN

Ethics in publishing

Please see our information pages on [Ethics in publishing](#) and [Ethical guidelines for journal publication](#).

Declaration of interest

All authors 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. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. [More information](#).

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 or as part of a published lecture or academic thesis or as an electronic preprint, see '[Multiple, redundant or concurrent publication](#)' section of our ethics policy 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 originality, your article may be checked by the originality detection service [CrossCheck](#).

Contributors

Each author is required to declare his or her individual contribution to the article: all authors must have materially participated in the research and/or article preparation, so roles for all authors should be described. The statement that all authors have approved the final article should be true and included in the disclosure.

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.

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.

For open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' ([more information](#)). Permitted third party reuse of open access articles is determined by the author's choice of [user license](#).

Author rights

As an author you (or your employer or institution) have certain rights to reuse your work. [More information](#).

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 then this should be stated.

Funding body agreements and policies

Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the Open Access Publication Fee. Details of [existing agreements](#) are available online.

Open access

This journal offers authors a choice in publishing their research:

Subscription

- Articles are made available to subscribers as well as developing countries and patient groups through our [universal access programs](#).
- No open access publication fee payable by authors.

Open access

- Articles are freely available to both subscribers and the wider public with permitted reuse.
- An open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For open access articles, permitted third party (re)use is defined by the following [Creative Commons user licenses](#):

Creative Commons Attribution (CC BY)

Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)

For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The open access publication fee for this journal is **USD 3300**, excluding taxes. Learn more about Elsevier's pricing policy: <https://www.elsevier.com/openaccesspricing>.

Green open access

Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our [green open access page](#) for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. [Find out more](#).

This journal has an embargo period of 24 months.

Elsevier Publishing Campus

The Elsevier Publishing Campus (www.publishingcampus.com) is an online platform offering free lectures, interactive training and professional advice to support you in publishing your research. The College of Skills training offers modules on how to prepare, write and structure your article and explains how editors will look at your paper when it is submitted for publication. Use these resources, and more, to ensure that your submission will be the best that you can make it.

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 [English Language Editing service](#) available from Elsevier's WebShop.

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.

Referees

Please submit the names and institutional e-mail addresses of several potential referees. For more details, visit our [Support site](#). Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

PREPARATION

Peer review

This journal operates a single blind 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. [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, subscripts, superscripts 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.

LaTeX

You are recommended to use the Elsevier article class [elsarticle.cls](#) to prepare your manuscript and [BibTeX](#) to generate your bibliography.

Our [LaTeX site](#) has detailed submission instructions, templates and other information.

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.

Vitae

Include in the manuscript a short (maximum 100 words) biography of each author, along with a passport-type photograph accompanying the other figures.

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.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. 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, if available, 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. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are 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.

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.

Highlights

Highlights are a short collection of bullet points that convey the core findings of the article. Highlights are optional and 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). You can view [example Highlights](#) on our information site.

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.

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, please 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.

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) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.** Please indicate your preference for color: in print or online only. [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.

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 and a copy of the title page of the relevant article must be submitted.

Reference links

Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is encouraged.

A DOI can be used to cite and link to electronic articles where an article is in-press and full citation details are not yet known, but the article is available online. A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. *Journal of Geophysical Research*, <https://doi.org/10.1029/2001JB000884>. Please note the format of such citations should be in the same style as all other references in the paper.

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. This identifier will not appear in your published article.

[dataset] [5] M. Oguro, S. Imahiro, S. Saito, T. Nakashizuka, Mortality data for Japanese oak wilt disease and surrounding forest compositions, Mendeley Data, v1, 2015. <http://dx.doi.org/10.17632/xwj98nb39r.1>.

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](#) and [Zotero](#), as well as [EndNote](#). Using the word processor 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.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:

<http://open.mendeley.com/use-citation-style/information-sciences>

When preparing your manuscript, you will then be able to select this style using the Mendeley plugins for Microsoft Word or LibreOffice.

Reference formatting

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct. If you do wish to format the references yourself they should be arranged according to the following examples:

Examples

"... and Chang and Weaver [1] show ...," etc.

The style of references:

(a) Journal papers: L.A. Zadeh, Toward a generalized theory of uncertainty (GTU)– an outline, *Information Sciences* 172 (2005) 1–40.

(b) Books: W. Pedrycz, F. Gomide, *Introduction to Fuzzy Sets*, MIT Press, Cambridge, MA, 1998.

(c) Conference proceedings: D. Poole, What the lottery paradox tells us about default reasoning, In: H.J. Levesque, R.J. Brachman, R. Reiter (Eds.), *Proc. 1st Int. Conf. Principles of Knowledge Representation and Reasoning, KR'89*, Morgan Kaufmann, San Mateo, CA, 1989, pp. 333–340.

Note: In the case of multiple authorship all authors should be listed in the references provided they number less than ten. Only in the case of more than 10 authors is "first author et al." acceptable.

Journal abbreviations source

Journal names should be abbreviated according to the [List of Title Word Abbreviations](#).

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 files in one of our recommended file formats with a preferred maximum size of 150 MB in total. Any single file should not exceed 50 MB. 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.

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.

Supplementary data

***NEW* INLINE SUPPLEMENTARY COMPUTER CODE**

Elsevier now offers you the possibility to place supplementary computer code, data snippets, algorithms and other machine readable structures at the right place in your online article in reusable .txt format. This will allow readers to easily view this material in the appropriate context, and to directly copy it to the clipboard or download the original source file for testing or re-use. If you would like to have reusable "computer code" inserted into the body of your online article please

indicate in your manuscript where they should be placed and number them in order of appearance, e.g. "Insert Inline Supplementary Computer Code 1 here". To support discoverability and reusability please submit these items in *.txt format and make sure to include a descriptive title and caption that references the characteristics and the appropriate environment of this material , e.g. 'An algorithm for filtering text files in R' . For more information please visit <http://www.elsevier.com/ism>

RESEARCH DATA

This journal encourages 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. To facilitate reproducibility and data reuse, this journal also encourages you to share your 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. If you are sharing data in one of these ways, you are encouraged 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).

Mendeley Data

This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. Before submitting your article, you can deposit the relevant datasets to *Mendeley Data*. Please include the DOI of the deposited dataset(s) in your main manuscript file. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the [Mendeley Data for journals page](#).

Data in Brief

You have the option of converting any or all parts of your supplementary or additional raw data into one or multiple data articles, a new kind of article that houses and describes your data. Data articles ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly available to all upon publication. You are encouraged to submit your article for *Data in Brief* as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to *Data in Brief* where it will be editorially reviewed and published in the open access data journal, *Data in Brief*. Please note an open access fee of 500 USD is payable for publication in *Data in Brief*. Full details can be found on the [Data in Brief website](#). Please use [this template](#) to write your Data in Brief.

MethodsX

You have the option of converting relevant protocols and methods into one or multiple MethodsX articles, a new kind of article that describes the details of customized research methods. Many researchers spend a significant amount of time on developing methods to fit their specific needs or setting, but often without getting credit for this part of their work. MethodsX, an open access journal, now publishes this information in order to make it searchable, peer reviewed, citable and reproducible.

Authors are encouraged to submit their MethodsX article as an additional item directly alongside the revised version of their manuscript. If your research article is accepted, your methods article will automatically be transferred over to MethodsX where it will be editorially reviewed. Please note an open access fee is payable for publication in MethodsX. Full details can be found on the MethodsX website. Please use [this template](#) to prepare your MethodsX article.

Data statement

To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the [Data Statement page](#).

AudioSlides

The journal encourages authors to create an AudioSlides presentation with their published article. AudioSlides are brief, webinar-style presentations that are shown next to the online article on ScienceDirect. This gives authors the opportunity to summarize their research in their own words and to help readers understand what the paper is about. [More information and examples are available](#). Authors of this journal will automatically receive an invitation e-mail to create an AudioSlides presentation after acceptance of their paper.

Interactive plots

This journal enables you to show an Interactive Plot with your article by simply submitting a data file. [Full instructions](#).

AFTER ACCEPTANCE

Online proof correction

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. Both corresponding and co-authors may order offprints at any time via Elsevier's [Webshop](#). Corresponding authors who have published their article 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 2014 Elsevier | <http://www.elsevier.com>