INTEGRATION
the VLSI Journal

TABLE OF CONTENTS

- Description p.1
- Audience p.1
- Impact Factor p.1
- Abstracting and Indexing p.2
- Editorial Board p.2
- Guide for Authors p.6

DESCRIPTION

Integration's aim is to cover every aspect of the VLSI area, with an emphasis on cross-fertilization between various fields of science, and the design, verification, test and applications of integrated circuits and systems, as well as closely related topics in process and device technologies. Individual issues will feature peer-reviewed tutorials and articles as well as reviews of recent publications. The intended coverage of the journal can be assessed by examining the following (non-exclusive) list of topics:

Specification methods and languages; Analog/Digital Integrated Circuits and Systems; VLSI architectures; Algorithms, methods and tools for modeling, simulation, synthesis and verification of integrated circuits and systems of any complexity; Embedded systems; High-level synthesis for VLSI systems; Logic synthesis and finite automata; Testing, design-for-test and test generation algorithms; Physical design; Formal verification; Algorithms implemented in VLSI systems; Systems engineering; Heterogeneous systems.

Benefits to authors

We also provide many author benefits, such as free PDFs, a liberal copyright policy, special discounts on Elsevier publications and much more. Please click here for more information on our author services.

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

AUDIENCE


IMPACT FACTOR

2019: 1.214 © Clarivate Analytics Journal Citation Reports 2020
ABSTRACTING AND INDEXING

Science Citation Index
Cambridge Scientific Abstracts
Computer Abstracts
Current Contents - Engineering, Computing & Technology
Engineering Index
EURASIP Newsletter
CompuScience
Zentralblatt MATH
Scopus
INSPEC
Current Contents
Research Alert
Web of Science
Science Citation Index Expanded

EDITORIAL BOARD

Editor-in-Chief
S.X.-D. Tan, University of California Riverside Department of Electrical and Computer Engineering, Winston Chung Hall, Riverside, California, CA 92521, United States
Interconnect degradation

Former Editor-in-Chief
F.V. Fernandez, Institute of Microelectronics of Sevilla

Special Content Editor
Xin Li, Duke University, Durham, North Carolina, United States

Subject Editor, Algorithms and Architecture
M.A. Bayoumi, University of Louisiana Center for Advanced Computer Studies, P.O. Box 44330, Lafayette, Louisiana, LA 70504-4330, United States

Subject Editor, System-Level Design and High-Level Synthesis
L. Stok, IBM Thomas J Watson Research Center, 19 Skyline Drive, Yorktown Heights, NY 10532, New York, USA

Subject Editor, Digital, Analog and Mixed Signal Design
F.V. Fernandez, Institute of Microelectronics of Sevilla, Avda Americo Vespucio s/n, E-41092, Sevilla, Spain
S.X.-D. Tan, University of California Riverside Department of Electrical and Computer Engineering, Winston Chung Hall, Riverside, California, CA 92521, United States

Subject Editor, Implementations and Layout Synthesis
R.H.J.M. Otten, University of Technology Eindhoven Department of Electrical Engineering, Postbus 513, 5600 MB, Eindhoven, Netherlands

Subject Editor, IP Integration and Reuse
W. Rosenstiel, Eberhard Karls University Tubingen Wilhelm-Schickard-Institute for Computer Science, Raum 119 Sand 13, 72076, Tubingen, Germany

Subject Editor, Embedded, Reconfigurable and Cyberphysical Systems
U. Schlichtmann, Technical University of Munich Department of Electrical and Computer Engineering, Theresienstr. 90, 80333, Munich, Germany

Subject Editor, Low-Power Circuits and Systems
N. Chang, Korea Advanced Institute of Science and Technology, Daejeon, South Korea

Associate Editors
H. Amrouch, Helmholtz Nuclear Research Centre Karlsruhe, Karlsruhe, Germany
• VLSI reliability, Low-power, Thermal-aware design, FPGA, Circuit aging
P. Brisk, University of California Riverside, Riverside, California, United States
• FPGAs and reconfigurable computing, Application-specific processors, Microfluidics, Cyber-physical Systems
Y. Cai, Tsinghua University, Beijing, China
- Physical Design, Power Analysis, Design for manufacturability, 3D IC Design.

**B. Carrion Schafer**, University of Texas at Dallas Department of Electrical and Computer Engineering (ECE), Richardson, Texas, United States
- High-Level Synthesis, Hardware Security, Design Space Exploration, Reconfigurable Computing, FPGA (Field Programmable Gate Arrays)

**L. Cassano**, Polytechnic University of Milan, Milano, Italy
- Fault diagnosis and tolerance, Reconfigurable computing, Fault testing and simulation, Hardware security, Formal verification

**R. Castro-Lopez**, University of Seville, Sevilla, Spain
- Analog/RF/Mixed-Signal design automation, Analog/Mixed-Signal Modeling, Analog/RF Physical Design and Synthesis

**H. Chen**, Shanghai Jiao Tong University - Fahua Campus, Shanghai, China
- VLSI reliability; Machine learning and neuromorphic computing; Numerical analysis and modeling for VLSIs; Integrated circuit for signal and control systems.

**H. Chen**, Wright State University, Dayton, Ohio, United States
- Digital wideband receiver, Tunable band pass filter, Active inductor, VLSI testing.

**G. Dündar**, Bogazici University Department of Electrical and Electronics Engineering, Istanbul, Turkey
- Analog Integrated Circuit Design, Design Automation for Analog Circuits

**A. Fish**, Bar-Ilan University, Ramat Gan, Israel
- Energy efficient digital ICs, Hardware security, Embedded memories, Alternative logic families

**Q.J. Gu**, University of California Davis, Davis, California, United States

**T.Y. Ho**, National Tsing Hua University, Hsinchu, Taiwan
- Microfluidic (lab on chip), Cyber physical system, Hardware security, Physical design

**N. Horta**, University of Lisbon, Lisbon, Portugal

**T. Ishihara**, Nagoya University, Nagoya, Japan
- Low power digital design, Optical circuit design and computing

**L. Jiang**, Shanghai Jiao Tong University, Shanghai, China
- Fault tolerant computing, Emerging technology, Neuromorphic computing, Approximate computing, Computer architecture

**Y. Jin**, University of Florida, Gainesville, Florida, United States
- Hardware security, Trusted IC design, Secure supply chain, Hardware-oriented cybersecurity, IoT security.

**T. Kim**, Seoul National University Department of Electrical and Computer Engineering, Seoul, Korea, Republic of
- Logic and physical synthesis, Low power design, Clock networks

**T. Kim**, University of California Riverside, Riverside, California, United States

**C.-K. Koh**, Purdue University, West Lafayette, Indiana, United States
- Physical design and circuit modeling

**M. Lanuzza**, University of Calabria, Rende, Italy
- Ultra low-voltage circuit design, Hardware security, Arithmetic circuits, Digital/analog design in emerging technologies (spintronics, TunnelFet)

**B. Li**, Technical University of Munich, Munchen, Germany
- Timing Analysis and Optimization; Statistical Modeling and Optimization; Design and Test for Microfluidic Biochips; Asynchronous Circuits; Physical Design; Hardware Security; FPGA Design and Reconfigurable Computing; Network-on-Chips

**S.P. Mohanty**, University of North Texas, Denton, Texas, United States

**F. Moradi**, Aarhus University, Aarhus, Denmark
- Low power IC design, Nano-scale Memory Design (CMOS, FinFET and spintronics), Biomedical IC Design, Nano-scale IC design, Analog Mixed-Signal IC Design

**S. Nakatake**, The University of Kitakyushu, Kitakyushu, Japan
- Physical design, Combinatorial algorithm, Analog layout, Analog circuit design, A/D converter, Sensor system

**N. Nedjah**, Rio de Janeiro State University, Rio de Janeiro, Brazil
- Network-on-chip, Reconfigurable hardware, Bio-inspired architectures
V.F. Pavlidis, The University of Manchester, Manchester, United Kingdom
• On-chip interconnects, 3-D ICs, Clock distribution networks, Power distribution networks

G. Qu, University of Maryland at College Park, College Park, Maryland, United States
• Hardware security, Trusted IC, Intellectual property protection, Low power

E. Ragonese, University of Catania, Catania, Italy
RF integrated circuits (ICs), mm-wave ICs, isolated dc-dc converters, radar sensors

S. Reda, Brown University, Providence, Rhode Island, United States
• Energy-efficient computing systems, Low power, Thermal management, CAD

F. Rodríguez Henríquez, Center for Research and Advanced Studies of the National Polytechnic Institute, Ciudad de Mexico, Mexico
• Security, Cryptography and Computer architecture, Reconfigurable computing

C. Sánchez López, Autonomous University of Tlaxcala, Tlaxcala, Mexico
• Analog Integrated Circuit Design, Design Automation for Analog Circuits, Memristive circuits and applications, Low-power and RF electronics design, Multiobjective optimization

G. Shi, Shanghai Jiao Tong University - Fahua Campus, Shanghai, China
• Analog/mixed-signal IC design, Design automation tools, Emerging devices and systems, Low-power analog/mixed-signal design, VLSI synthesis tools

Y. Shi, University of Notre Dame, Notre Dame, Indiana, United States
• Low power design, Power integrity, Three-dimensional integration, Computer-aided design

G.C. Sirakoulis, Democritus University of Thrace Department of Electrical and Computer Engineering, Xanthi, Greece
• VLSI architecture, FPGA, Non-conventional computing, Emerging circuits and systems (memristive and quantum computing)

L. Sterpone, Polytechnic of Turin, Torino, Italy
• Fault tolerance, Reconfigurable computing, FPGA, VLSI designs, Radiation testing

A.G.M. Strollo, University of Naples Federico II, Napoli, Italy
• Arithmetic circuits, Approximate computing, Flip-flops

M. Tahoori, Karlsruhe Institute of Technology, Institute of Computer Engineering, Chair of Dependable Nano Computing, Karlsruhe, Germany
• VLSI Test, Nano computing, VLSI reliability, Fault tolerant computing, Reconfigurable computing

S. A. Tajalli, Federal Polytechnic School of Lausanne, Lausanne, Switzerland
• Ultra low power CMOS, Analog IC, Wireless transceivers, Serial links, Wide band PLL, Data converters

Y. Takashima, The University of Kitakyushu, Kitakyushu, Japan
• Physical layout algorithm, Floorplan, Placement, routing algorithm, Scheduling and timing

E. Tlelo-Cuautle, National Institute of Optical Astrophysics and Electronics, Puebla, Mexico
• Algorithms, Methods and tools for modeling, Simulation, Synthesis and verification of integrated circuits and systems of any complexity, Circuit optimization

C.-Y. Tsui, Hong Kong University of Science and Technology Department of Electronic and Computer Engineering, Kowloon, Hong Kong

Y. Wang, Syracuse University, Syracuse, New York, United States
• Low-power electronics design; CAD for low-power and high performance systems; Neuromorphic computing; Energy harvesting and storage.

R. Wille, Johannes Kepler University Linz, Linz, Austria
• Reversible circuits, Quantum computation, Microfluidics, Optical circuits, Quantum-dot cellular automata, Design automation, Synthesis, Verification, Testing, SAT solving

D. Wong, University of California Riverside, Riverside, California, United States
• Energy Efficiency, Approximate Computing, Computer Architecture, Reconfigurable Computing, GPUs

Q. Xu, The Chinese University of Hong Kong, New Territories, Hong Kong
• Fault-tolerant computing, Trusted computing, Sensor-based interactive systems, VLSI Testing

J. Yin, University of Macau, Taipa, Macao
• Analog/radio frequency design, PLLs and frequency synthesizers, Oscillators, Ultra-low-power radios

S. Yin, Tsinghua University, Beijing, China
• Reconfigurable computing, high level synthesis, Neural network processor, Energy efficient VLSI design

F.Y. Young, The Chinese University of Hong Kong Department of Computer Science and Engineering, Hong Kong, Hong Kong
• EDA, Physical Design, Placement, Routing, DFM

B. Yu, The Chinese University of Hong Kong, New Territories, Hong Kong
• Cyber physical system, Design for Manufacturing and Combinatorial Algorithm
H. Yu, Southern University of Science and Technology, Shenzhen, China
- Low power IoT sensor design, Analog modeling and simulation, 3D-IC and emerging technology

Q. Yu, University of New Hampshire, Durham, New Hampshire, United States
- Hardware security, Fault tolerance, Networks-on-Chip

W. Yu, Tsinghua University, Beijing, China
Modeling and Simulation of Interconnects, Circuit Simulation, Power Analysis, Thermal Aware Design, Optimization and Machine Learning

C. Zhuo, Zhejiang University, Hangzhou, China
- Low power, Power and signal integrity, 3D IC, Cross-layer design and optimization, Design for reliability
GUIDE FOR AUTHORS

Types of contributions

Integration's aim is to cover every aspect of the VLSI area, with an emphasis on cross-fertilization between various fields of science, and the design, verification, test and applications of integrated circuits and systems, as well as closely related topics in process and device technologies. Individual issues will feature peer-reviewed tutorials and articles as well as reviews of recent publications. The intended coverage of the journal can be assessed by examining the following (non-exclusive) list of topics:

Specification methods and languages; Analog/Digital Integrated Circuits and Systems; VLSI architectures; Algorithms, methods and tools for modeling, simulation, synthesis and verification of integrated circuits and systems of any complexity; Embedded systems; High-level synthesis for VLSI systems; Logic synthesis and finite automata; Testing, design-for-test and test generation algorithms; Physical design; Formal verification; Algorithms implemented in VLSI systems; Systems engineering; Heterogeneous systems.

Original research papers and special issue papers can be submitted. For special issues, check that the submission is completed before the issue deadline. Review articles may also be published at intervals, but the subject and content of the latter should first be discussed with the Editor.

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 competing 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 competing interest statement using this template and upload to the submission system at the Attach/Upload Files step. **Note: Please do not convert the .docx template to another file type. Author signatures are not required.** If there are no interests to declare, please choose the first option 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. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

**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.

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

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

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

**Full online submission**
All manuscripts and any supplementary material should be submitted via the journal's online submission and peer-review systems at https://www.evise.com/profile/api/navigate/VLSI. Please follow the instructions given on this site. The system automatically converts source files to a single Adobe Acrobat PDF version of the article, which is used in the peer-review process. Please note that even though manuscript source files are converted to PDF at submission for the review process, these source files are needed for further processing after acceptance. All correspondence, including notification of the Editor's decision and requests for revision, takes place by e-mail and via the author's homepage.

**IMPORTANT NOTE:** In case you submit a special issue paper that will be handled by a designated Special Issue Guest Editor, please follow the instructions below:

1. Author registers in EVISE (follow the instructions on the site)
2. Select: Submit Manuscript from Main Menu
3. When choosing Article Type please select the title of the special issue you are submitting to

From then on follow the steps as laid out in EVISE. The manuscript is submitted to the Editorial Office who then assigns it to the Guest Editor in charge of that specific special issue.

**Referees**
Please submit, with the manuscript, the names, addresses and e-mail addresses of up to 5 potential referees. Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

**PREPARATION**
Peer review
This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. More information on types of peer review.

Use of Word Processing Software
It is important that the file be saved in the native format of the word processor used. The main text should be in double-column format (89mm width and 243mm length per column). Use single-spaced lines for main text. Use 10pt font for normal text. Keep the layout of the text as simple as possible. 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. To avoid unnecessary errors you are strongly advised to use the "spell-check" and "grammar-check" functions of your word processor.

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

Abstract
A concise and factual abstract is required (maximum length 100 words). 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.

Keywords
Important Notice: please add three to five keywords to your article. Keywords are essential for the accessibility and retrievability of your article. It is planned to make keywords available on Internet. To maximize the consistency with which such keywords are assigned by different authors, the following guidelines have been drawn up.

• Each keyword (which can be a phrase of more than one word) should describe one single concept. Often words like "and" or "of" should be avoided.
• Avoid very general keywords which become meaningless once in a keyword list. Examples to avoid are "action", "computer", "mathematics". Check whether the keywords as a whole describe the outlines of the article.
• Try to use nouns and adjectives as much as possible (i.e. use "automatic error recovery" rather than "recovering errors automatically"). Do not use nouns in the plural form.
• Use English rather than American spelling (regardless of the spelling used for the article itself).
• Avoid the use of abbreviations as much as possible, unless an abbreviation is so well-established that the full term is rarely used (e.g. use "laser" instead of "Light Amplification by Stimulated Emission of Radiation", but use "computer aided design" instead of "CAD").

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.
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.

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).

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.).

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/integration-the-vlsi-journal
When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.
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:

Vitae

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

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.

Electronic artwork

General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Save text in illustrations as "graphics" or enclose the font.
- Only use the following fonts in your illustrations: Arial, Courier, Times, Symbol.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Produce images near to the desired size of the printed version.
- Submit each figure as a separate file.

A detailed guide on electronic artwork is available on our website:
https://www.elsevier.com/artworkinstructions

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 finalised, 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: Vector drawings. Embed the font or save the text as "graphics".
- TIFF: color or grayscale photographs (halftones): always use a minimum of 300 dpi.
- TIFF: Bitmapped line drawings: use a minimum of 1000 dpi.
- TIFF: Combinations bitmapped line/halftone (color or grayscale): a minimum of 500 dpi is required.

DOC, XLS or PPT: If your electronic artwork is created in any of these Microsoft Office applications please supply "as is".

Please do not:

- Supply files that are optimised for screen use (like 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.

**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.

**Color artwork**

Please make sure that artwork files are in an acceptable format (TIFF, EPS 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 on the Web (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 on the Web only. For further information on the preparation of electronic artwork, please see https://www.elsevier.com/artworkinstructions.

Please note: Because of technical complications which can arise by converting color figures to "gray scale" (for the printed version should you not opt for color in print) please submit in addition usable black and white versions of all the color illustrations.

**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**

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

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

**Offprints**

The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. 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