



DIGITAL INVESTIGATION

The International Journal of Digital Forensics & Incident Response

AUTHOR INFORMATION PACK

TABLE OF CONTENTS

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



ISSN: 1742-2876

DESCRIPTION

Digital Investigation covers a broad array of subjects related to crime and security throughout the computerized world.

The primary pillar of this publication is digital evidence, with the core qualities of provenance, integrity and authenticity.

This widely referenced publication promotes innovations and advances in utilizing digital evidence for legal purposes, including criminal justice, incident response, cyber-risk management, civil and regulatory matters, and privacy protection.

Relevant research areas include forensic science, computer science, data science, artificial intelligence, and smart technology.

This journal is used by investigative agencies and forensic laboratories, computer security teams, practitioners, researchers, developers, and lawyers from industry, law enforcement, government, academia, and the military to share their knowledge and experiences, including current challenges and lessons learned in the following areas:

Research and development: Novel research and development in forensic science, computer science, data science, and artificial intelligence applied to digital evidence and multimedia. New methods to deal with challenges in digital investigations, including applied research into analyzing digital evidence and multimedia, exploiting specific technologies, and into preparing for and responding to computer security incidents.

Cyber-risk management: Improved ways of using digital evidence to address security breaches involving information systems, and to perform cyber threat intelligence. The techniques and findings of digital investigations are essential in drawing post-incident conclusions, which are vital feedback components of the security policy development process.

Practitioner reports: Investigative case studies and reports describing how practitioners are dealing with emerging opportunities and challenges in cybercrime and computer security, including improved methods for conducting effective digital investigations, performing forensic analysis, responding to IT security incidents, and handling and utilizing digital evidence.

Scientific practices: Novel approaches to strengthening the scientific foundation and rigor of digital investigations, and to increasing the reliability of and confidence in processes, analysis methods, results, and conclusions involving digital evidence.

Effective practices: Studies that assess new practices in digital investigations and propose effective approaches to handling and processing digital evidence.

Survey papers: Discussion of current methods and future needs relevant to digital investigations, including analysing digital evidence and multimedia from computers, smart technology, mobile phones, memory, malware, network traffic, as well as systems that support enterprises, telecommunications, and satellites. In addition, advanced approaches to analysing digital evidence and multimedia, including novel applications of artificial intelligence and data analytics.

Tool reviews: Evaluation and comparison of specialized software and hardware used to preserve, survey, examine, analyse or present digital evidence and multimedia, deepening our understanding of specific tools, and highlight any needed enhancements.

Future challenges: Analysis of new technologies, vulnerabilities and exploits which may create opportunities for criminality and/or computer security incidents, but which require further work in order to determine how their use can be investigated and the evidential opportunities they may create.

Registered reports: Studies that assess methods critically, and evaluating the reliability, statistical power, and reproducibility of results. Such reports can include tests and experiments with negative results, not just positive.

Legal analysis and updates: Carefully considered commentary by legal experts on recent cases involving digital evidence, forensic applications and computer security risk management, relevant legal developments, privacy issues, and legislative limitations.

AUDIENCE

Digital Investigation will be essential reading for: Auditors, Information Security Officers, Forensic Accountants, Information Systems Managers, Independent Investigators, Lawyers, Fraud Examiners, Law Enforcement Officials, Systems and Data Security Analysts.

IMPACT FACTOR

2016: 1.774 © Thomson Reuters Journal Citation Reports 2017

ABSTRACTING AND INDEXING

Current Contents/Engineering, Computing & Technology

Engineering Index

Scopus

Science Citation Index Expanded

EDITORIAL BOARD

Editor-in-Chief:

Eoghan Casey, Faculty of Law, Criminal Sciences and Public Administration, School of Criminal Sciences, University of Lausanne, Lausanne, Switzerland

Handling Editors:

Zeno Geradts, Nederlands Forensisch Institute, Rijswijk, Netherlands

Bruce Nikkel, UBS AG, Zürich, Switzerland

Legal Panel:

Chris Kelly, Massachusetts, USA

Bert-Jaap Koops, Tilburg, Netherlands

Marco Provierdera, New York, USA

Brian Roux, Hanry Law

Giuseppe Vaciano, Milano, Italy

Ian Walden, London, UK

Editorial Board:

David Baker, The Mitre Corporation, McLean, Virginia, USA

Brian Carrier, Basis Technology, Cambridge, Massachusetts, USA

Michael Cohen, Google, Inc., New York, New York, USA
Geoff Fellows, LG Training Partnership, Flore, Northamptonshire, England, UK
Pavel Gladyshev, University College Dublin, Belfield, Dublin 4, Ireland
Chris Hargreaves, Cranfield University, Swindon, UK
Hans Henseler, University of Applied Sciences Leiden / Tracks Inspector
David-Olivier Jaquet-Chiffelle, Université de Lausanne, Lausanne, Switzerland
Nigel Jones, Technology Risk Limited, London, England, UK
Troy Larson, Microsoft Research, Redmond, Washington, USA
Angus Marshall, n-gate ltd, UK
Golden Richard III, Louisiana State University, Louisiana, USA
Vassil Roussev, University of New Orleans, New Orleans, USA
Bradley Schatz, Schatz Forensic, Brisbane, Queensland, Australia
Peter Sommer, London School of Economics, London, UK
Philip Turner, Hewlett Packard, UK, England, UK
Henry Wolfe, University of Otago, Dunedin, New Zealand

Board of Referees:

Frank Adelstein, Architecture Technology Corporation New York (ATC-NY), Ithaca, New York, USA
Cory Altheide, Google, Inc., USA
Philip Anderson, Northumbria University Newcastle
Olga Angelopoulou, University of Hertfordshire, Hertfordshire, England, UK
Andre Bangerter, Bern Fachhochschule, Biel-Bienne, Switzerland
Andrew Barnes, UK Home Office, UK
Justin R Bartshe, Naval Criminal Investigative Service
Nicole Beebe, University of Texas at San Antonio, San Antonio, Texas, USA
Suman Beros, SEC ITFL
Raoul Bhoedjang, Netherlands Forensic Institute, The Hague, Netherlands
David Billard, HEG - School of Business Administration, Switzerland
Georg Blome
Alexandre Borges, Black Storm Security
Owen Brady, UK Financial Services Regulator
Frank Breitinger, University of New Haven, West Haven, Connecticut, USA
Susan Brenner, University of Dayton, Dayton, Ohio, USA
Sam Brothers, US Customs and Border Protection
Ian Bryant, Centre for the protection of Infrastructure (CPNI), London, UK
Emlyn Butterfield, Leeds Beckett University, Leeds, England, UK
Federico Cervelli, Reparto Investigazioni Scientifiche Carabinie, Parma, Italy
Yoan Chabot, Orange Labs, Belfort, France
Kim-Kwang Raymond Choo, University of Texas at San Antonio, San Antonio, Texas, USA
Fred Cohen, All.Net & Affiliated Companies, Livermore, California, USA
David A. Dampier, Mississippi State University
Suvrojit Das, National Institute of Technology Durgapur, India
Patrick De Smet, Institut National de Criminalistique et Criminologie, Brussels, Belgium
Ali Dehghantanha, University of Salford, Manchester, UK
Jason Doyle, National Cyber Investigative Joint Task Force
Denis Edgar-Nevill, Canterbury Christ Church University, Canterbury, England, UK
Tobias Eggendorfer, Eggendorfer IT-Beratung & Datenschutz
Mattia Epifani, Reality Net
Barry Foster, Standard Chartered Bank
Virginia N. L. Franqueira, University of Derby, Derby, UK
Eric Freyssinet, Pôle Judiciaire De La Gendarmerie Nationale
Ian Fulton, Forensic Science Northern Ireland, Carrickfergus, County Antrim, Northern Ireland, UK
Benjamin Fung, Concordia University, Montreal, Quebec, Canada
Simson Garfinkel, National Institute of Standards and Technology (NIST)
Thomas Gloe, Technische Universität Dresden, Dresden, Germany
Kate Greenwood, UK Financial Conduct Authority
George Grispos, Lero - The Irish Software Research Centre
Justin Grover, The Mitre Corporation, McLean, Virginia, USA
Irvin Homem, Stockholms Universitet, England, UK
Chet Hosmer, WetStone Technologies, Inc, Ithaca, New York, USA
Solal Jacob, ArxSys SAS, France
Joshua I. James, Hallym University, Chuncheon, Gangwon-do, South Korea
Andy Johnston, University of Maryland, Maryland, USA
Jim Jones, George Mason University, Fairfax, Virginia, USA
Costas Katsavounidis, 3K Ventures
Jim Kempvane, LogicForce
Gary Kessler, Gary Kessler Associates, Burlington, Vermont, USA

Coert Klaver, Netherlands Forensic Institute, Den Haag, Netherlands
Christopher Kollmann, Baltimore County Police Department, Towson, USA
Jesse Kornblum, Facebook, Menlo Park, California, USA
Kenji Kurosawa, National Research Institute of Police Science, Chiba, Japan
Frank Law, Hong Kong Police Force, Wanchai, Hong Kong
Rob Lee, SANS Institute, Bethesda, Maryland, USA
Andrina Y.-L. Lin, Ministry of Justice Investigation Bureau
Kevin Manson, Cybercop Portal, Arlington, Virginia, USA
Andrew Marrington, Zayed University, Dubai, United Arab Emirates
Ben Martini, University of South Australia, Adelaide 5001, South Australia, Australia
Vico Marziale, Blackbag
Bryan McCaffrey, Ambient Data
David McClelland, University of Edinburgh, Edinburgh, Scotland, UK
Keith McDonald, National Technical Assistance Centre (NTAC), London, UK
Robert Jan Mora, Shell Information Technology International B.V
Holger Morgenstern, Sachverstaendigen-Buero Morgenstern (Sachverständigen-Büro Morgenstern), Gammertingen, Germany
Srinivas Mukkamala, New Mexico Tech, Socorro, New Mexico, USA
George Noel, Affiliation Defense Information Systems Agency
Erika Noerenberg, Logrhythm
Owen O'Connor, Cernam Ltd, Dublin, Ireland
Jan-Jaap Oerlemans, Leiden University, Leiden, Netherlands
Richard Overill, King's College London, London, England, UK
Yin Pan, Rochester Institute of Technology, Rochester, New York, USA
Jungheum Park, National Institute of Standards and Technology (NIST)
Gilbert L. Peterson, U.S. Air Force Institute of Technology, Ohio, USA
Emmanuel Pilli, MNIT, Jaipur, Rajasthan
Ryan Pittman, NASA Office of Inspector General Computer Crimes Division, Ames Research Center, California, USA
Darren Quick, University of South Australia, South Australia, Australia
Alexander Rasin, DePaul University, Illinois, USA
Indraskhi Ray, Colorado State University, Fort Collins, Colorado, USA
Frederick Rehault, Pôle Judiciaire De La Gendarmerie Nationale, ROSNY SOUS BOIS CEDEX, France
Mark Roeloffs, Netherlands Forensic Institute, The Hague, Netherlands
Curtis Rose, Curtis W. Rose & Associates LLC, Laurel, Maryland, USA
Mark Russinovich, Microsoft Research, Redmond, Washington, USA
Julie Ryan, National Defense University, USA
Paul Sanderson, Sanderson Forensics Ltd., Bicester, England, UK
Mark Scanlon, University College Dublin, Ireland
Ruud Schramp, Netherlands Forensic Institute
Andreas Schuster, Deutsche Telekom AG, Bonn, Germany
Kathryn Seigfried-Spellar, Purdue University, West Lafayette, Indiana, USA
Eric Shaw, Elliot School of International Affairs, George Washington University, Washington DC, USA and Institute of Contemporary Psychotherapy and Psychoanalysis, Stroz Friedberg, USA
Todd Shipley, Vere Software, Reno, Nevada, USA
Thomas Souvignet, Institut de Recherche Criminelle de la Gendarmerie Nationale (IRCGN), France
Iain Sutherland, University of Glamorgan, Rhondda Cynon Taff, WALES, UK
Joe Sylve, Blackbag
Gergely Tapolyai, DC3 Defense Cyber Investigations Training Academy (DCITA)
John Thackray, Thackray Forensics Ltd., Onerahi, Whangarei, New Zealand
Vrizlynn Thing, Institute for InfoComm Research, Singapore
Ben Turnbull, University of South Australia, Adelaide, South Australia, Australia
Harm van Beek, Netherlands Forensic Institute, The Hague, Netherlands
Ronald Martijn van der Knijff, Netherlands Forensic Institute, The Hague, Netherlands
Erwin van Eijk, Netherlands Forensic Institute, The Hague, Netherlands
Jan Peter van Zandwijk, Netherlands Forensic Institute, The Hague, Netherlands
Bart Vanautgaerden, NATO Headquarters, Brussels, Belgium
Cor Veenman, Netherlands Forensic Institute, The Hague, Netherlands & Leiden University, Leiden, The Netherlands
Hein Venter, University of Pretoria, South Africa
Tim Vidas, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA
Rob Zirnstein, Forensic Innovations, Inc.

GUIDE FOR AUTHORS

INTRODUCTION

Digital Investigation is an international practitioner & research journal, and offers:

- A platform for pioneering peer-reviewed research papers
- Best-practice reports from the real experiences of investigators and lawyers
- New developments in the field of digital forensic science
- The latest proven methodologies being applied by the community

The journal brings together the growing global community interested in digital forensics, encompassing law enforcement, research, corporate information security, legal professionals and government.

Types of Paper

Original submissions on all digital forensic topics are welcomed, especially those of practical benefit to the investigator.

Papers are welcomed from the following categories:

Research:

Theoretical - Discovery and experimentation of digital forensic principles.

Applied - Tailoring of "agreed upon" principles into procedures that can be easily implemented for conducting network, computer and software forensics, to build a corroborated chain of evidence.

Practice:

Methods and tools for conducting effective digital investigations

Legal:

Legislative developments and limitations, new defences, and privacy

Standards, Policy & Ethics:

Overarching considerations, accreditation and certification

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. If there are no conflicts of interest then please state this: 'Conflicts of interest: none'. [More information](#).

Submission declaration and verification

Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see '[Multiple, redundant or concurrent publication](#)' section of our ethics policy for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service [CrossCheck](#).

Changes to authorship

Authors are expected to consider carefully the list and order of authors **before** submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only **before** the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the **corresponding author**: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors **after** the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

Copyright

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

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

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

Author rights

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

Elsevier supports responsible sharing

Find out how you can [share your research](#) published in Elsevier journals.

Role of the funding source

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

Funding body agreements and policies

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

Open access

This journal offers authors a choice in publishing their research:

Open access

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

Subscription

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

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

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

Creative Commons Attribution (CC BY)

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

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

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

The open access publication fee for this journal is **USD 2400**, excluding taxes. Learn more about Elsevier's pricing policy: <http://www.elsevier.com/openaccesspricing>.

Green open access

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

This journal has an embargo period of 24 months.

Elsevier Publishing Campus

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

Language (usage and editing services)

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

Submission

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

Submit your article

Submission for all types of manuscripts to Digital Investigation proceeds totally online. Via the Elsevier Editorial System Website for this journal at <https://www.evise.com/evise/jrnl/DIIN>, you will be guided stepwise through the creation and uploading of various files. When submitting a manuscript to Elsevier Editorial System, authors need to provide an electronic version of their manuscript. For this purpose only original source files are allowed, (no PDF files). Authors should select a category designation for their manuscripts (article, priority communication, research note, etc.)

PREPARATION

Peer review

This journal operates a double 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 detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should 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.

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. 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 the e-mail address is given and that contact details are kept up to date by the corresponding author.**
- **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

Graphical abstract

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

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

Highlights

Highlights are a short collection of bullet points that convey the core findings of the article. Highlights are optional and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). You can view [example Highlights](#) on our information site.

Keywords

Immediately after the abstract, provide a list of 5-10 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, "and", "of"). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations

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

Acknowledgements

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

Formatting of funding sources

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

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

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

If no funding has been provided for the research, 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.

Nomenclature and units

Any measurements must be in SI (System Internationale) units.

Math formulae

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

Footnotes

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

Image manipulation

Whilst it is accepted that authors sometimes need to manipulate images for clarity, manipulation for purposes of deception or fraud will be seen as scientific ethical abuse and will be dealt with accordingly. For graphical images, this journal is applying the following policy: no specific feature within an image may be enhanced, obscured, moved, removed, or introduced. Adjustments of brightness, contrast, or color balance are acceptable if and as long as they do not obscure or eliminate any information present in the original. Nonlinear adjustments (e.g. changes to gamma settings) must be disclosed in the figure legend.

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:

<http://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/half-tone (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 embedded graphics in your wordprocessor (spreadsheet, presentation) document;
- 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.

All illustrations should be large enough to withstand 50% reduction and still be easily readable

Color artwork

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.** Please indicate your preference for color: in print or online only. [Further information on the preparation of electronic artwork.](#)

Figure captions

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

Text graphics

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

Tables

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

References

Citation in text

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

Web references

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Data references

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

Reference management software

Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support [Citation Style Language styles](#), such as [Mendeley](#) and [Zotero](#), as well as [EndNote](#). Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide.

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

<http://open.mendeley.com/use-citation-style/digital-investigation>

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: All citations in the text should refer to:

1. *Single author:* the author's name (without initials, unless there is ambiguity) and the year of publication;
2. *Two authors:* both authors' names and the year of publication;
3. *Three or more authors:* first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

Examples: 'as demonstrated in wheat (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999). Kramer et al. (2010) have recently shown'

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

Examples:

Reference to a journal publication:

Van der Geer J, Hanraads JAJ, Lupton RA. The art of writing a scientific article. *J Sci Commun* 2010;163:51–9.

Reference to a book:

Strunk Jr W, White EB. *The elements of style*. 4th ed. New York: Longman; 2000.

Reference to a chapter in an edited book:

Mettam GR, Adams LB. How to prepare an electronic version of your article. In: Jones BS, Smith RZ, editors. *Introduction to the electronic age*. New York: E-Publishing Inc; 2009. p. 281–304.

Reference to a website:

Cancer Research UK, *Cancer statistics reports for the UK*. <http://www.cancerresearchuk.org/aboutcancer/statistics/cancerstatsreport/>, 2003 (accessed 13.03.03).

Reference to a dataset:

[dataset] Oguro M, Imahiro S, Saito S, Nakashizuka T. Mortality data for Japanese oak wilt disease and surrounding forest compositions, *Mendeley Data*, v1; 2015. <https://doi.org/10.17632/xwj98nb39r.1>. Note shortened form for last page number. e.g., 51–9, and that for more than 6 authors the first 6 should be listed followed by "et al." For further details you are referred to "Uniform Requirements for Manuscripts submitted to Biomedical Journals" (*J Am Med Assoc* 1997;277:927–34) (see also [Samples of Formatted References](#)).

Journal abbreviations source

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

Video

Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the files in one of our recommended file formats with a preferred maximum size of 150 MB in total. Any single file should not exceed 50 MB. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including [ScienceDirect](#). Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our [video instruction pages](#). Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Supplementary material

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

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 statement

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

AudioSlides

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

Interactive plots

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

AFTER ACCEPTANCE

Online proof correction

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

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

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

Offprints

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

AUTHOR INQUIRIES

Visit the [Elsevier Support Center](#) to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.

You can also [check the status of your submitted article](#) or find out [when your accepted article will be published](#).

© Copyright 2014 Elsevier | <http://www.elsevier.com>