Description

This journal is ranked by: The Chartered Association of Business Schools' Academic Journal Guide, Australian Business Deans Council, Chinese Academy of Sciences (CAS), China Computer Federation (CCF), BFI (Denmark), Computing Research & Education (CORE) Journal Ranking, The Publication Forum (Finland), Science Citation Index Expanded, Social Sciences Citation Index, Scopus, and SCImago Journal Rank (SJR).

*Information Processing and Management* publishes cutting-edge original research at the intersection of computer and information science concerning theory, methods, or applications in a range of domains, including but not limited to business, marketing, advertising, social computing, and information technology.

The journal's aim is to serve the interests of researchers and practitioners in furthering knowledge at the intersection of computer and information science by providing an effective forum for the timely dissemination of advanced and topical issues. The journal is especially interested in original research articles, research survey articles, research method articles, and articles addressing critical applications of research.

Specifically, the journal is interested in three types of manuscripts, which are:
- Research manuscripts addressing topics at the intersection of computer and information science. Methods manuscripts focusing on the application of novel methods at the intersection of computer and information science.
- Review manuscripts assessing, in a critical and in-depth manner, a broad trend at the intersection of computer and information science, providing integration of the prior research, and recommendations for further work in the area.
- Critical application manuscripts concerning system design research at the intersection of computer and information science.

In 2002, Elsevier launched Library Connect, a new initiative bringing together many of Elsevier's library-focused efforts. For more information about this initiative and to read or subscribe to the complimentary Library Connect Newsletter, please visit [Library Connect](http://libraryconnect.elsevier.com).
AUDIENCE

For information scientists, computer scientists, librarians, cognitive scientists, and information systems and technology specialists interested in information retrieval (IR), organization of information, and management of information resources.

IMPACT FACTOR

2018: 3.892 © Clarivate Analytics Journal Citation Reports 2019

ABSTRACTING AND INDEXING

Research Alert
Current Contents
SSSA/CISA/ECA/ISMEC
Cambridge Scientific Abstracts
Chemical Abstracts
Current Contents
Current Contents - Engineering, Technology & Applied Sciences
Computer Contents
Current Technology Index
ERIC
Engineering Index
Ergonomics Abstracts
Information Science Abstracts
LISA (Library and Information Science Abstracts)
Leg Cont
Lib Sci Abstr
Library Literature
Management Contents
Pascal Francis
PIRA
BIOSIS Citation Index
Current Contents - Social & Behavioral Sciences
CompuMath Citation Index
CompuScience
Zentralblatt MATH
PsycINFO
Scopus
INSPEC
Social Sciences Citation Index
CMCI
Science Citation Index Expanded

EDITORIAL BOARD

Editor in Chief
Jim Jansen, Hamad Bin Khalifa University, Tornado Tower, 13th floor, Doha, Qatar

Associate Editors
Yuelin Li, Nankai University Department of Information Resources Management, 300071, Tianjin, China
Paolo Rosso, Polytechnic University of Valencia Department of Computing and Systems, Camí de Vera s/n., 46022, Valencia, Spain
Ian Ruthven, University of Strathclyde Department of Computer and Information Sciences, Livingstone Tower 26 Richmond Street, G1 1XH, Glasgow, United Kingdom
Xiuzhen (Jenny) Zhang, RMIT University College of Science Engineering and Health, PO Box 71, Melbourne, 3083, Australia
Emeritus Editors

Fabio Crestani, USI Faculty of Informatics, Via Giuseppe Buffi 13, CH-6904, Lugano, Switzerland
Tefko Saracevic, Rutgers The State University of New Jersey, New Brunswick, New Jersey, NJ 08854, United States

Editorial Board

Mahmoud Al-Ayyoub, Jordan University of Science and Technology Faculty of Computer and Information Technology, Irbid, Jordan
Omar Alonso, Microsoft Corp, Seattle, Washington, United States
Alexandra Baiahu, European Commission Joint Research Centre Ispra Sector, Ispra, Italy
Alejandro Bellogin, Autonomous University of Madrid Higher Polytechnical School, Madrid, Spain
Imene Bensalem, University of Constantine 1, Constantine, Algeria
Rafael Berlanga, Universitat Jaume I, Departamento de Lenguajes y Sistemas Informáticos, Castellón de la Plana, Spain
Dania Bilal, The University of Tennessee Knoxville School of Information Sciences, Knoxville, Tennessee, United States
Ludovico Boratto, The Data Science & Big Data Analytics Department, Eurecat, Barcelona, Spain
Pia Borlund, University of Copenhagen Department of Communication, København S, Denmark
Christina Bosco, University of Turin Department of Computer Science, Torino, Italy
Marc Bron, Schibsted Media Group, Oslo, Norway
George Buchanan, City University of London Centre for Human Computer Interaction Design, London, United Kingdom
Leticia Cagnina, National University of San Luis Laboratory for Research and Development in Computational Intelligence, San Luis, Argentina
Fei Cai, National University of Defense Technology, Changsha, China
Nadia Caidi, University of Toronto Faculty of Information, Toronto, Ontario, Canada
Berkan Cantazoglu, NTENT-Hispania SL, Barcelona, Spain
Erik Cambria, Nanyang Technological University School of Computer Engineering, Singapore, Singapore
Ricardo Campos, Polytechnic Institute of Tomar, Tomar, Portugal
Lynn Connaway, OCLC Online Computer Library Center Inc, Dublin, Ohio, United States
Fabio Crestani, USI Faculty of Informatics, Lugano, Switzerland
Livio Cricelli, University of Cassino and Southern Lazio Department of Civil and Mechanic Engineering, Cassino, Italy
Brian Detlor, McMaster University DeGroote School of Business, Hamilton, Ontario, Canada
Ying Ding, University of Texas at Austin School of Information, Austin, Texas, United States
Jia Tina Du, University of South Australia, School of Information Technology and Mathematical Sciences, Adelaide, South Australia, Australia
Tamer Elsayed, Qatar University College of Engineering, Doha, Qatar
Andrea Esuli, Alessandro Faedo Institute of Science and Technology National Research Council, Pisa, Italy
Yixiang Fang, University of New South Wales School of Computer Science and Engineering, Kensington, New South Wales, Australia
Jesualdo Tomas Fernandez Breis, University of Murcia, Murcia, Spain
Elisabetta Fersini, University of Milano Bicocca Department of Informatics Systems and Communication, Milano, Italy
Flavius Frasincar, Erasmus University Rotterdam Department of Econometrics, Rotterdam, Netherlands
Anastasia Giachanou, University of Italian Switzerland, Lugano, Switzerland
Michele Grimaldi, Università degli Studi di Cassino e del Lazio Meridionale, Department of Civil and Mechanical Engineering, Cassino, Italy
Quanquan Gu, University of Virginia, Charlottesville, Virginia, United States
Allan Hanbury, TU Wien University, Wien, Austria
Ben He, University of the Chinese Academy of Sciences School of Computer Science and Technology, Beijing, China
Daliang He, University of Pittsburgh School of Information Sciences, Pittsburgh, Pennsylvania, United States
Sandy Hirsh, San Jose State University, San Jose, California, United States
Orland Hoebre, University of Regina Department of Computer Science, Regina, Saskatchewan, Canada
Frank Hopfgartner, University of Glasgow, Glasgow, Scotland, United Kingdom
Kai Hui, Amazon Alexa, Berlin, Germany
Yaser Jararweh, Jordan University of Science and Technology, Irbid, Jordan
Adam Jetowt, Kyotou University, Kyoto, Japan
Jing Jiang, Singapore Management University School of Information Systems, Singapore, Singapore
Tingting Jiang, Wuhan University School of Information Management, Wuhan, China
Hideo Joho, University of Tsukuba, Tsukuba, Japan
Hanmin Jung, Korea Institute of Science and Technology, Seongbuk-gu, Korea, Republic of
Jason Jung, Chung-Ang University, Seoul, Korea, Republic of
Jaap Kamps, University of Amsterdam, Amsterdam, Netherlands
Paul Kantor, Rutgers University School of Communication and Information, New Brunswick, New Jersey, United States
Jaana Kekalainen, University of Tampere Department of Information Studies and Interactive Media, TAMPERE, Finland
Diane Kelly, The University of Tennessee Knoxville School of Information Sciences, Knoxville, Tennessee, United States
Tom Kenter, University of Amsterdam, Amsterdam, Netherlands
Jang-Hyun Kim, Sungkyunkwan University Department of Interaction Science, Jongno-gu, Korea, Republic of
Yunhyong Kim, University of Glasgow Humanities Advanced Technology and Information Institute, Glasgow, United Kingdom
Alberto Laender, Federal University of Minas Gerais, Belo Horizonte, Brazil
Chenliang Li, Wuhan University, School of Cyber Science and Engineering, Wuhan, China
Cong Li, University of Miami School of Communication, Coral Gables, Florida, United States
Shangsong Liang, University College London Division of Psychiatry, London, United Kingdom
Chang Liu, Peking University Department of Information Management, Beijing, China
Jingjing Liu, University of South Carolina School of Library and Information Science, Columbia, South Carolina, United States
Rey-Long Liu, Tzu Chi University Department of Medical Informatics, Hualien, Taiwan
Wenbin Liu, Kent Business School, Canterbury, United Kingdom
Ying-Hsang Liu, Australian National University School of Computer Science, Canberra, Australia
Robert Luk, The Hong Kong Polytechnic University Faculty of Engineering Department of Computing, Kowloon, Hong Kong
Ana Meštrović, University of Rijeka Department of Informatics, Rijeka, Croatia
Prasenjit Mitra, Pennsylvania State University, University Park, Pennsylvania, United States
Murad Moqbel, University of Oklahoma, Norman, Oklahoma, United States
Javed Mostafa, University of North Carolina at Chapel Hill Biomedical Research Imaging Center, Chapel Hill, North Carolina, United States
Xiangming (Simon) Mu, University of Wisconsin Milwaukee School of Information Studies, Milwaukee, Wisconsin, United States
Kjetil Nørvåg, Norwegian University of Science and Technology Department of Computer Science, Trondheim, Norway
Javier Parapar, University of A Coruna, A Coruna, Spain
Michal Ptasznyski, Kitami Institute of Technology, Department of Computer Science, Kitami, Japan
Hemant Purohit, George Mason University Volgenau School of Information Technology and Engineering, FAIRFAX, Virginia, United States
Mingjie Qian, Yahoo! Inc, Sunnyvale, California, United States
Francisco Rangel, Autoritas Consulting SA, Valencia, Spain
Edie M. Rasmussen, The University of British Columbia Irving K Barber Learning Centre, Vancouver, British Columbia, Canada
Madhu Reddy, Northwestern University School of Communication, Evanston, Illinois, United States
Zhaochun Ren, Shandong University, Jinan, China
Francisco Romero, University of Castilla-La Mancha, Ciudad Real, Spain
Mohammad Salehan, California State Polytechnic University Pomona College of Business Administration, Pomona, California, United States
Eric SanJuan, Avignon University, Avignon, France
Giovanni Da San Martino, Hamad Bin Khalifa University, Qatar Computing Research Institute, Doha, Qatar
Tefko Saracevic, Rutgers The State University of New Jersey, New Brunswick, New Jersey, United States
Chirag Shah, University of Washington Information School, Seattle, Washington, United States
Jialie Shen, Queen's University Belfast, Belfast, United Kingdom
Yue Shi, Yahoo! Inc, Sunnyvale, California, United States
Dong-hee Shin, Chung-Ang University School of Media and Communication, Dongjak-gu, Korea, Republic of
Gianmaria Silvello, University of Padua Department of Information Engineering, Padova, Italy
Catherine Smith, Kent State University College of Communication and Information, Kent, Ohio, United States
Xuemeng Song, Shandong University School of Computer Science and Technology, Qingdao, China
Damiano Spina, RMIT University College of Science Engineering and Health, Melbourne, Australia
Efstathios Stamatakos, University of the Aegean Department of Information and Communication Systems Engineering, Samos, Greece
Luca Toldo, SAP SE, Walldorf, Germany
Elaine Toms, The University of Sheffield Information School, Sheffield, United Kingdom
Andrew Trotman, University of Otago Department of Computer Science, Dunedin, New Zealand
Pertti Vakkari, University of Tampere School of Information Sciences, Tampere, Finland
Liwen Vaughan, Western University Faculty of Information and Media Studies, London, Ontario, Canada
Dan Wu, Wuhan University School of Information Management, Wuhan, China
Shengli Wu, Jiangsu Normal University, Xuzhou, China
Yanwu Yang, Huazhong University of Science and Technology, Wuhan, China
Yin David Yang, Hamad Bin Khalifa University, Doha, Qatar
Andrew Yates, Max Planck Institute for Computer Science, Saarbrücken, Germany
Jin Zhang, University of Wisconsin Milwaukee School of Information Studies, Milwaukee, Wisconsin, United States
Pengyi Zhang, Peking University Department of Information Management, Beijing, China
Yuxiang (Chris) Zhao, Nanjing University of Science and Technology, Nanjing, China
Jianghua Zhou, Beijing Normal University Business School, Beijing, China
Arkaitz Zubiaga, Queen Mary University of London School of Electronic Engineering and Computer Science, London, United Kingdom
GUIDE FOR AUTHORS

Your Paper Your Way
We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.

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 competing interests 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, 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 originality, your article may be checked by the originality detection service Crossref
Similarity Check.

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).

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences,
and promotes equal opportunities. Articles should make no assumptions about the beliefs or
commitments of any reader, should contain nothing which might imply that one individual is superior
to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive
language throughout. Authors should ensure that writing is free from bias, for instance by using 'he
or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping
(e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

Author contributions
For transparency, we encourage authors to submit an author statement file outlining their individual
contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation;
Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources;
Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review &
editing. Authorship statements should be formatted with the names of authors first and CRediT role(s)
following. 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 is part of our Article Transfer Service. This means that if the Editor feels your article is
more suitable in one of our other participating journals, then you may be asked to consider transferring
the article to one of those. If you agree, your article will be transferred automatically on your behalf
with no need to reformat. Please note that your article will be reviewed again 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
excerpt 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 gold 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 gold 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.

**Open access**
Please visit our Open Access page from the Journal Homepage 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 English Language Editing service available from Elsevier's Author 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.

Submit your article
Please submit your article via https://www.evise.com/profile/#/IPM/login.

**PREPARATION**

NEW SUBMISSIONS
Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process. As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

If you wish, IP&M has example templates in both Word and LaTeX formats, to aid with submissions. The templates can be found at the following link (https://drive.google.com/drive/folders/0B00-HSF1FnbLTINCV1FrR0RITIE?usp=sharing), and any questions should be directed to the Editor-in-Chief.
References
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 article number or 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.

Formatting requirements
There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions.
If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.
Divide the article into clearly defined sections.

Figures and tables embedded in text
Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

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.

REVISED SUBMISSIONS
Use of word processing software
Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). 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.

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
A short Conclusions section is to be presented and should be divided into specific points.

Appendices
If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

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 lowercase 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.

**Highlights**

Highlights are mandatory for this journal as they help 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 examples here: 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.

**Graphical abstract**

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site.

Authors can make use of Elsevier's Illustration Services to ensure the best presentation of their images and in accordance with all technical requirements.

**Keywords**

Immediately after the maximum of 6 keywords, 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. The keywords should be in the style of one of the major thesauruses. Since the abstract and keywords will be used in automatic indexing, the terminology selected should be suitable for computer analysis.

**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.

Footnotes
Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article.

Artwork
Electronic artwork
General points
• Make sure you use uniform lettering and sizing of your original artwork.
• Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
• Number the illustrations according to their sequence in the text.
• Use a logical naming convention for your artwork files.
• Indicate per figure if it is a single, 1.5 or 2-column fitting image.
• For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
• Please note that individual figure files larger than 10 MB must be provided in separate source files.

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
Regardless of the application used, 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 the font or save the text as 'graphics'.
TIFF (or JPG): Color or grayscale photographs (halftones): always use a minimum of 300 dpi.
TIFF (or JPG): Bitmapped line drawings: use a minimum of 1000 dpi.
TIFF (or JPG): Combinations bitmapped line/half-tone (color or grayscale): a minimum of 500 dpi is required.
Please do not:
• Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
• 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. 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.

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 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.

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-processing-and-management

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins 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 article number or 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:

Reference style
Text: Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5, copies of which may be ordered online or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK.
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:

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 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. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to *Mendeley Data*. 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](https://www.mendeley.com/).

**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 600 USD is payable for publication in *Data in Brief*. Full details can be found on the [Data in Brief website](https://www.datainbrief.com/). Please use this [template](https://www.datainbrief.com/authors/tutorials) to write your Data in Brief.

**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](https://www.sciencedirect.com/journal/author-services/data-statement).

### 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](https://www.sciencedirect.com/blog/how-to-get-offprints-for-free) 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 [Author Services](https://www.sciencedirect.com/article/author-services). 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](https://www.sciencedirect.com/shop/author-support) 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