TABLE OF CONTENTS

- Description p.1
- Impact Factor p.2
- Abstracting and Indexing p.2
- Editorial Board p.2
- Guide for Authors p.7

DESCRIPTION

Neurocomputing publishes articles describing recent fundamental contributions in the field of neurocomputing. Neurocomputing theory, practice and applications are the essential topics being covered.

NEW! Neurocomputing's Software Track allows you to expose your complete Software work to the community through a novel Publication format: the Original Software Publication

Overview:

Neurocomputing welcomes theoretical contributions aimed at winning further understanding of neural networks and learning systems, including, but not restricted to, architectures, learning methods, analysis of network dynamics, theories of learning, self-organization, biological neural network modelling, sensorimotor transformations and interdisciplinary topics with artificial intelligence, artificial life, cognitive science, computational learning theory, fuzzy logic, genetic algorithms, information theory, machine learning, neurobiology and pattern recognition.

Neurocomputing covers practical aspects with contributions on advances in hardware and software development environments for neurocomputing, including, but not restricted to, simulation software environments, emulation hardware architectures, models of concurrent computation, neurocomputers, and neurochips (digital, analog, optical, and biodevices).

Neurocomputing reports on applications in different fields, including, but not restricted to, signal processing, speech processing, image processing, computer vision, control, robotics, optimization, scheduling, resource allocation and financial forecasting.

Types of publications:

Neurocomputing publishes reviews of literature about neurocomputing and affine fields.

Neurocomputing reports on meetings, including, but not restricted to, conferences, workshops and seminars.

Neurocomputing Letters allow for the rapid publication of special short communications.

NEW! The Neurocomputing Software Track
Neurocomputing Software Track publishes a new format, the Original Software Publication (OSP) to disseminate exiting and useful software in the areas of neural networks and learning systems, including, but not restricted to, architectures, learning methods, analysis of network dynamics, theories of learning, self-organization, biological neural network modelling, sensorimotor transformations and interdisciplinary topics with artificial intelligence, artificial life, cognitive science, computational learning theory, fuzzy logic, genetic algorithms, information theory, machine learning, neurobiology and pattern recognition. We encourage high-quality original software submissions which contain non-trivial contributions in the above areas related to the implementations of algorithms, toolboxes, and real systems. The software must adhere to a recognized legal license, such as OSI approved licenses.

Importantly, the software will be a full peer reviewed publication that is able to capture your software updates once they are released. To fully acknowledge the author's/developers work your software will be fully citable as an Original Software Publication, archived and indexed and available as a complete online "body of work" for other researchers and practitioners to discover.

See the detailed Submission instructions, and more information about the process for academically publishing your Software: here

**IMPACT FACTOR**

2018: 4.072 © Clarivate Analytics Journal Citation Reports 2019

**ABSTRACTING AND INDEXING**

Abstracts in Human-Computer Interaction
AI Robotics Abstracts
Computer Abstracts
Embase
Engineering Index
Mathematical Reviews
INSPEC
CompuScience
Current Contents - Engineering, Technology & Applied Sciences
Cambridge Scientific Abstracts
Current Contents
Neuroscience Citation Index
Research Alert
Web of Science
Zentralblatt MATH
Scopus
Computer Literature Index
PsycINFO

**EDITORIAL BOARD**

*Editors-in-Chief*

Zidong Wang, Brunel University Department of Computer Science, Kingston Lane, UB8 3PH, Uxbridge, Middlesex, United Kingdom, Fax: +44/1895 251686

Steven Hoi, Singapore Management University School of Information Systems, 80 Stamford Road, 178902, Singapore, Singapore, Fax: +65 6828 0919

*Editorial Board (Software Section)*

Qi He, LinkedIn Corp, Mountain View, California, 94043-4655, United States

Bin Li, Wuhan University Department of Finance, Wuhan, China

Wei Liu, Tencent AI Lab Beijing, Beijing, China
David Lo, Singapore Management University School of Information Systems, 80 Stamford Road, 178902, Singapore, Singapore
Jia Wu, Macquarie University Department of Computing, Building E6A, Sydney, 2109, Australia
Lei Zhang, Microsoft Corp Seattle, Washington, United States
Jianke Zhu, Zhejiang University College of Computer Science and Technology, No. 38, Zheda Road, 310027, Hangzhou, China

Editorial Board (Regular Section)
Choon Ki Ahn, Korea University School of Electrical Engineering, Seongbuk-gu, Korea, Republic of
Hamid Alinejad-Rokn, Harry Perkins Institute of Medical Research, Perth, Australia
Javier Andreu-Perez, University of Essex, Colchester, United Kingdom
Sabri Arik, Istanbul University-Cerrahpasa Department of Computer Engineering, Istanbul, Turkey
Xiang Bai, Huazhong University of Science and Technology, Wuhan, China
Javier Bajo, Technical University of Madrid Department of Artificial Intelligence, Madrid, Spain
Yukun Bao, Huazhong University of Science and Technology, Wuhan, China
Ammar Belatreche, Ulster University School of Computing Engineering and Intelligent Systems, Londonderry, United Kingdom
Monica Bianchini, University of Siena, Siena, Italy
Jiajun Bu, Zhejiang University, Hangzhou, China
Francis M Bui, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
Deng Cai, Zhejiang University, Hangzhou, China
Erik Cambria, Nanyang Technological University School of Computer Engineering, Singapore, Singapore
Xianbin Cao, Beihang University, Beijing, China
Rodrigo Capobianco Guido, Sao Paulo State University Julio de Mesquita Filho - Sao Jose do Rio Preto Campus, Sao Jose do Rio Preto, Sao Paulo, Brazil
Yi Chang, Yahoo! Inc, Sunnyvale, California, United States
Chen Chen, University of North Carolina at Charlotte, Charlotte, North Carolina, United States
Mou Chen, Nanjing University of Aeronautics and Astronautics, Nanjing, China
Jun Cheng, Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences, Shenzhen, China
Long Cheng, Chinese Academy of Sciences, Beijing, China
Yuhua Cheng, University of Electronic Science and Technology of China, Chengdu, China
Yiu-ming Cheung, Hong Kong Baptist University Department of Computer Science, Hong Kong, Hong Kong
Domenico Ciouonzo, Network Measurement and Monitoring, Naples, Italy
Mario Collotta, Kore University of Enna, Enna, Italy
Vincenzo Conti, Kore University of Enna, Enna, Italy
Marco Cristiani, University of Verona Department of Computer Science, Verona, Italy
Swagatami Das, Indian Statistical Institute Computer and Communication Sciences Division, Kolkata, India
Cheng Deng, Xidian University, Xian, China
Zhaohong Deng, Jiangnan University, Wuxi, Jiangsu, China
Derui Ding, Swinburne University of Technology School of Software and Electrical Engineering, Melbourne, Victoria, Australia
Hongli Dong, Northeast Petroleum University, Daqing, China
Yongsheng Dong, Henan University of Technology, School of Information Engineering, Luoyang, China
Bo Du, Wuhan University School of Computer Science, Wuhan, China
Lixin Duan, University of Electronic Science and Technology of China, Chengdu, China
Shukai Duan, Southwest University, Chongqing, China
Witold Dunin-Barkowski, Russian Academy of Sciences, Moskva, Russian Federation
Bin Fan, Chinese Academy of Sciences, Beijing, China
Jianping Fan, University of North Carolina at Charlotte, Charlotte, North Carolina, United States
Leyuan Fang, Hunan University, Changsha, China
Wei Feng, Tianjin University, Tianjin, China
Giuseppe Fenza, University of Salerno, Fisciano, Italy
Wojciech Frölich, University of Silesia Institute of Computer Science, Sosnowiec, Poland
Shenghua Gao, ShanghaiTech University, Shanghai, China
Weinan Gao, Harbin Institute of Technology, Harbin, China
Ziyu Guan, Nanjing University of Technology School of Computer Engineering, Singapore, Singapore
Ziyu Guan, Nanjing University of Technology School of Computer Engineering, Singapore, Singapore
Daqing Han, Northumbria University, Newcastle Upon Tyne, United Kingdom
Junwei Han, Northwestern Polytechnical University, Xian, China
Bin He, Tongji University Department of Control Science and Engineering, Shanghai, China
Ran He, Chinese Academy of Sciences, Beijing, China
Wei He, University of Science and Technology Beijing, Beijing, China  
Romain Herault, Normandie Univ, UnivRouen, UnivHavre, INSA Rouen, LITIS, Saint-Étienne-du-Rouvray, France  
Wei-Chiang Hong, Jiangsu Normal University School of Computer Science and Technology, Xuzhou, China  
Xia Hong, University of Reading, Reading, United Kingdom  
Chenping Hou, National University of Defense Technology, Changsha, China  
Bingliang Hu, Chinese Academy of Sciences, Beijing, China  
Jun Hu, Harbin University of Science and Technology, Harbin, China  
Guang Bin Huang, Nanyang Technological University, Singapore, Singapore  
He Huang, Soochow University, Suzhou, China  
Kaishu Huang, Xi'an Jiaotong-Liverpool University, Department of Electrical and Electronic Engineering, Suzhou, China  
Yufei Huang, University of Texas at San Antonio Department of Electrical and Computer Engineering, San Antonio, Texas, United States  
Alexandros Iosifidis, Aarhus University, Aarhus, Denmark  
Bin Jiang, Nanjing University of Aeronautics and Astronautics College of Automation Engineering, Nanjing, China  
Haijun Jiang, Xinjiang University College of Mathematics and System Sciences, Urumqi, China  
Jing Jiang, Singapore Management University School of Information Systems, Singapore, Singapore  
Yu-Gang Jiang, Fudan University, Shanghai, China  
Firat Kacar, Istanbul University-Cerrahpasa Faculty of Engineering, Istanbul, Turkey  
Hamid Reza Karimi, Polytechnic of Milan Department of Mechanical Engineering, Milan, Italy  
Farrukh Aslam Khan, King Saud University, Riyadh, Saudi Arabia  
Kee-Eung Kim, Korea Advanced Institute of Science and Technology, Daejeon, Korea, Republic of  
Amit Konar, Jadavpur University, Kolkata, India  
Robert Kozuma, University of Memphis, Memphis, Tennessee, United States  
Lukasz Kurgan, University of Alberta, Edmonton, Alberta, Canada  
James Kwok, Hong Kong University of Science and Technology Department of Electronic and Computer Engineering, Kowloon, Hong Kong  
Hak-Keung Lam, King's College London, London, United Kingdom  
Jianjun Lei, Tianjin University, Tianjin, China  
Zhem Lei, Chinese Academy of Sciences, Beijing, China  
Amaury Lendasse, University of Houston, Houston, Texas, United States  
Bing Li, Chinese Academy of Sciences, Beijing, China  
Fuxin Li, Oregon State University, Corvallis, Oregon, United States  
Kang Li, Queen's University Belfast, Belfast, United Kingdom  
Sheng Li, Adobe Research, San Jose, California, United States  
Yongmin Li, Brunel University London, Uxbridge, United Kingdom  
Zecao Li, Nanjing University of Science and Technology, Nanjing, China  
Zhifeng Li, Tencent AI Lab Beijing, Beijing, China  
Jinling Liang, Southeast University Department of Mathematics, Nanjing, China  
Ronghua Liang, Zhejiang University of Technology, Hangzhou, China  
Chencheng Liu, Clarkson University, Potsdam, New York, United States  
Guangcan Liu, Nanjing University of Science and Technology, Nanjing, China  
Hantao Liu, Cardiff University, Cardiff, United Kingdom  
Jianxiong Liu, Harbin Institute of Technology School of Astronautics, Department of Control Science and Engineering, Harbin, China  
Qingshan Liu, Chinese Academy of Sciences, Beijing, China  
Shenglan Liu, Dalian University of Technology, Dalian, China  
Tie-Yan Liu, Microsoft Research Asia, Beijing, China  
Wei Liu, Tencent AI Lab Beijing, Beijing, China  
Xiaoming Liu, Michigan State University, East Lansing, Michigan, United States  
Xiwei Liu, Tongji University, Shanghai, China  
Yonghual Liu, Edge Hill University Department of Computing, Ormskirk, United Kingdom  
Yurong Liu, Yangzhou University, Yangzhou, China  
Zhi-Yong Liu, Chinese Academy of Sciences, Beijing, China  
Xiaoxiang Lu, Xi'an Institute of Optics and Precision Mechanics, Xi'an, China  
Biao Luo, Central South University School of Information Science and Engineering, Changsha, China  
Xin Luo, Chongqing Institute of Green and Intelligent Technology, Chongqing, China  
Jiayi Ma, Wuhan University, Wuhan, China  
Lifeng Ma, Nanjing University of Science and Technology, Nanjing, China  
Zhanyu Ma, Beijing University of Posts and Telecommunications, Beijing, China  
Gaofeng Meng, Chinese Academy of Sciences, Beijing, China  
Yoan Miche, Nokia Bell Labs Espoo, Espoo, Finland  
Leandro L. Minku, University of Birmingham School of Computer Science, Birmingham, United Kingdom  
Sushmita Mitra, Indian Statistical Institute, Kolkata, India  
Tingting Mu, University of Liverpool, Liverpool, United Kingdom  
Jing Na, Kunming University of Science and Technology - Lianhua Campus, Kunming, China  
Robert Newcomb, University of Maryland at College Park, College Park, Maryland, United States
Zenglin Xu, University of Electronics Science and Technology of China School of Computer Science and Engineering, Chengdu, Sichuan, China
Makoto Yamada, Kyoto University, Kyoto, Japan
Bo Yan, Fudan University, Shanghai, China
Pingkun Yan, Center for OPTical IMagery Analysis and Learning, Xián, Shaanxi, China
Chenguang Yang, Swansea University, Swansea, United Kingdom
Haiqin Yang, Chinese University of Hong Kong Department of Computer Science and Engineering, New Territories, Hong Kong
Rongni Yang, Shandong University, Jinan, China
Tianbao Yang, University of Iowa, Iowa City, Iowa, United States
Shen Yin, Harbin Institute of Technology, Harbin, China
Yiming Ying, University at Albany State University of New York, Albany, New York, United States
Hui Yu, University of Portsmouth, Portsmouth, United Kingdom
Jun Yu, Xiamen University, Xiamen, China
Wen Yu, Center for Research and Advanced Studies of the National Polytechnic Institute, Ciudad de Mexico, Mexico
Zhu Liang Yu, South China University of Technology School of Automation Science and Engineering, Guangzhou, China
Yuan Yuan, Northwestern Polytechnical University, Xian, China
Nianyin Zeng, Fuzhou University, Fuzhou, China
Zhi-Hui Zhan, South China University of Technology, Guangzhou, China
Guoqiang (Peter) Zhang, Georgia State University, Atlanta, Georgia, United States
Haijun Zhang, Harbin Institute of Technology Shenzhen School of Computer Science and Technology, Shenzhen, China
Huaguang Zhang, Northeastern University, Shenyang, China
Jie Zhang, Newcastle University, Newcastle Upon Tyne, United Kingdom
Shaoting Zhang, University of North Carolina at Charlotte, Charlotte, North Carolina, United States
Tianzhu Zhang, Chinese Academy of Sciences, Beijing, China
Xianming Zhang, Swinburne University of Technology School of Software and Electrical Engineering, Melbourne, Victoria, Australia
Yongdong Zhang, Chinese Academy of Sciences, Beijing, China
Zhao Zhang, Soochow University, Suzhou, China
Zhaoxiang Zhang, Chinese Academy of Sciences, Beijing, China
Chunhui Zhao, Zhejiang University Department of Control Science and Engineering, Hangzhou, China
Peilin Zhao, Tencent AI Lab, Shenzhen, China
Xudong Zhao, University of Hong Kong, Pokfulam, Hong Kong
Jiayu Zhou, Samsung Research America, Mountain View, California, United States
Xiuzhuang Zhou, Beijing University of Posts and Telecommunications, Beijing, China
Yicong Zhou, University of Macau, Taipa, Macao
Xiaofeng Zhu, Guangxi Normal University, Guilin, China
Lei Zou, Shandong University School of Science and Technology, Qingdao, China
GUIDE FOR AUTHORS

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 should complete the declaration of interest statement using this template and upload to the submission system at the Attach/Upload Files step. If there are no interests to declare, please choose: 'Declarations of interest: none' in the template. This statement will be published within the article if accepted. 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.

**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 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.

Original Software Publications
The Software Track of Neurocomputing publishes Original Software Publications (OSP) to disseminate exiting and useful software in the areas of neural networks and learning systems, including, but not restricted to, architectures, learning methods, analysis of network dynamics, theories of learning, self-organization, biological neural network modelling, sensorimotor transformations and interdisciplinary topics with artificial intelligence, artificial life, cognitive science, computational learning theory, fuzzy logic, genetic algorithms, information theory, machine learning, neurobiology and pattern recognition. We encourage high-quality original software submissions which contain non-trivial contributions in the above areas related to the implementations of algorithms, toolboxes, and real systems. The software must adhere to a recognized legal license, such as OSI approved licenses. Importantly, the software will be a full publication that is able to capture your software updates as and once they are released. To fully acknowledge the author's/developers software work your software will be fully citable as an Original Software Publication, archived and indexed and available as a complete online "body of work" for other researchers and practitioners to discover.

See the detailed Submission instructions, and more information about the process for academically publishing your Software: here

When preparing your manuscript, please make sure that you strictly adhere to the OSP Template for Original Software Publications and Software Update Template for updates to your Software.

The open access publication fee for Original Software Publications included in the Software Track of this journal is $500, excluding taxes. Software Updates referring to published Original Software Publications will be made open access free of charge.

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.

Experimental
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.

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.

Vitae
Submit a short (maximum 100 words) biography of each author, along with a passport-type photograph accompanying the other figures. Please provide the biography in an editable format (e.g. Word), not in PDF format.

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.

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

**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.
Units
Follow internationally accepted rules and conventions: use the international system of units (SI). If other units are mentioned, please give their equivalent in SI.

Math formulae
Present simple formulae in the line of 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). Note: When uploading a Word 2007 file containing mathematical equations, please check and make sure that the mathematical equations are properly processed when generating the PDF. If they are not, check out the instructions described on http://service.elsevier.com/app/answers/detail/a_id/302

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

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

A detailed guide on electronic artwork is available.

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

Formats
If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format. Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):
- EPS (or PDF): Vector drawings, embed all used fonts.
- TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
- TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
- TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

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

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

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 highly encouraged.

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. The [dataset] identifier will not appear in your published article.

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

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

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/neurocomputing
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: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.
Example: '..... as demonstrated [3,6]. Barnaby and Jones [8] obtained a different result ....'

List: Number the references (numbers in square brackets) in the list in the order in which they appear in the text.
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:

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 file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Data visualization

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

Supplementary material

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

**Research data**

This journal 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.

**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. 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.

**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 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 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