

Sample Paper for Complex Systems

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The abstract should summarize the content of the paper, including its context and conclusions. Make sure that it is possible to understand the abstract without having read the entire paper. Remember that many database systems will access the paper through keywords from the title and abstract. If possible, use the passive voice in the abstract ("X is shown," rather than "we show X"), but not if it leads to awkward sentence constructions. Try to keep the abstract below 150 words in length (and shorter for short papers). Do not have references or displayed equations in the abstract.

1. Introduction

The introduction is a crucial part of a paper. It should explain the background and goals, and should strive to be as widely accessible as possible. Jargon and abbreviations should be avoided. References to textbooks and other basic material should be given [1, 2, 3]. (If L^AT_EX is not used, references should be numbered in the order in which they appear in the text. A space should be left before the brackets used

The title serves as a headline for the paper: many readers use it to decide whether to look at the paper. Avoid excessively general, technical, or cutesy titles. Questions are acceptable as titles. Capitalize the first letters of important words only. Funding and personal acknowledgments go at the end of the paper. Use footnotes to the title only for statements such as "This paper was based on a talk given at the conference on..." or "Part 1 in this series of papers appeared in..."

[†]Authors are encouraged to give their first names and middle initials. Use footnotes to author names for statements such as "Present address:..." or "Electronic mail address: author@univ.edu." Titles and positions of authors should not be given or implied.

[‡]Give complete affiliation and mailing address, including country. Capitalize important words and proper names only. (Use standard two-letter abbreviations for state names.) For foreign addresses, give as much as possible in English.

to indicate a reference.) If an arbitrary choice out of many possible references is made, indicate it as (e.g., [3]).

Except for very short papers, division into sections is strongly encouraged. The first section need not necessarily be entitled "Introduction." There may be subsections as well as sections. The subsections may, but need not, be numbered. There should not be subsubsections. Only the first word and proper names should be capitalized in section titles.

2. Formatting systems

Authors are encouraged to send electronic media with their submission or after their paper has been accepted. We have chosen \LaTeX as the primary formatting system for *Complex Systems*.

\LaTeX is based on \TeX , which has emerged as a standard for formatting scientific documents. \LaTeX is a collection of definitions written in the \TeX language. It is described in *\LaTeX: A Document Preparation System* by Leslie Lamport (Addison-Wesley, second edition, 1994). These notes give some information on using \LaTeX . For further information, particularly on formatting equations and tables, refer to the book. Although we prefer that papers be submitted in \LaTeX or \TeX , we can also process papers that are in a variety of other formats. *Mathematica* notebooks, for example, are easily converted to \LaTeX .

If you prepare your paper using a format other than those mentioned, convert the file to ASCII format whenever possible. If control codes and special symbols are stored by the program as text strings, then save them in ASCII form as well. (For example, if the program stores a Greek α as a text string like `\alpha` rather than as a control sequence like `^A`.) Unless there are essentially no equations or other specially-formatted objects, papers containing commands for other formatting systems may have to be retyped, causing delays in processing.

3. The main text

Good English grammar is essential. Authors not fluent in English are strongly encouraged to have their grammar checked. American spelling should be used and, if possible, checked by computer. Colloquialisms such as "weren't" should never be used; nor should exclamation marks. *Emphasized* or special text should be italicized.

Spell out abbreviations, at least when they are first used. Spell out integers under 10 unless they are used with units of measure (i.e., write "two" rather than "2"). Italicize foreign language phrases, such as *ad hoc*. The abbreviations "e.g.," "i.e.," and "etc." should not be italicized, and should be used only in parenthetical material; spell out "for example," "that is," and "and so forth" (or equivalents) in regular text.

Cross-references can be made both to other sections in the paper¹ (e.g., section 1), and to specific pages in the text (e.g., page 66). Authors not using L^AT_EX must mark page references by hand in the master copy of their paper. The words “section” and “page” should be spelled out completely in references.

Lists of items should be preceded by a complete sentence and may be laid out as follows.

- Each item will be like a separate paragraph.
- Another item.

If a list of items is given in the text, such as (a) first item, (b) second item, and so forth, they should be indicated with parenthesized letters, arabic numerals, or roman numerals in italic type.

4. Equations and mathematical symbols

Consistent mathematical notation is essential to clear exposition. Try to use familiar notation (e.g., avoid having x stand for an integer index).

All standard mathematical symbols and notations must be formatted in equation form, whether in-line or displayed. Even standard English letters such as x must appear as x (mathematical font) if they correspond to mathematical symbols.

All displayed equations should be numbered sequentially:

$$e^{2^i} = 1. \tag{1}$$

Spaces should be inserted in equations where necessary to improve readability. Equations should be referred to as “equation (1).” In multiple-line equations, the number should be given on the last line. Short equations may be inserted directly in the text, as in $x = 2$. Equations that involve extensive subscripts, superscripts, or built-up objects should be displayed. Special symbols in equations must be strictly limited to those that can be produced with L^AT_EX using common fonts.

If a formatting system other than L^AT_EX or *Mathematica* is used, make sure that all symbols are very clearly identified, and that all subscripts and superscripts are evident. If a computer-readable form of the paper is to be transmitted, then write the equations in L^AT_EX form if possible. If only a hardcopy version is transmitted, it is better to type or write equations in the standard way than to give a partial computer version.

¹Footnotes should generally be avoided: points worth making should appear in the main text. Footnotes may give technical or methodological details, such as “The simulations were run on a particular computer, using programs written by Some Programmer in the C programming language.”

Complex Systems allows many kinds of notation. It is suggested that symbols or words related to actual or theoretical computers be indicated in typewriter font. Acronyms such as NP (as often used in computation theory) should be spelled out at their first use and given in capitals thereafter.

Great care should be taken in mixing plain English, mathematics, and algorithm descriptions. Say, for example, “ x is position” rather than “ $x =$ position.” Consistency must be maintained between different occurrences of a symbol. If x is a mathematical symbol, make sure it appears as x everywhere, not sometimes as x or as x . As a rough guide, mathematical symbols should appear as x and computer symbols as x .

Theorem 1. Theorems and other structured mathematical text should be used when it improves the presentation. They should not be a substitute for clear English exposition.

Proof. Proofs can continue for several paragraphs. They should end with a solid rectangle. ■

5. Figures and other displays

Figures are an excellent mechanism for communicating many kinds of results. Great care should be taken to produce clear, well-constructed figures. When there are many related graphs or images, they should usually be combined into a single figure. (Try to use glue, not tape, if you make such composites by hand.)

Figures should be displayed near where they are first mentioned in the text. (Even if you do not use \LaTeX , mark the suggested positions of figures.) Figures are numbered sequentially throughout the text. Figure 1 is an example. In text, refer to figures as “Figure 1,” for example.

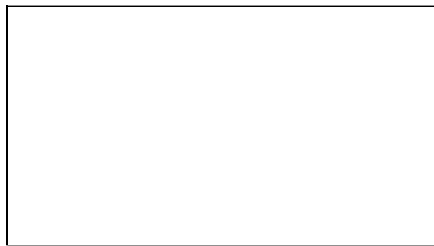


Figure 1. An example figure. The first sentence of a figure caption should serve as a title for the figure. The remainder should describe the figure in a way that does not rely on the main text of the paper. Many readers will look at the figures and their captions before reading the full text.

first	second	third part
data <i>more</i>	+ 1	end

Table 1. A sample table. Avoid using tables for numerical data; figures usually present such material more meaningfully. Also avoid putting extensive text into tables.

If possible, send your figures in electronic form; Encapsulated PostScript or standard PostScript are the most preferred file formats. Figures can also be processed in BMP, PICT, or TIFF format, but PostScript files are generally easier to reproduce. Simple line drawings produced using L^AT_EX should be included directly in the text. Complex line drawings produced using L^AT_EX should be sent as separate files.

Figures sent electronically should reproduce well (i.e., without noticeable aliasing) on a 300 dpi printer (such as the Apple LaserWriter). The PostScript form for a particular figure must include all elements of the figure, and should not require modification.

In some cases original figures sent by authors will be reproduced digitally in *Complex Systems*. It is therefore crucial that the original figures be of high quality. Lettering should be consistent in size throughout a figure, and must be no smaller than 9 point ($\frac{1}{8}$ letter height) when the figure is at final size. If possible, lettering should be made with standard L^AT_EX fonts, or with Times Roman. Lines should be thick enough that they do not break up under reduction (single-pixel lines rarely suffice). Filled black areas must not drop out. Computer-generated halftones should generally be avoided; if they are used, the original output should be sent.

Original figures should be sent with horizontal dimensions not exceeding 5.5 inches, and vertical dimensions not exceeding 8 inches. Whenever possible, the figures should be oriented in the same sense as text (portrait mode).

Black-and-white photographs should be sent as original prints; they will be reproduced using halftones. Multiple photographs in a single figure should be sent as a single print if possible.

The front cover of each journal issue uses artwork from one of the papers in the issue. Send candidate pictures separately and indicate them for possible use on the cover.

Computer programs or algorithm descriptions may be given either in equations or in figures. Literal expressions that occur as computer input or output should be given in typewriter font.

Tables should include captions similar to those for figures, and should be numbered sequentially throughout the paper. Tables should be en-

closed in single-line boxes. Tables must usually be oriented with the text. They should not contain type smaller than 8 point.

Acknowledgments

Acknowledgments should thank individuals and organizations for their contributions to the work. All funding information should be placed in the acknowledgments, not as a footnote on the first page. If acknowledgments imply some endorsement of the paper (e.g., "We thank X for checking...") make sure the parties involved approve the statements made.

Appendix

A. About the references

Appendices should be used to give detailed or background information related to the main text. Display equations in appendices should be numbered (A.1) and so forth.

$$e^{2i} = 1. \quad (\text{A.1})$$

References should give pointers to background material and related work, and should record credit due to other authors. It is better to give too many than too few references.

References are numbered sequentially throughout the text. Each item should be given a separate number (except when there are, for example, references to different pages in the same document: these should be indicated as "pages 3–56 in [2]" or "chapter 14 of [3]" in the text).

Full titles of papers should be given. They should be enclosed in quotation marks, with all important words capitalized. They should be followed by a comma inside the quotation marks.

To cater to a wide variety of disciplines, it is important that *all names of journals be spelled out in full*, and italicized. (Use *Physical Review Letters*, not *Phys. Rev. Lett.*, and *Journal of Computer and System Science*, not *J. Comput. Sys. Sci.*)

Give volume numbers in boldface (do not write the word "volume" explicitly). Include the issue number of the volume only if the journal is renumbered with each issue. If the issue number is necessary, place it in parentheses immediately following the volume number, but not in bold; for example, 4(1). Give dates in parentheses; include months only when necessary, spelling them out in full. Give starting *and ending* page numbers for papers.

Author names should be given as they appear in the original papers, with first names or initials first. (When initials are used, write them

as I. J. Name, with spaces after each period.) For papers with many authors, the names of the first three authors should be given in full, followed if necessary by "et al."

Titles of books (i.e., published material with ISBN numbers) should be italicized. Names and cities of publishers and dates of publication should always be given. Complete addresses should be given for small publishers. Conference proceedings that are distributed through ordinary publishers should be referenced like books.

Titles of proceedings and reports that are distributed in other ways should be given in full in the standard roman typeface. Information on how to obtain them should be given in parentheses. Pricing information should not be included.

Details of the nature of a referenced item can be given in square brackets. Computer program names should be given in typewriter or small caps font.

References

- [1] First Author and Second Author, "A Review Article," *Full Name of Journal*, volume (date) page–page.
- [2] I. J. Author, *A Book* (Common Publisher, city, date).
- [3] A. Author, "A Paper," in *A Collection*, edited by First Editor and Second Editor (Uncommon Publisher, full address, date).
- [4] A. Editor (editor), *A Book* (Common Publisher, city, second edition, date).
- [5] Proceedings of a Conference, held at location on date, edited by A. Editor (available from Name, address).
- [6] A. Author, "Title of Report," Report Type or Series, number (date) (available from Name, address).
- [7] A. Author, "Title of Preprint," Institution name, address (date if appropriate).
- [8] Company Name, Computer Program Reference Manual (available from Name, address).
- [9] First Author, "Future Paper," unpublished notes (date), (forthcoming in *Full Name of Journal*).
- [10] Name, "Title," talk given at Location (month day, year).
- [11] Name, A liation or Address, private communication (date).
- [12] Name, Program Name [computer program in specified language running on particular computer systems] (available from Organization, Address).