siam®

Style Manual

For journals and books

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Chapter 1

Basics of Copy Editing—SIAM and Otherwise

Many people wonder how one can successfully edit a high-level mathematics paper without understanding the math. The goal of this manual is to answer that question. Briefly, the SIAM copy editor should concentrate on editing papers for basic grammar, consistency of style, correct punctuation, and clear and concise syntax. In-text math and displayed equations should be edited as lightly as possible.

The most important consideration to bear in mind when editing is the Hippocratic oath: **First, do no harm**. SIAM is an organization whose purpose is to provide services for its members, which by extension includes subscribers and authors. Always keep in mind that we must put their needs first. The primary manifestation of that attitude is a light editorial hand. There are two reasons for this:

1. Changes may affect the content, so when in doubt, leave things alone.

2. Any change takes up the time of three people—the editor, the typesetter, and the proofreader. Is the change really worth it?

Almost all SIAM papers are prepared by the authors using one of the forms of TeX, a math typesetting system. Papers prepared in TeX are referred to as author-typeset (AT) papers. With TeX, authors are able to format the text and displayed mathematics in specific ways. SIAM has created macro packages (or style files) that authors are encouraged to use before submitting their TeX file. If the author has not used the macros, they are added at a stage before copy editing called preTeXing. Once the macros have been applied, the format and page layout of the paper will match the style of the printed journal, thus eliminating the need for the copy editor to mark type specs or format codes. The math in AT papers is changed as little as possible. The copy editor should work under the assumption that the author has set up the equations in a certain way for a reason. Changes to the math are made only if inconsistencies in setup or format exist within a paper, or under specific circumstances described in the sections that follow. Ask the question, "Is this clear and understandable the way it is?" If so, leave it alone.

In the rare instance when an author has not used a form of TeX when preparing the paper, it must be conventionally typeset. The approach to copyediting these conventional papers differs. The mathematical typesetting guidelines outlined in *Mathematics into Type* are followed, and care is spent marking specific elements for the compositor. There is more flexibility in making changes because the paper needs to be completely retyped in TeX.

1.1 Elementary rules of copy editing anywhere

- Look up the spelling of every unfamiliar term.

- When reference information is mentioned in text, double-check it against the bibliography.

- Keep a style sheet for consistency of formatting of terms. (At SIAM, this is the back of the cover sheet for journal articles.)

- Consult grammar sources regarding points about which you are unsure.

- Every publisher has its own style manual, which must be followed.

1.2 Additional elementary rules for copy editing at SIAM

- Any numbered item—theorem, reference, equation, and so on—should be checked against the back of the cover sheet to see whether it exists.

- Be vigilant of margin breaks and short or long pages.

- Always run a spell check after editing a TeX paper.

1.3 Parts of a SIAM paper

A SIAM journal article is made up of some or all of the following parts. This manual discusses in detail each of these parts of a paper. Because the SIAM macros include the type specifications and format the sections of the paper in a standard way, there are no individual journal specs.

- Topmatter
    1. title[1]
    2. slug lines[1]
    3. authors[1]
    4. running heads[1]
    5. first-page footnotes[1]
    6. dedication
    7. abstract[1]
    8. key words[1]

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[1] Indicates a required item.

9. AMS subject classifications

10. other subject classifications

11. digital object identifier (DOI)[1]

12. table of contents

13. notation

- Text[1]

- Section and Subsection Heads

- Series and Lists

- Mathematical Items

- Algorithms

- Footnotes

- Figures and Captions

- Tables

- Appendices

- Acknowledgments

- Note Added in Proof

- References

1.4   Approaching the Paper

Below is an outline of the approach you should take when copyediting a SIAM paper. As you become more proficient in editing and more familiar with SIAM style, you may vary this approach as long as the necessary steps, such as listing all numbered items on the back of the cover sheet and verifying all citations to them, are being done. The precopyediting tasks are performed by the Editorial Assistant when the paper is accepted, but they should be double-checked by the copy editor.

- **Precopyediting** (EA).

  1. Scan paper for completeness and legibility.
     - Check that all required parts are present and in the correct order.
     - Create an Acknowledgments section if necessary.
     - Make sure every page is present and legible.
     - Number (or renumber) the pages (including pages for figures, captions, and tables which may be at the end) if necessary.
     - List all gaps or problems and query on cover sheet.
     - Add the DOI.

  2. Set up first-page footnotes.

- Set up the article footnote, filling in submission date, acceptance dates, reviewing editor for SIMAX and SIADS, and section for SISC (2011 only for the last item).
- Locate author addresses and set up author footnotes, spelling out abbreviations and stetting acronyms if necessary.
- Locate information on grant support, previous publication, etc., and put into appropriate footnotes. Check last page of text; often the acknowledgment contains grant information.
- Note any missing information, such as zip code numbers, e-mail addresses, complete addresses for foreign authors, and unfamiliar granting agency abbreviations, on cover sheet.
- Add the URL information below the title footnote.

- **PreTEX QC** (done by copy editor if preTEX is done outside of the Editorial Department). Compare the preTEXed manuscript side by side with the accepted manuscript (sometimes called the "printer's copy").

  1. Do title and author names match? They may have been rekeyed, so check letter for letter for misspelling.

  2. Check topmatter items.

     - Is journal name in slugline correct?
     - Are footnote symbols in correct order, and does the footnote information correspond with the proper person?
     - Are abstract, key words, subject classifications, and DOI in the proper locations? Is **AMS subject classification** used if only one classification is present?
     - Are dates in title footnote correct?
     - Is URL present? Are journal abbreviation and manuscript number correct?
     - Are author footnotes set up properly?
     - Are running heads present? Does left-hand running head match byline (unless truncation is needed)? Does right-hand running head fit?

  3. Check numbering of math environments, equations, figures, and tables. Are there duplicate numbers? Note that the LATEX macros may have altered the author's numbering system; this change is acceptable as long as the corresponding in-text citations have changed accordingly.

  4. Look for special fonts in math, such as roman, boldface italic, boldface roman, fraktur, and script letters. These fonts should be maintained on the preTEXed copy. If these fonts have been lost, the file should be fixed and reprinted to restore them. Fake blackboard bold characters ($\mathbb{R}$) may have been changed to true blackboard bold ($\mathbb{R}$). If not, it can be marked at editing.

  5. Compare the figures with the originals. Do they match exactly?

  6. Compare the two reference sections. The number of references should be the same, as should the style: numbered, name and year (which is unnumbered), or alphanumeric abbreviation (e.g., [NH1]).

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7. Be sure that the LaTeX system of in-text citation to references, equation numbers, sections, math environments, figures, and tables has created proper cross-references. A problem will cause a **?** instead of the correct number.

8. Is the text substantially different from the original? If so, consult with the Publications Manager, because authors are not supposed to revise the paper once it's been accepted.

- **Copyediting**. Before you start, check folder for any relevant information or old copies of the accepted manuscript (e.g., an unpreTeXed copy).

    1. *First pass.* Determine organizational structure of paper. As you are doing the first pass, list all items on the back of the cover sheet.
        - Check the EA's work: first-page footnotes, cover sheet.
        - Check whether there are subsections as well as sections, and whether and which unnumbered subheadings should be treated as subsections.
        - Determine numbering system, e.g., are sections, subsections, or paragraphs numbered together with theorems, remarks, and equations; does numbering system run through the paper, or does it begin anew with each section? Are items within similar constructions treated similarly? List items, as well as the theorems, lemmas, algorithms, etc., they are part of (e.g., Theorem 2.1 (i)–(iii)).
            (a) If numbering system is inconsistent with SIAM style but consistent within itself and understandable, leave it alone.
            (b) If numbering system is inconsistent with itself, flag the inconsistency, decide on a solution, and query author.
        - Determine how elements of the paper are cited in text. If inconsistent with SIAM style or, more important, with the numbering system used in the paper, decide how to fix it. Query author via e-mail if your proposed fix will cause major changes to the paper or if there is any question as to the correctness of your changes.
        - Scan for presence and numbering of tables and figures. If they aren't consistent, determine how to make them so.

    2. *Second pass.* Edit and READ the manuscript. This is a line-by-line pass.
        - *Mark for SIAM style, as needed.* Check overall arrangement of text.
        - *Check and standardize grammar and spelling. List all decisions on back of cover sheet.*
            (a) Identify and list treatment of compound terms—are they hyphenated, are hyphens to be deleted, are they left open, are they closed up?—for conformity to SIAM style and for consistency within the paper. Mark occurrences in the paper accordingly.
            (b) Identify misspelled or inconsistently spelled words, including changing British to American spelling. Mark occurrences in the paper accordingly.

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(c) Determine abbreviated words and acronyms to be kept, made consistent, or spelled out at every occurrence. Note on the cover sheet the page on which the acronym or abbreviation was first defined to ensure that it wsn't used earlier.

(d) Note on back of cover sheet any other stylistic decisions on matters that can be done in more than one way—for example, *iff* or *if and only if*; *for all* or $\forall$; refs [1, 2, 3] or [1], [2], [3].

(e) Check overall grammar and English usage for correctness, especially for foreign authors. Note particular points to watch for.

(f) Run a spell check on the TeX file.

− *Check overall mathematical arrangement and notation and mark as needed.*

(a) Check that all numbering issues have been resolved or identified. Check every in-text citation against the cover sheet, e.g., if the author refers to Theorem 2.1(i), be sure it exists in the manuscript.

(b) Check all mathematical expressions. Have they been handled consistently? Count parentheses as you read along. Change awkward or inconsistent arrangement as appropriate.

(c) Note unknown, ambiguous, or confusing symbols. Resolve ambiguities if possible; list remaining problems for author query.

(d) Identify patterns in notation and arrangement, such as appearance of script or fraktur letters, use of both italic and roman variables, notation used to signal boldface type, use of $\times$ or $\cdot$ for multiplication or $\cup$ or $\bigcup$ for union.

(e) If an expression in text creates too much space between lines, slash fractions and add parens as needed, move subscripts, etc. Pay particular attention to summations and integrals. Mark expressions to be displayed if they cannot be made to fit properly.

(f) Note function names to be marked for roman type.

− *Set up tables and figures.*

(a) If necessary, indicate approximate placement in margins and proper arrangement of groups of figures.

(b) Mark alignment within tables if inconsistent. Add rules where needed. Mark TeX tables for type-size reduction if needed. Check for size—will tables fit within margins when reduced to 8-point type?

(c) Edit all captions.

(d) Highlight call-outs (primary in-text mentions) in yellow. Query author by e-mail if they are missing.

(e) Ensure that double-numbered figures (e.g., Figure 3.1) fall within the appropriate section. Change to single-numbering system if necessary to avoid huge changes to layout.

− *Mark references.*

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(a) Mark for style and punctuation. Look up all missing information in style manual, MathSciNet, ZMATH, scholar.google.com, or other sources. Query author on missing information that you cannot locate yourself. Query author for updates as needed.

(b) Check every in-text reference citation. Are the authors' names spelled the same in the text as in the reference section?

– *Check overall arrangement of text.* Check that all lists, subheadings, algorithms, etc. have been marked properly and consistently. Be vigilant of large margin breaks.

3. *Third pass.* Scan the paper again for anything not caught previously.

1.5 Advice from the American Mathematical Society

The AMS edits even more lightly than SIAM does. Here are some pointers from their style manual.

Wisdom consists of knowing when to avoid perfection.—source unknown

The general rule that covers all decisions is as follows: If it doesn't hinder readability and/or it doesn't look noticeably awkward, just leave as is.

- Sometimes the subject of a sentence is a full math expression containing a math verb. *Example*: As an algebra, $A = R \star H$ is the smash product $R \# H$, and as a coalgebra it is the smash coproduct, that is,

$$\triangle_A(r \star h) = \sum (r^1 \star (r^2)_{-1} h_1) \otimes ((r^2)_0 \star h_2).$$

- Sometimes the verb of a sentence is nestled in a math expression. If not read correctly, in some cases the sentence will appear to be lacking a verb, but it isn't. *Example*: Then $\text{dec}(F_{(\preceq_n)}) \geq \text{dec}(f)$ for any lsc $f : 2^w \to [0, 1]$.

- Long sentences are common and acceptable in math. Long sentences often contain conditions set off by commas. If read incorrectly, these sentences don't seem to make sense, but they do. *Example*: The conclusion will follow easily if we can show that if $\sigma_0, \ldots, \sigma_k \in 2^n$, $\sigma_0 \preceq_n \cdots \preceq_n \sigma_k$, and $l \leq k$, then there are $\tau_0, \ldots, \tau_{k+1} \in 2^m$ for some $m > n$ with $\tau_j | n = \sigma_j$ for $j \leq i$, $\tau_0 \preceq_m \cdots \preceq_m \tau_{k+1}$, and $\tau_i \neq \tau_{i+1}$.

- Don't change *since* to *because*.

- Keep the author's use of *which* and *that*.

- Don't add commas to a string of adjectives that doesn't already include commas, but don't delete the commas if the author has used them. *Example*: nonnegative nonincreasing continuous functions.

- Some authors like commas, and some don't. Even in nonmathematical writing, it is becoming more acceptable to not use commas after such things as introductory adverbial phrases that begin a sentence. If the author chooses not to use optional commas (for a discussion, see the remarks on "open" style in *Words into Type*), leave the manuscript as is; however, whenever the absence of a comma causes confusion, please add it. Some authors overdo it with commas, but you should eliminate only the ones that are clearly in error.

1.6 Miscellaneous hints

- Be careful about subject-verb "mismatches"; sometimes the real subject of a verb is not apparent. *Example*: The set of values that lie along the x-axis...; in this case, we don't know whether **lie** belongs to **set** or to **values**, so just stet.

- Questions of various kinds can often be resolved by consulting the originally accepted manuscript, because problems may have been inadvertently introduced at SIAM.

- Know the difference between a clause and a phrase; a clause contains a subject and a verb, whereas a phrase does not contain a finite verb. (See *Words into Type*, Glossary of Grammatical Terms, page 391.)

- Be aware that spacing between words is created automatically by TEX, accommodating different factors, and can be difficult to change manually. For example, there may be a larger-than-usual space between a section heading and the first words of text if those words can't be broken (e.g., "Through the..."). There is no need to change this space.

1.7 Resources

A good editor looks things up. Resources at SIAM to help you discover the unknown include the following.

- At your desk, you should have

    1. *Webster's Collegiate Dictionary*;

    2. *Chicago Manual of Style*, a good source on grammar and style for things not convered in this manual;

    3. *Mathematics into Type*, which covers a lot of rules about editing math—especially how to break and align equations;

    4. Higham's *Handbook of Writing for the Mathematical Sciences*—its title is self-explanatory;

    5. (if you're a production editor) several TEX books, which can provide advice on what TEX can and can't accommodate;

    6. the *Combined Membership List*, which could provide author-contact information—also information about locations of universities and research institutions;

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7. EJPress, for DOI numbers, author-contact information, received and accepted dates.

- The publications library holds

  1. *Ulrich's*, which is a directory of periodicals—use the index volume to look up unfamiliar journals;

  2. *Books in Print*, which can provide bibliographic information on books (and there's a volume listing names of publishers);

  3. copies of back issues of SIAM journals;

  4. dictionaries:
     - foreign-language dictionaries,
     - James and James's *Mathematics Dictionary*,
     - Eisenreich and Sube's *Dictionary of Mathematics*—doesn't provide definitions but is an excellent and extensive list of mathematical terms.

- The front library holds bound volumes of all journal issues.

- The new conference room holds copies of every book published by SIAM.

- The shelf inside the managing editor's office holds

  1. other TEX and PostScript manuals;

  2. other grammar resources, including *Words into Type*, *The New Well-Tempered Sentence*, and *The Deluxe Transitive Vampire*.

- Online resources include

  1. A Web of Online Dictionaries: www.yourdictionary.com—has links to many specialized dictionaries;

  2. The MacTutor History of Mathematics archive: www-groups.dcs.st-andrews.ac.uk/ history/index.html—has a list of mathematicians' names;

  3. a listing of mathematical publishers, with links to them: www.ams.org/mathweb/mi-publishers.html;

  4. university and institution Web sites;

  5. MathSciNet and Zentralblatt MATH Database, which can be used for clarifying or completing reference information and are also a good way to verify the existence and spelling of technical terms: www.ams.org/mathscinet and www.zentralblatt-math.org/zmath/en;

  6. search engines; try scholar.google.com for missing info for references.

Chapter 2

Topmatter

2.1 Title

- The title is all caps, bold, centered.

- An asterisk follows the title and refers to the first-page title footnote. Close up any extra space between the title and the asterisk.

- Ensure that spelling, hyphenation, en dashes, math, and symbols are consistent with the body of the paper. **Ensure that variables that are lowercase in the text are lowercase in the title.**

- The paper may be one of a series. In this case the title is of the form

A NUMERICAL METHOD FOR SURFACE WAVES IN A CYLINDRICALLY PERTURBED ELASTIC HALF-SPACE I: CONSTRUCTION AND ANALYSIS

or

A NUMERICAL METHOD FOR SURFACE WAVES IN A CYLINDRICALLY PERTURBED ELASTIC HALF-SPACE. PART 1: CONSTRUCTION AND ANALYSIS

or matches a previously published paper of the series if published in a SIAM journal. If possible, the other parts of the series should be handled at the same time to maintain consistency in editing conventions, especially the structure of the title of the paper.

- Common acronyms do not need to be spelled out in the title. Spell out acronyms not listed in Appendix B, but do not include the acronym itself in the title.

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2.2 Authors

- Author names are all caps, 8 point, and set centered below the title. (Don't worry about making the *c* or *ac* in names beginning with *Mc* or *Mac* smaller.) The word *and* is in small caps. Each name is followed by a footnote symbol, in this order: †, ‡, §, ¶, ‖, #; repeat each symbol doubled for more than six names. These refer to the first-page author footnotes. The footnote symbol precedes the comma following the name (unlike in text, where the symbol follows the punctuation).

ANDREW R. CONN†, LUÍS N. VINCENTE‡, AND CHANDU VISWESWARIAH§

- Two or more names may carry the same footnote symbol. One name may carry two footnote symbols.

H. CHENG†, V. ROKHLIN‡, AND N. YARVIN†

MARY H. HRIBAR†‡ AND RICHARD H. BYRD†

- Insert a space between initials: M. F. K. Fisher.

- There is a period after each initial in an abbreviated hyphenated name: Y.-N. Lee.

- Avoid breaking the byline in the middle of an author's name. If need be, it can be broken after the AND to keep a name together.

2.3 Dedication

- Dedications are optional.

- The dedication is set below the authors' names. It is set in 9-point italic type, centered; no period follows.

- The author's wording usually is appropriate.

- Wording for dedications in special issues may have been decided upon by the editor-in-chief (EIC) (*This paper is dedicated to John Dennis on the occasion of his* 60*th birthday*). Often special issues forego dedication lines in individual papers because the issue is dedicated to an individual and a separate dedication has been written for the issue. The EIC will decide whether to use dedication lines in individual papers.

2.4 Abstract

Keep in mind when editing that an abstract must be able to stand alone, independent of the paper; abstracts appear solo in SIAM Journals Online, Math Reviews, and many other databases. This is why abstracts cannot contain citations to the paper's references or equations or other soft-coded items.

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- All papers need an abstract. It follows the authors (or the dedication line).

- Abstracts are set in 8-point type. The first line is paragraph indented. The word *Abstract* is set in bold, followed by a period. The text is roman and runs in.

- Because of online formatting, abstracts must appear as plain as possible. They must consist of only one paragraph, so merge multiple paragraphs into one. Move displayed equations into the text of the abstract; confirm setup with author.

- The text and mathematics of the abstract are treated exactly as in the body of the paper. Ensure spelling, hyphenation, and other points of style are consistent with the paper.

- The use of first-person pronouns in the abstract is acceptable. Do not reword abstracts to remove the first-person, active voice.

- Reword citations to equations that appear in the body of the paper or replace them with the equations. Photocopy the equation for inclusion if it is too long to be written out clearly and attach it to the page. Confirm the change with the author.

- Replace reference citations by placing the following information within brackets at the callout point. For journal article references, insert the author's name, journal abbreviation (in italics), volume, year, and page numbers, but not article title. For book references, insert the author's name, title (in italics), publisher, location of publisher, and year.

Abstract. Chung and Ross [*SIAM J. Comput.*, 20 (1991), pp. 726–736] conjectured that the multirate three-stage Clos network $C(n, 2n - 1, r)$ is rearrangeable in the general discrete bandwidth case.

Abstract. In the present paper multilane models for vehicular traffic are considered. Numerical simulations are presented for all three levels of description in [A. Klar and R. Wegener, *SIAM J. Appl. Math.*, 59 (1999), pp. 1002–1011].

Abstract. We describe the bifurcation diagram of limit cycles that appear in the first realistic quadrant of the predator-prey model proposed by R. M. May [*Stability and Complexity in Model Ecosystems,* Princeton University Press, Princeton, NJ, 1974].

Abstract. Infection-age structure has been previously shown to cause qualitative changes in the case of a single disease dynamics (see [V. Andreasen, in *Mathematical Approaches to Problems in Resource Management and Epidemiology,* Springer-Verlag, Berlin, 1989, pp. 142–151]).

- Replace footnote callouts with the footnote text, in parentheses if appropriate. Confirm the change with the author.

- Spell out acronyms on first use. If the acronym does not appear again in the abstract, spell it out and delete the acronym itself. Acronyms defined in the abstract must be defined again, on first occurrence, in the text of the paper.

2.5 Key Words

- All papers need key words. Key words follow the abstract.

- Key words are set in 8-point type. The first line is paragraph indented. The words *Key words* are set in bold, followed by a period. The text is roman and runs in, with no ending period.

- Change *Keywords, Key Words, Key words and phrases* to *Key words* followed by a period.

- The first word of the list is lowercase, unless it is a proper name. Items are lowercase; capitalize proper names only.

- Any number of words or phrases may be included.

- Ensure that spelling, hyphenation, etc., agree with rest of paper.

- If key words are missing, try looking in EJPress (under Check Manuscript Status).

2.6 AMS Subject Classifications

- AMS subject classifications are optional for all journals. They follow the key words.

- The first line is paragraph indented. The words *AMS subject classifications* are set in bold, followed by a period. The text is roman and runs in, with no ending period.

- AMS subject classification are styled as follows:

  AMS subject classifications. 68Q25, 68R10, 68U05

  AMS subject classifications. Primary, 68Q25, 68R10; Secondary, 68U05

  AMS subject classifications. 68Q, 68R, 68U

  AMS subject classifications. 68, 69, 70

  AMS subject classification. 68Q25

  Note that "classification" is singular if there is only one classification.

- Don't include the descriptions of the classification numbers.

2.7 Other Subject Classifications

Treat other subject classifications (CR subject classifications) as AMS subject classifications.

2.8 DOI

- All papers need a DOI. The DOI follows the subject classifications.

- The DOI line is paragraph indented and set in 8-point type. *DOI* is set in bold, followed by a period. The number is roman and runs in, with no ending period.

- The DOI is constructed of 17 characters, as follows: the prefix (10.1137/) and then a number consisting of the last two digits of the year in which the paper was submitted, the manuscript number (prefaced by 0), and a "check sum," which is X or a number 0 through 9 assigned by EJPress.

- To retrieve the DOI number from EJPress,

  1. log into EJPress;
  2. click on "Advanced Manuscript Tasks";
  3. enter the manuscript number, including 0 and any R's as necessary—check the cover sheet;
  4. click on "Set/Modify Production Data";
  5. find the DOI number in the table of data on the article.

- The DOI is the digital object identifier. It is used for cataloging purposes and for linking to the electronic version of an article.

2.9 First-Page Footnotes

All papers need first-page footnotes—a title footnote and author footnotes. They are separated from the text by a 3-em rule (———). They are set in 8-point type.

2.9.1 Title Footnote

- The title footnote is paragraph indented and preceded by an asterisk.

- The form is

  *Received by the editors January 12, 1999; accepted for publication (in revised form) July 6, 1999; published electronically DATE.

  The first date is the date the paper was first received by the editors for review. The second date is the date of the editor's acceptance letter. The third date is filled in by Online Services when the paper is posted on the Web.

- "(in revised form)" is included only if the paper went through a revision cycle.

- SIMAX and SIADS title footnotes also include the name of the reviewing editor who accepted the paper. Their form is

  *Received by the editors June 8, 2009; accepted for publication (in revised form) by Y. Saad October 1, 2009; published electronically DATE.

  The reviewing editor's name appears exactly as in the journal masthead.

- SISC title footnotes also contain the name of their respective section. They are formatted as follows:

  The three sections are

  A Methods and Algorithms for Scientific Computing
  B Computational Methods in Science and Engineering
  C Software and High-Performance Computing

Previous Publication Information

- The title footnote may also contain previous publication information.

- If a preliminary version of an article has been published elsewhere (generally in conference proceedings from the ACM and IEEE), the author will have noted that the article has been substantially rewritten and will have included permission to republish from the previous publisher. Occasionally SIAM (Publisher) may have to request permission to republish; a specific credit line may be required. Retain the SIAM copyright notice, but include all information concerning previous publication in the title page footnote.

- Use SIAM reference style when including information about previously published versions. For proceedings use the article title (if different from the current title of the paper), title of the proceedings or conference, conference location, date, publisher or sponsoring organization (if not included in the proceedings title or if the abbreviation of the sponsoring organization's title was used and is not well known to most readers), and page numbers (optional). Delete extraneous material such as the month the conference was held.

appeared in *Distributed Algorithms: Proceedings of the 8th International Workshop,* Terschelling, The Netherlands, 1994, Lecture Notes in Comput. Sci. 857, G. Tel and P. Vitanyi, eds., Springer-Verlag, Berlin, 1994, pp. 194–208.

- If an entire article has been published elsewhere, permission from the previous publisher must be secured. Per our copyright transfer agreement, the author should have obtained such permission, but occasionally SIAM (Journals Publisher) must do so. A specific credit line and a fee may be necessary. Delete the SIAM copyright notice from the title page. This situation is rare.

Grant Support Information

- The title footnote in all journals may also contain grant information. Grant and support information includes the name of the granting agency (note that acronyms [NSF, DOE, ONR] are acceptable and do not need to be spelled out), the grant or contract number if supplied, and any other information supplied. "Grant" and "Contract" are lowercase; delete "No.," "Number," or "#" preceding the grant number.

    *Received by the editors January 12, 1999; accepted for publication (in revised form) July 6, 1999; published electronically DATE. This research was supported by NSF grant CCR-9357793.

    *Received by the editors January 12, 1999; accepted for publication (in revised form) July 6, 1999; published electronically DATE. This research was supported in part by a grant from the National Science Foundation.

    *Received by the editors January 12, 1999; accepted for publication (in revised form) July 6, 1999; published electronically DATE. This work was partially supported by Hughes Research Laboratories and by NSF grants CCR-9204868 and CCR-9504192.

- Grant and support information is included in the title footnote only if it applies to the entire paper or if there is only one author. See **Author Footnotes, Grant Support Information** for the setup for papers with multiple authors with separate grants or sources of support.

Copyright Information

- One of the authors of each paper must sign a copyright form.

- If the author signed section 2 (U.S. government employees) or section 3 (U.S. government contract or grant work) of the copyright agreement, add the following text to the title footnote, after grant support information, previous publication information, or Published electronically DATE, whichever is last. (This text is stored in p:\editoria\prdctn\usgovfn.doc.)

    U.S. government employees   This work was performed by an employee of the U.S. Government or under U.S. Government contract. The U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U.S. Government purposes. Copyright is owned by SIAM to the extent not limited by these rights.

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- The URL is composed as follows: http://www.siam.org/journals/[journal name]/[volume-issue]/[manuscript number].html

- It looks like this:

    http://www.siam.org/journals/siopt/24-4/36811.html

- Note that the journal name is lowercase and the manuscript number is the five digits following the zero.

- The volume and issue are added by Online Services when the paper is posted on the Web.

2.9.3 Author Footnotes

- The author footnotes follow the URL. Each is paragraph indented and preceded by a footnote symbol corresponding to the author's name in the byline. Usually one footnote appears for each author.

- An author footnote contains, in this order, the author's department, institution, city, state (use the postal abbreviation, i.e., MN, not Minn.), zip code, and e-mail address (if available). Acronyms such as INRIA are acceptable; there's no need to spell them out.

    † Department of Computer Sciences, The University of Texas at Austin, Austin, TX 78712 (diz@cs.utexas.edu).

- If an author has no institutional affiliation, include his or her street address.

- For authors outside the United States, include all information given, making sure that it includes the author's institution, country, and, for England and Canada, the six-character postal code. Use two-letter abbreviations for Canadian provinces and territories, such as BC for British Columbia. Stet the author's use of UK, United Kingdom, Great Britain, or England.

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Spell out PRC—People's Republic of China. (Note that the Republic of China [ROC] is not the same as the People's Republic of China.) Stet the author's placement of the postal code—before or after the city—as long as the country is last.

†School of Computer Science, McGill University, Montreal H3A 2K6, PQ, Canada (luc@cs.mcgill.ca).

†Institut für Statistik, Ökonometrie und Operations Research, Universitätsstrasse 15, Universität Graz, A-8010 Graz, Austria (hans.kellerer@kfunigraz.ac.at).

†Institute of Applied Mathematics, Chinese Academy of Sciences, Beijing 100080, People's Republic of China (xdhu@amath3.amt.ac.cn).

- Two or more addresses for an author may be needed. If an author updates his or her address, leave the affiliation and the address that the author originally provided (unless the author requests otherwise) and follow it with "Current address:". If an author is deceased, insert "The author is deceased. Former address:" before the author's affiliation.

†Institute of Applied Mathematics, Chinese Academy of Sciences, Beijing 100080, People's Republic of China. Current address: Department of Computer Science, The University of Vermont, Burlington, VT 05405 (ghlin@emba.uvm.edu).

- If all information is identical for two or more authors, use one footnote.

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†Department of Mathematics, Tsinghua University, Beijing 100084, China (hanwu@ sun.ihep.ac.cn).

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‡Fakultät für Mathematik, Otto-van-Guericke Universität Magdeburg, D-39016 Magdeburg, Germany (on.tau@zib-berlin.de). The research of this author was supported by a research fellowship of the Euler Institute for Discrete Mathematics and Its Applications and by START project Y43-MAT of the Austrian Ministry of Science.

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2.10   Slug Line and Copyright Line

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Vol. 70, No. 3, pp. 777–786

- The copyright line is located at the top right of the first page of an article. It looks like

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2.11 Running Heads

- The right running head is an abbreviated title. It need not match the one on the cover sheet, which may be provisional.

- The left running head is the authors' names, which should appear as in the byline.

- Running heads may not exceed 50 characters including spaces and punctuation. If the author names exceed the character limit, reduce first names to initials; if that isn't enough, replace "and" with a comma and use only one initial per name. If neither of these options works, delete all initials and the word "and." The final option is to use the last name of the first author followed immediately by "et al." Query the author for a shorter right running head if it exceeds the limit.

- Up to 55 characters may be used if absolutely essential, but not if it seems that the running head would run into a four-digit page number. Place a note on the cover sheet to alert Online Services.

- Running heads are set in 8-point full caps, which allows for the use of a lowercase "s" in terms such as PDEs.

- Avoid mathematical expressions when possible, but when variables are used, ensure that they are italic and in the proper case.

- The running head that appears on the preTEXed version of a paper may not match the running head listed on the cover sheet. Stet the running head in the preTEXed version if it reflects the title of the paper, and change it on the cover sheet.

- Make sure all spelling and hyphenation correspond to that in the title and authors' names.

- Running heads sometimes will be sacrificed by the compositor to accommodate large figures or tables.

- Acronyms may be used in running heads, but do not use abbreviated words.

2.12 Notation

An author may include a list of characters and their definitions. Set this in a Notation section.

- A Notation section is optional and follows the DOI.

- The head *Notation* is set in caps/small caps, flush left.

DOI. 10.1137/08072771X

NOTATION.

$n[m]$	Number of independent [dependent] variables
F	Given vector function
$F'(x)$	Jacobian of F
$x[y]$	Vector of independent [dependent] variables

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Introduction. In his seminal work, Kleinberg showed . . .

- The characters and their definitions appear side by side in two columns in 8-point type. If the author used an alternative, clear style, stet the author's style.

Chapter 3

Editing Text

Text is set in Computer Modern, 30.5 picas wide by 51 picas deep, including the running head.

A paper may contain sections and subsections; numbered or unnumbered theorems, remarks, definitions, etc.; equations, in text or displayed; footnotes; figures; and tables. Each of these items is described in its own section.

3.1   Basic Editing

Read the paper carefully and correct errors in grammar, spelling, and usage. Correct incomplete sentences, dangling participles, and disagreement in number, gender, or tense. Edit to improve wording and sense as needed. Papers by authors whose first language is not English need special attention. Different authors may write separate sections of the paper; edit the paper for consistency in voice throughout. Change British spellings to American.

Impose and maintain a consistent style for spelling, punctuation, and treatment of compounds (*first-order* or *first order*; *time step* or *timestep*); mathematical expressions (e.g., 1000 versus 1,000; 2-norm versus two-norm); reference citations ([1], [2], [3] or [1, 2, 3]); numbering (Theorem 1 or Theorem 1.1); and formatting. Note all stylistic decisions on the back of the manuscript cover sheet. (Note: Try to rewrite to avoid references to other pages within the journal issue.)

The Elements of Style by Strunk and White and *The Careful Writer* by Bernstein are good sources of grammatical information and guidance. *The Chicago Manual of Style* and *Words into Type* are good resources for style issues.

- Check the title, running heads, abstract, and section heads to make sure usage (spelling, hyphenation) is consistent with the text.

- On the back of the cover sheet, in addition to style notes, keep a list of all elements—section numbers; numbers of lemmas, theorems, remarks, etc.; equation numbers; figure and table numbers; and footnote numbers. Check the list before editing for consistency in numbering.

- Compare numbered or lettered lists; series of phrases, conditions, etc.; and other recurring elements and ensure that they are treated consistently.

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- Many authors do not punctuate series of equations even if their text punctuation is acceptable. Check that all needed punctuation is added. See **Editing Math**.

- Margin breaks of up to 1 pica are acceptable. In rare cases, such as complex tables or matrices, the margin can be broken by up to 2 picas.

- Figures and tables are placed close to their callouts, generally on either the same page or the following page. Figures and tables must not appear midparagraph if located in the middle of a page. See **Figures** and **Tables** for instructions for styling figures and tables.

- Close overly large space between paragraphs of text. There should be approximately 1.5 lines (base to base) of space above a paragraph that begins with a heading. There should also be approximately 1.5 lines (base to base) of space above and below, or between, displayed equations. There is no extra line spacing above or below math items (theorems, lemmas, etc.).

- Lines may spread because of accents or other symbols atop variables. This spread is unavoidable.

3.2   Type

3.2.1   Blackboard Bold

- Mark "fake" blackboard bold type to be set as true blackboard.

$$\text{Fake:} \quad \rm I\!R \qquad \text{True:} \quad \mathbb{R}$$

3.2.2   Bold

- Bold is used for section and subsection headings; for variables, as set by the author; and in algorithms, as set by the author.

- Bold is not used for emphasis. To emphasize a word, use lightface italic (roman in italic environments).

- List identifiers are not bold.

- Underline in green highlighter bold text that is to be set in lightface type. Mark the margin as well.

3.2.3   Italics

- Change slant type to italic.

  This is slant type.   *This is italic type.*

- The text of theorems, lemmas, and other math items is italic; see **Mathematical Items** for styling math items.

- Author-created functions may be italic; check for consistency. Functions may be italic when used as subscripts or superscripts within math mode. Functions on the list in Appendix A must be roman.

- Variables generally are italic (f) but may appear as bold roman ($\mathbf{f}$), bold italic ($\boldsymbol{f}$), roman (f), fraktur ($\mathfrak{f}$), calligraphic ($\mathcal{F}$), or blackboard bold ($\mathbb{F}$). Stet the author's usage (changing fake blackboard to true), but query the author (by e-mail before turning in the paper) about extensive use of roman variables.

  Roman and italic variables: $\mathrm{E}[d^{(j)}(w, R, x \odot Y, Y) - e^{(j)}(w, R, Y)] = \delta_0^{(j)}(w)$

  Bold and italic variables: $\sum_{j \in \{0,\ldots,k_n-1\}} c_j \geq k_n \mathbf{p}_n - k_n^{2/3} = m_n + k_n^{2/3}$.

  Bold, italic, and calligraphic variables:
  $$\mathbf{L_1}(\mathcal{D}, \mathcal{E}) = \sum_{x \in S} |\mathrm{Pr}[\mathcal{D}(x)] - \mathrm{Pr}[\mathcal{E}(x)]| / 2.$$

- Abbreviations and acronyms are italic within italic text.

- Punctuation and parentheses within italic text are italic when used as true punctuation, that is, not as part of math. Parentheses enclosing math that are part of the math are roman.

  The function graph of $F(\lambda) = F(I(\lambda))$ is piecewise linear and convex; we shall denote it by $G(\mathcal{P})$. (The function graph is convex for a maximization problem.)

- Stet the author's use of italics for the first use of a term or for occasional emphasis.

  Similarly, a *cycle dag* is a dag whose covering graph is a cycle, a *tree dag* is a dag whose covering graph is a tree, and a *unicyclic dag* is a dag whose covering graph contains a single cycle. A tree dag is *rooted* by selecting an arbitrary node to be its *root.*

3.2.4 Roman

- Numerals are always set in roman type, never in italics. This holds for numerals within italic text, mathematical expressions, figure legends, and references and for those used as identifiers within lists, e.g., (1), (i).

  Rarely, a table will contain a group of numerals set in italics to distinguish these from another group of numerals. Stet this arrangement.

- All letters used as identifiers within lists—(a), (i)—are roman.

- All letters used to identify parts of figures (Figure 2.1(a)) are roman.

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- Latin words or abbreviations that can be found in the dictionary—for example, a priori, et al.—are roman.

- The functions in Appendix A are roman in math and in all text. An author can use almost any term as a function. Author-created functions—those that don't appear in Appendix A—may be set in italics; ensure consistency.

  The functions in Appendix A may appear as italic in subscripts and superscripts, however.

- If you change roman text to italics (such as within a definition), mark any text already in italics for emphasis to be roman instead. Also, instruct the compositor to stet italics within the math.

> DEFINITION 2. *An m-way merge is a procedure that turns m^2 sorted submeshes into a sorted $n \times n$ mesh.*

- Underline in orange highlighter text that is to be set roman; mark the margin as well. If you need to mark a large block of text, write a note to the compositor in the margin instead of underlining each line with the highlighter.

3.2.5   Fonts for Computer Terms

Authors set computer terms, computer code, and names of software packages in several different fonts. Generally stet the author's usage, but ensure a term is presented consistently throughout a paper.

Some manufacturers have preferences that must be followed, however; see http://www.mathworks.com/brandguide/editorial/products.html, for example, for rules regarding MATLAB and other MathWorks® products. (For example, you must rewrite to avoid possessives such as "MATLAB's.")

The reduction **MULT** $\leq_{\mathrm{r\text{-}o}}$ **SQUARING** is given by mapping the n-bit inputs x, y (of **MULT**) to the $(3n + 2)$-bit input $z = x2^{2(n+1)} + y$ (of **SQUARING**), so that $z^2 = x^2 2^{4(n+1)} + xy2^{2(n+1)+1} + y^2$.

Higher-dimensional versions of many 3SUM-hard problems are rSUM-hard for larger values of r.

The `insert` operation adds a new element to the queue. The `decrease-key` operation assigns a smaller value to the key of an element already on the queue. The `extract-min` operation removes a minimum element from the queue and returns the element.

The second type of graph we used was the WIDE GRID type. These graphs have length limited to 16 layers, while the width can vary from 512 to $32,768$ vertices. C was the same as for LONG GRIDS.

An instance of LABELCOVER(c, s) given by $\Gamma = (U, V, E, \Sigma, \Pi)$ consists of a bipartite graph over node sets U, V, with the edges E between them.

3.3   Capitalization

- In text, words denoting parts of a list—step, case, e.g.—are lowercase, unless the list itself gives the items as Step 1, Case (a), etc.

It is convenient to split it into three regions.

> *Region* 1. $n, \lceil n/2 \rceil$.
>
> *Region* 2. $\lceil n/3 \rceil$.
>
> *Region* 3. $\lceil n/(3 \cdot 2) \rceil, \ldots, \lceil n/(3 \cdot 2^{lb-(i+2)}) \rceil, \ldots$.

In Region 1, b_{i+1} is either n or $\lceil n/2 \rceil$; that is, $i = lb-1$ or $i = lb-2$.

Because the list items are given as "Region x," the reference to Region 1 is capitalized. However, references to list item identifiers that are not "named" are not capitalized:

It is convenient to split it into three regions.

> 1. $n, \lceil n/2 \rceil$.
>
> 2. $\lceil n/3 \rceil$.
>
> 3. $\lceil n/(3 \cdot 2) \rceil, \ldots, \lceil n/(3 \cdot 2^{lb-(i+2)}) \rceil, \ldots$.

In region 1, b_{i+1} is either n or $\lceil n/2 \rceil$; that is, $i = lb-1$ or $i = lb-2$.

- Names of theorems, lemmas, concepts, etc., are lowercase (except for proper nouns): the fast Fourier transform theorem, for example. Numbered theorems, lemmas, etc., are capitalized: Theorem 2.2, Lemma 3.1.

- Stet capitalization of the first word following a colon if what follows is a complete sentence.

- Capitalize the first word of a list item only if the item is a complete sentence.

Note the following:

> (1) The interval e_p is contained in some cell of $D(Q)$.
>
> (2) The endpoints of e_p lie on P_1 and P_2.
>
> (3) The vertical span of e_p is $\bar{\mu}/(6\delta + 1)$.

However,

> The connected graph G is built by
>
> (1) committing all uncommitted edges, as described above;
>
> (2) joining the remaining open entry vertices with some number, Δ, of extra vertices so as to make G have n vertices and be d-regular; and
>
> (3) designating one of these extra vertices as t.

3.4 Wording

- Stet *shall, upon, since.*

- Stet **future tense** unless it is grammatically incorrect.

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- Stet **first person**, including in the abstract. Stet **plural personal pro-nouns** even when there is only one author. The use of **one** also is acceptable.

- Stet reference numbers, variables, equation numbers, and mathematical expressions as the **first word in a sentence**.

- Delete **the word** *equation* mid sentence when used before the equation number, but don't delete terms describing the equation, such as "assumption (2.6)," "problem (14)," "inequality (3.3)." Stet "equation" at the beginning of a sentence.

- Stet **the word** *equation* when part of such expressions as "the density equation (3.1)." Also stet *equation* for clarity.

> Under the assumption in (1.2), equation (1.1) has monotone traveling wave assumptions.

- Stet the use of either **resp.** or **respectively** if usage is consistent within the paper. Insert a comma before or after respectively, or both, depending on the construction (see the section on commas below). Use of *respectively* in text and *resp.* in parentheses within a paper is an acceptable construction.

- An implied **respectively** is acceptable:

> Let K be a triangle (tetrahedron) and S be any of its edges (faces).

- Stet **contractions** (don't, can't).

- Stet the author's use of **i.e., e.g., that is, for example, vice versa, cf.,** and **etc.** These appear in roman in roman text and in italic in italic text. *i.e., e.g., that is, for example,* and *etc.* are set off with commas.

- Always use **section** and **subsection** instead of §. Note that the s is lowercase.

- In text, spell out *Figure* for **figure callouts**: See Figure 2.1.

- Stet the author's **use of** *above* **and** *below* when what is referred to doesn't physically fall above or below on the page.

- Change the author's use of **the sequel** to *what follows* or similar wording. Be sure, however, that the author is not referring to Part II of a paper in a series, for example.

- Use **for all,** not $\forall$, in general text.

> For all sets S_i in P, partition S_i into maximal cliques containing v, S_i'.

> A scheme is *independent* if for all its states local satisfaction implies global satisfaction.

- Use a comma in **if/then constructions**.

  If you go down to Hampton, then you can forget about us.

  If $x < 0$, then $x = y$.

  Some authors prefer not to use commas in this situation, so if the comma is not present throughout the paper, stet the author's style.

- Stet the author's use of ***that*** and ***which***. These may be changed if necessary if you are sure you understand the author's meaning and you are sure that meaning will not be changed.

  The Elements of Style concisely explains *that* versus *which*.

- Set up proper parallelization.

  Incorrect: The proof follows easily from Proposition 3.4, Theorems 3.5 and 2.4.
  Correct: The proof follows easily from Proposition 3.4 and Theorems 3.5 and 2.4.
  Incorrect: This type of system is practical, easily implemented, and can be adapted to different problems.
  Correct: This type of system is practical and easily implemented and can be adapted to different problems.
  Incorrect: The impedance Z' depends both on the driving current $\mathbf{I}$ and the actual boundary conditions $\boldsymbol{\psi}_R$ and $\boldsymbol{\psi}_I$.
  Correct: The impedance Z' depends on both the driving current $\mathbf{I}$ and the actual boundary conditions $\boldsymbol{\psi}_R$ and $\boldsymbol{\psi}_I$.
  Incorrect: As a result, in this case the first eigenvalue is genuinely nonlinear and therefore either will admit shock waves or rarefactions.
  Correct: As a result, in this case the first eigenvalue is genuinely nonlinear and therefore will admit either shock waves or rarefactions.

- The computer language MATLAB is spelled in all caps.

3.5   Acronyms

- Spell out acronyms the first time they are used in the text, followed by the acronym in parentheses.

- Acronyms on the list in Appendix B need not be spelled out. Stet if the author did so.

- An acronym spelled out in the abstract must be spelled out again in the body of the text.

- Use an acronym consistently throughout the paper once it has been introduced.

- Key words may appear as acronyms if the acronym is used throoughout the article.

- Plural acronyms are formed with a lowercase *s*, no apostrophe.

- Mark the *s* in plural acronyms in titles and running heads to be lowercase.

- 3*D,* 3*-D,* 3*d,* 3*-d* (for three-dimensional), e.g., are acronyms and should be spelled out on first use.

3.6 Punctuation

Mark the paper to conform to SIAM conventions, as follows. Maintain the author's style if it is consistent and does not violate specific SIAM style rules. Mathematical expressions, including displayed equations, are treated as phrases or sentences and are punctuated accordingly.

3.6.1 Comma

Don't overuse the comma. An open style, using commas only when necessary, is preferred. Be careful not to impose your personal comma style on the author, however. You should retain the author's use of commas whenever possible.

If a comma is not incorrect as placed, leave it alone. For example, short or midsentence phrases such as *thus, therefore, hence* may be followed by a comma or not. If commas are used, or not used, consistently in this case throughout the paper, leave them alone. Your goal is to make the paper consistent, not to take out or add arbitrary commas.

Consult *The Chicago Manual of Style* for comma usage and guidelines.

When to add or stet a comma

- Use the serial comma before the *and* or *or* in lists of three or more items. If commas are used within the items themselves, separate the items with semicolons.

- Use commas to set off parenthetical material.

  Discretion, they say, is the better part of valor.

  In this case, $x^i > 2$, $i = 1, \ldots, N$, and k denotes a constant.

  In the latter example, $i = 1, \ldots, N$ is a condition of $x^i > 2$; conditions are treated as parentheticals. See **Editing Math**.

- Set off *respectively* with commas.

  The first- and third-order methods are discussed in sections 2 and 4, respectively.

  Using $m = 1$ (resp., $m = .001$) yields 20 (resp., 42) points per subdomain.

  $T = 1$, respectively, $1 + n$, solved problems 2 and 4.

- Use a comma before *where* following an equation; it usually introduces nonrestrictive information.

- Set off *however* at the beginning of or within a sentence.

    However, by an argument similar to the one above, m's behavior is essentially the same.

    Such a regular graph exists by Proposition 3.1, however, since dn, $d(n - \Delta)$.

- Use commas after a long introductory clause.

    Since the Jacobian of the system is the zero matrix at the origin, the multiplicity must be at least 3 in order for it to be an isolated solution.

- Use a comma to avoid confusion.

    It is important to note the different properties of SCLP solutions constructed from solutions to $AP(P)$, and $AP(P)$ solutions constructed from solutions to SCLP.

    In general, equilibrium models are reduced to finding consistent prices.

    ...where μ and ν are positive constants which depend only on m and n, and
    $$\sigma(\mathcal{C}) := \mathcal{C}\{1 + \ln(1 + \mathcal{C})\}^{-1}.$$
    In the last example, the displayed equation is part of the *where* list; without the comma after *m and n* the equation could be misread as relating to *depend only on*.

- Use a comma, not a colon, in the following situations:

    The question we now ask is, Are strict and realistic bounds known for the remainder of the terms?

    Devo asked the musical question, "Are we not men?"

- Set author's preference if commas are not used in "if...then" constructions throughout the paper.

- See **Editing Math** for the use of commas in math.

When to delete a comma

- Delete a comma between the parts of a compound predicate (two or more verbs that have the same subject).

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Correct: We will also take advantage of the special structures of these problems and obtain improved computational complexity results whenever possible.

Incorrect: We present our study in several steps, and consider f strongly convex and differentiable.

- Delete a comma before a prepositional phrase. For example, delete commas before *if, for,* and *with* in the final clause of a sentence or equation.

- Delete a comma before $\forall$ and *for all*.

- Delete the commas in *if, and only if, .*

- See **Editing Math** for the use of commas in math.

3.6.2   Semicolon

- Use a semicolon to separate two independent, related clauses that aren't linked by a conjunction.

  Correct: These must be removed because otherwise the random walk becomes biased toward visiting vertices that are connected by many edges; our analysis requires that the random walk be unbiased.

  Correct: This assumption is required for the approximation results in Sobolev spaces; see, i.e., [5].

  Correct: Let us restrict ourselves to $m = 2$; then we can provide a proof for Theorem 4.2.

- A semicolon is used to separate independent clauses joined with *thus*, *hence*, *therefore*, *then*, *however*, and *moreover*.

- Use a semicolon between items in complex or lengthy lists, e.g., lists whose items contain commas within them.

  Correct: In the row-major indexing, $P_{i,j}$ has index $i \cdot n + j$; in the column-major indexing, it has index $i + j \cdot n$; and in the reversed row-major indexing, it has index $i \cdot n + (n - j)$.

  Correct: Furthermore, u will necessarily be even, since each entry vertex starts with $d - d'$ missing half-edges; since $d - d'$ is a multiple of q, hence even; and since each committed edge replaces a pair of missing half-edges.

- Semicolons and commas are not interchangeable.

  Incorrect: Clustering is used in various fields of statistical analysis; pattern recognition; learning theory; computer graphics; and combinatorial chemistry.

3.6.3 Colon

- A colon introduces a series or list. Use a colon only after a complete sentence, particularly if the sentence contains the words *the following* or *as follows.*

  We plan to visit the following cities: Rome, Venice, and Florence.

  The directions read as follows: stay straight for 400 yards, then bear left at the fork.

  This paper attempts to do the following:

  (1) review some of the known methods for mesh selection,

  (2) show their connections and propose some new variants,

  (3) introduce a new class of robust mesh-selection methods.

  However, if the list or series comes after an expression such as *namely, for instance, for example*, or *that is*, a colon is used only if the series consists of grammatically complete clauses.

  For instance: The author prepared his paper quickly; the review was accelerated; publication was expected.

  She is appearing in two plays, namely, *A Doll's House* and *Mother Courage.*

- A colon introduces a part of a sentence or an equation that exemplifies, restates, or explains the preceding part. Generally, the word following the colon begins with a lowercase letter unless it introduces a quotation or an element that is more than one sentence; however, stet the author's usage.

  In computational complexity theory, graph traversal is a fundamental problem for an additional reason: understanding the complexity of directed versus undirected graph traversal seems to be the key to understanding the relationships among deterministic, probabilistic, and nondeterministic space-bounded algorithms.

  Hemmerling and others have considered similar models; see Hemmerling's monograph for an extensive bibliography emphasizing results for "labyrinths": graphs embedded in two- or three-dimensional Euclidean space.

  The problem we will be considering is "undirected st-connectivity": Given an undirected graph G and two distinguished vertices s and t, determine if there is a path from s to t. If so, consider the set of all n-vertex, edge-labeled, undirected graphs $G = (V, E)$ with maximum degree d.

- Authors often use colons to introduce displayed equations and lists.

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Correct: The result is given in the following equation:

$$\log(n+1) - 3n = x + 1.$$

Correct: As a specific example, we take the logarithmic-quadratic function to inherit the following properties:

(a) z is a strictly convex differentiable function,

(b) $y = r$,

(c) $p > q$ otherwise.

Correct: We denote the feasible region for problem (1.1) by Ω:

$$\Omega = \{x \in \mathbf{R}^n | l \le x \le u\}.$$

Incorrect: The results can be written as:

$$Ca \ge [0].$$

Incorrect: The volume of a tetrahedron is given by:

$$1/3 \times (\text{area of base}) \times \text{height}.$$

Incorrect: We can also state that:

$$F(i) = I.$$

Note that no punctuation is used before the displayed equations in any of the three Incorrect examples given.

- Do not insert a colon before the direct object of the verb or before a predicate nominative. (The Incorrect equation examples given above illustrate this.)

Incorrect: Members of the department include: the undergraduates, graduate students, and the professors.

- Use periods, not colons, to introduce math items such as theorems and lemmas.

Correct: Our results are summarized in the following theorem.
        THEOREM 2.1. *Let X be a set* ....

Incorrect: Our results are summarized in:
        THEOREM 2.1. *Let X be a set* ....

Incorrect: Our results are summarized in the following theorem:
        THEOREM 2.1. *Let X be a set* ....

- Use a capital letter after a colon in titles of sections.

The Smith theorem: An overview.

The rules about complete sentences preceding or following a colon do not apply in these situations. (See *Chicago* discussion on sentence-style capitalization.)

3.6.4 Quotes

- Use double quotes around direct quotations and to set off original or unusual words. Do not use quotes around words or phrases that follow the expression *so-called*.

    A maximum partition matching can be constructed from a simpler "prematching" on the elements in U. If the number of subsets in the collection $\mathcal{S}$ is small, we develop a greedy algorithm that uses a "chain justification" technique.

- Single quotes are used only within double quotes:

    "His exact words were, 'I'll be there at noon,'" said Elisa.

- Commas and periods fall inside quotation marks, whereas colons and semicolons fall outside quotes. Question marks and exclamation points go inside quotes only when part of the quoted material.

    "Ladies and gentlemen, this is the first time I've ever been on before the acrobats," Hope said.

    To this day, he will frequently exclaim genially, "I'nnat something?"

    Would you believe her if she said, "I didn't see a thing"?

3.6.5 Period

- Figure captions and table titles end with a period.

- There is a period after each initial in an abbreviated hyphenated name: Y.-N. Lee.

3.6.6 Hyphen

Hyphens are used in compound words, most commonly compound adjectives. Some compound words, such as long-term, always contain hyphens and appear that way in the dictionary. **Stet hyphens that are used to clarify meaning** (*non-sensing algorithm* versus *nonsensing algorithm*; *non-diagonally-dominant* versus *nondiagonally dominant*).

For mathematical terms, **follow the author's style for compound words**, using hyphens and spaces or closing up words consistently.

second-order   *or*   second order

ill-posed   *or*   ill posed

well-conditioned   *or*   well conditioned

Use a hyphen, not an en dash, in word pairs.

even-odd system

an apples-oranges kind of choice

a zero-nonzero pattern of solutions

Here's an interesting situation:

The idea is to construct sub- (super-) solutions using the maximum principle.

Stet this construction, although throughout the paper these words are not hyphenated.

See *Chicago* for more in-depth hyphenation rules. Consult *Webster's* for treatment of specific words.

Hyphenate

- words formed with the prefixes *all-*, *self-* (including *non-self-adjoint*) (see *The Chicago Manual of Style* for exceptions)

- adjectives formed with the prefix *quasi-* (*quasi* nouns are set open)

  a quasi-gradient method

  a method that is quasi-gradient

but

  a quasi method

- words formed with the suffix -type

  a Newton-type method, a Cauchy–Schwarz-type equation

- words formed with prefixes before a proper noun

  non-Hermitian

Hyphenate when preceding a noun

- adjective plus past participle

  nimble-minded mathematician, well-known study

- noun plus present participle

  decision-making methods

- adjectival compounds

  lower-level toxin

- compounds of degree

  very-low-degree polynomial

Don't hyphenate

- words formed with the prefixes *ante-, anti-, bi-, counter-, de-, equi-, extra-, infra-, inter-, intra-, macro-, micro-, mid-, mini-, multi-, non-, over-, pre-, post-, pro-, pseudo-, re-, sub-, super, supra-, trans-, tri-, ultra-, un-, under-*

- *semi-* (except when joined to a word beginning with *i*),

- words formed with the suffixes *-fold, -hood, -less, -wise*

- *quasi* nouns

- words commonly read together as a unit

  ice cream cone

- after adverbs ending in *-ly* even when used in a compound modifier

  highly specialized field

- *ill* and *well* compounds that are themselves modified

  very ill conditioned matrix

- *th* expressions: xth not x-th

3.6.7   En Dash

- The en dash (–) is most commonly used to express a range of numbers.

  equations (2.2)–(2.6)

  pp. 345–348

  Don't change an en dash to the words *to* or *through*. Change a hyphen in a range to an en dash.

- Use an en dash between two proper names joined in an adjectival construction.

  Smith–Jones formula

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- Use an en dash to form a compound modifier if one of the elements is hyphenated or consists of more than one word.

    mathematician–physicist-directed planning

    post–Civil War period

- Use a hyphen, not an en dash, in a word pair.

    even-odd system

    an apples-oranges kind of choice

    a zero-nonzero pattern of solutions

3.6.8   Em Dash

- Use an em dash (—) to set off material for emphasis. (For less emphasis use parentheses.)

    The probability that we have found such a configuration is $P_{0.5}(1000) \approx 1 - e^{-5} = 0.99326$—a virtual certainty.

    This triumvirate—baseball, hot dogs, apple pie—defined America for much of the 20th century.

3.6.9   Apostrophe

- Variables are made plural by adding an apostrophe and the letter s.

    The splay state of a globally coupled IF network is stable for small α's (slow synapses) but undergoes a Hopf bifurcation at some critical α_c's.

- However, plurals of acronyms do not contain apostrophes; for example, write PDEs, not PDE's.

3.7   Spelling

Determining and enforcing spelling and hyphenation conventions can be tricky. This section will help alleviate some of the randomness with which these decisions can be made. All spelling and hyphenation conventions given are the preferred SIAM style. Note that SIAM employs American spelling only.

Most questions concerning spelling and hyphenation can be answered by consulting our major reference sources: *Webster's Ninth* (or *Tenth*) *Collegiate Dictionary, The Chicago Manual of Style, Mathematics into Type, The Harper Collins Dictionary of Mathematics,* and *James and James's Mathematics Dictionary 5/e.*

The following list presents words that are often misspelled. (Those words marked with an asterisk are hyphenated when they *precede* the nouns they modify.)

above-mentioned
abscissa
acknowledgment
adduce
admissible
analogue (n)
analog (adj)
analyticity
ansatz
azimuth
bijection
canceled
canonicity
cardioid
contragradient
contragredient
cross section (noun)
dependences
dependencies
descendant (noun)
descendent (adjective)
deviatoric
dihedral
discretized
eikonal
epitrochoid
extendible
hysteresis
infimum
kernel
labeled
*left-hand
martingale
media (plural of medium)
metastable
minuscule
modeled
normable
occurrence
occurring
oscillatory
osculatory
paradigm
parallelepiped
parameterize (parametrize if consistent)
parsable, parsing
perturbation
poloid, poloidal
precede, preceding
proceed, proceeding
quasi (noun compounds open, adj. compounds hyphenated)

*right-hand
separatrices
separatrix
solenoidal
stoichiometry
stratagem
subtracted
substracted
subsumed
supremum
Tokamak
toroidal
traveled
unselfconscious
*well-known (adj. before noun, but not if it's modified: very well known)
well-posedness, wellposedness (stet author's use)
zeros
zeroth

3.7.1 Commonly Confused Words

Be careful not to confuse the words in the following list. Check the dictionary or query the author to resolve inconsistencies.

- affect vs. effect

- analogue (noun) vs. analog (adjective)

- contragradient vs. contragredient

- dependences (dependances) vs. dependencies

- descendant vs. descendent (*Webster's* lists both of these as equal variants for spelling both the adjective and noun forms of this word. However, if both parts of speech are used in the same paper, it may be a good idea to distinguish between the parts of speech by choosing a different spelling for each.)

- oscillatory vs. osculatory

- precede, preceding vs. proceed, proceeding

- substracted vs. subtracted

3.8 Quotations

Direct quotations of five or more lines should be block indented. Ask the comp to use the "quote" TeX command, which indents the quotation about 3 picas on either side.

Chapter 4

Footnotes

- A footnote is located at the bottom of the page on which its callout appears, separated from the body of the paper by a 3-em line (———).[1]

- A text footnote begins with a paragraph indent and a superscript arabic number and ends with a period.

- Text footnotes are numbered with consecutive arabic numbers. Renumber footnotes if the author used asterisks, daggers, etc., or numbered footnotes by section.

- Footnote citations follow internal and end punctuation.

  The previously cited thesis,[2] elaborated upon by Vaughan and Young, presents an extended discussion of this idea.[3]

- If the author cited a footnote within a mathematical expression, move the citation to the text if feasible, to avoid confusion with superscripts. If a footnote symbol can be mistaken for a mathematically pertinent superscript, alleviate the ambiguity in one of the following ways: (a) Rewrite the sentence so that the footnote marker is presented in an unambiguous position. (b) Insert an uncommon first-page footnote symbol, such as a paragraph symbol.

- Equations and other mathematical material in footnotes are allowed. Set these as compactly as possible; avoid displays or lists within a footnote.

  Incorrect:

  [2]To see the equivalence, assume that $\mu[r(x) > l^k] < c/l$. Let $\varepsilon = \frac{1}{2k}$. Then, for all $l \in \mathbb{R}^+$,
  $$\mu[r^\varepsilon(x) > l] < c/l^2,$$
  and so
  $$\sum_x r^\varepsilon \mu(x) \leq \sum_{n=1}^{\infty} n\mu[n-1 < r^\varepsilon(x) \leq n] = \sum_{n=0}^{\infty} \mu[r^\varepsilon(x) > n] < \infty.$$

---

[1]Hi there. I'm a footnote.

Correct:

> [2]To see the equivalence, assume that $\mu[r(x) > l^k] < c/l$. Let $\varepsilon = \frac{1}{2k}$. Then, for all $l \in \mathbb{R}^+$, $\mu[r^\varepsilon(x) > l] < c/l^2$, and so $\sum_x r^\varepsilon \mu(x) \leq \sum_{n=1}^\infty n\mu[n-1 < r^\varepsilon(x) \leq n] = \sum_{n=0}^\infty \mu[r^\varepsilon(x) > n] < \infty$.

- If a footnote is actually a reference, move it to the References section, format it appropriately, delete the footnote citation from the text, and add a reference citation.

- Don't allow footnotes to break across pages.

- During editing and proofreading, highlight in yellow footnote citations in the text and the corresponding footnote marker; this is done to make it easy to note whether the footnote falls on the same page as its in-text mention.

- Reference citations are allowed in footnotes.

Chapter 5

Section and Subsection Heads

Section and subsection heads are optional but they almost always appear.

- A section or subsection head is paragraph indented and begins with the number (if any) followed by a period. The title begins with a capital letter, but no other letters are capitalized unless they are proper names or mathematical items (e.g., Theorem 3.1) or the heading contains more than one sentence or free-standing phrase. The head is followed by a period. The text runs in (unless the text is a subsection head, theorem, remark, or other item that requires a paragraph beginning). A heading is preceded by a half line of leading.

  3. Results: Tiger-paw family.

  5. Stress intensity factors of Theorem 7.

  2.1. Basic equations and Fredholm's equations.

- All material in section and subsection headings is boldface, including mathematical material. Material (variables, e.g.) that appears lightface italic in the body of the paper must be set bold italic, including superscripts and subscripts.

  Correct: **3.1. Evaluation of $\boldsymbol{\gamma_{\mathrm{s}}^{j}}$ and $\boldsymbol{M_j^{*}}$.**

  Incorrect: **3.1. Evaluation of γ_{s}^{j} and M_j^{*}.**

- Section and subsection heads may contain information following a colon, parenthetical information, and reference citations.

  2. Computing dominated sets: Graphs and patterns.

  3.1. Hidden bits (obscure kibble).

  1.1. Applications [1].

Note that the word following a colon is capitalized.

5.1   Numbering

The preferred form for numbering (and, fortunately, the form used by most authors) uses Arabic numerals 1, 2, 3, etc.; subsections are 3.1, 3.2, etc.; and the introduction is numbered 1. If this is the form used, check the manuscript for gaps and duplications in numbering.

Preferred section numbering: **1.   The Boolean hypercube.**   In this section, the . . .

Preferred subsection numbering: **1.1. Applications.**

5.1.1   Variations

The following are common variations on this form and the appropriate changes to make, if any.

- **Roman numerals or letters are used.** Change them to the corresponding Arabic numeral.

- **The introduction is unnumbered or is numbered 0.** Delete the 0 from the head, but otherwise make no changes. Do not renumber other sections or equations in order to renumber the introduction as 1. Allow equation numbers (0.1) and other numbering to stand.

- **The Acknowledgments section is numbered.** Delete the number.

- **The References section is numbered.** Delete the number.

- **There is a second level of subsections.** Use your judgment. The author may have numbered them (3.2.1, etc.), identified them by letter, or underlined them. If the paper is long and each heading contains two or more paragraphs, or if equations are numbered with reference to the subsection level, treat these as subsection heads, maintaining the author's numbering system (including identification by letter rather than by number).

- **There are parts or other supersections.** A very long manuscript may be divided into parts identified with roman numerals, with numbered sections within them. Allow this arrangement to stand.

- **Paragraphs are numbered in the same sequence as theorems, etc.** This situation is rare and is not allowed to stand if a solution can be found. Give it careful thought before making changes. Changes should be as few as possible, to minimize the number of text citations that must be checked. Use one of the following approaches:

  1. Delete the paragraph numbers and renumber theorems, etc., as necessary. This is feasible if each section is fairly short and if the author does not cite the paragraphs by number.

2. Impose item labels (see **Lists**) on the numbered paragraphs. This is feasible if each paragraph readily can be identified as a remark, hypothesis, or other such item. Check the text carefully to determine how the author refers to them.

3. A mixture of both of the above.

5.1.2   Unnumbered Section Heads

Authors may use unnumbered section heads. These heads may be bold or italic. In general, unnumbered heads should be left as the author set them up (stet extra space before unnumbered heads). Do mark them with a paragraph indent. Delete the underscore under heads—change these heads to bold or italic (or bold italic if necessary) depending on the heading style used in the rest of the paper.

5.2   Text Citation

- Two or more sections are cited in text as "see sections 2.3 and 4.2" and "see sections 2.3, 4.2, and 4.3," not as "see section 2.3 and section 2.4."

- Every section citation must include the word *section*. If the author cites numbers without identification, determine if a section or subsection is being cited and insert the identifier. When in doubt, query the author.

- If text citations must be changed, check after you finish editing to make sure all corrections have been made.

- Spell out *section*—never use §.

Chapter 6

Mathematical Items

Mathematical items are theorems, lemmas, corollaries, examples, etc.

6.1 Type Style and Arrangement

Every mathematical item begins with a paragraph indent. There is no extra leading above an item. Type style for headings and text is summarized in the following table. The general principle is that statements and conclusions to be proved are set in italic text.

Item	Heading	Text
THEOREM	cap/sm caps	*italic*
LEMMA	cap/sm caps	*italic*
COROLLARY	cap/sm caps	*italic*
DEFINITION	cap/sm caps	*italic*
PROPOSITION	cap/sm caps	*italic*
Fact[1]	cap/sm caps or italic	italic or roman, respectively
Claim[1]	cap/sm caps or italic	italic or roman, respectively
Conclusion[1]	cap/sm caps or italic	italic or roman, respectively
Result[1]	cap/sm caps or italic	italic or roman, respectively
Consequence[1]	cap/sm caps or italic	italic or roman, respectively
Problem[1]	cap/sm caps or italic	italic or roman, respectively
Remark[1]	italic	roman
Example[1]	italic	roman
Hypothesis	italic	roman
Assumption	italic	roman
Proof	italic	roman
Note	italic	roman
Case	italic	roman
Step	italic	roman
Observation	italic	roman
ALGORITHM	cap/sm caps	italic, roman, or bold as needed

[1]Judgment needed. If the author appears to treat these as theorems, e.g., by providing proofs or citing locations of proofs, set them up like theorems. Also, if an author treated these consistently, i.e., heading in caps/small caps and text in italic, then stet. Mark any decisions about nonstandard formatting on the back of the cover sheet.

6.2 Numbering

- Authors use a wide variety of numbering systems:

  (1) single numbering—Theorem 1, Lemma 1

  (2) double numbering by section—Theorem 2.1, Lemma 2.1

  (3) sequential numbering of all items—Lemma 1, Theorem 2, Definition 3

  (4) sequential numbering of some items (like items) but not all—Theorem 1, Lemma 2, Definition 3, Remark 1, Theorem 4, Remark 2

- Mathematical items may not be numbered jointly with subsections.

- Single numbering that begins again with "1" in every section may create ambiguous citations. This problem generally can be resolved easily by numbering items according to the section in which they occur—Theorem 1 in section 3 becomes Theorem 3.1.

- LaTeX will number and format theorem-type environments—theorems, lemmas, corollaries, definitions, and propositions—if the theorem macro is used. Most authors use the macro in their papers.

6.3 Punctuation and Capitalization

- An item heading begins with a capital letter. The heading is followed by its number (roman, not italic). No parentheses are used around numbers. The heading and number are followed by a period, followed by the text.

  THEOREM 2.1. *Assume that $x < 0$.*

  Remark 3. Notice that $x < 0$.

- Parenthetical information immediately following the heading is set in regular roman font, lowercase except for proper names and references to other mathematical items.

  DEFINITION 1.1 (a PTW solution). *A nontrivial solution depends only on the single variable $z = x - \gamma$.*

- If a reference citation is given place it in parentheses and add appropriate text—"see" or the names of the reference authors—to avoid brackets nested within parentheses.

  Correct: PROPOSITION 2.14 (see [5, Proposition 4.6]). *Assume it is known that the instance is primal.*

  Correct: LEMMA 4.2 (Han et al. [14]). *Assume that* (3.10) *holds.*

  Incorrect: THEOREM 2.1 ([15]). *If condition* (a) *holds, then* (b) *does not.*

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6.4   Text Citation

- Mathematical items may be cited directly or indirectly.

  Refer to Theorem 3.2.

  See the theorem below.

  Our main theorem (Theorem 2.1) puts this forth.

- No abbreviations are used in citing mathematical items within a paper.

  Incorrect: The results are detailed in Ex. 4.

  Incorrect: We go into further detail later (see Thm 3.2).

- LaTeX will number and format theorem-type environments—theorems, lemmas, corollaries, definitions, and propositions—if the theorem macro is used. Using the LaTeX macros allows citations to math items to be *soft-coded* using a citation macro; thus if the numbering of the items is changed in editing, the citations will automatically be adjusted. If the author *hard-coded* the file—cited math items directly using their numbers—make sure the citations are correct if the numbering of the items is changed in editing.

6.5   Proofs

- A proof heading is always italic, paragraph indented. The text of the proof is roman.

  Proof of Theorem 4.   The proof follows by means of the same argument.

  Proof. It can be shown that $x \leq 0$.

- A proof heading must be followed by a complete sentence.

  Correct: *Proof.* The proof is in the pudding.

  Incorrect: *Proof.* Evident.

- Change

  Proof. It follows from [5].

  to

  Proof. The proof follows from [5].

6.5.1 End-of-Proof Boxes

- End-of-proof boxes are open boxes of a specific size and shape. Replace any that do not conform to the standard.

  Correct: ☐

  Incorrect: ■, ▌, ⋄, ◇

- Authors may or may not use end-of-proof boxes. If the author uses them inconsistently, query for the correct placement of those that are missing.

  AQ: Proof ends here? Placement of box correct?

- Stet boxes if they occur after other math elements, such as theorems, lemmas, or remarks. We assume that the author has a reason for doing this, e.g., the theorem is self-proving. However, if the author uses an end-of-proof box after a theorem and then follows the theorem with a proof, delete the proof box after the theorem. If the author has used one of the variant boxes above, change them to the standard style.

- End-of-proof boxes are separated from the last word of a sentence or character in a displayed equation by a 2-em space. This space may be reduced slightly if necessary to avoid running a box onto a new line.

- Move text down to fix a widowed end-of-proof box. End-of-proof boxes cannot be moved up a line to avoid a widow. Edit the text as a last resort.

  Before:

  Since the decomposition is strongly connected this means that $\check{q}$ is constant on the whole domain ∅. Recalling that it has 0 average gives the proof. ☐

  After:

  Since the decomposition is strongly connected this means that $\check{q}$ is constant on the whole domain ∅. Recalling that it has 0 average, we obtain the proof. ☐

- Replace *QED* with an end-of-proof box.

Chapter 7

Algorithms

An algorithm may be written in regular, grammatical text. However, more often it is presented as a list, often in computer code. See **Algorithm Examples.**

7.1 Numbering

Algorithms may be numbered with theorems, equations, or figures or identified separately.

7.2 Type Style and Arrangement

- Algorithms are set with no extra space above or below. If an author added extra space, close it.

- The heading *Algorithm* and title (if any) are caps/small caps, paragraph indented. The main text, if regular, grammatical text, is roman.

- Stet the author's use of italic and bold. Words such as *do, for, od, begin,* and *end* may appear in the algorithm as roman, italic, or bold, underlined or not.

- Stet the author's setup of entries. Generally, stet indents and alignment.

- A pair "begin ... end," "do ... , od," etc., can often be treated like a pair of parentheses—there should be as many "end" entries as there are "begin" entries. If indentation is used, align matching pairs. If there are more or fewer "end" entries than "begin" entries, query the author.

- Stet boxes around algorithms.

- Algorithms may be called "procedures." Format these as algorithms.

- Algorithms identified as figures should be stetted, with citations handled like those for figures.

- Algorithms may be set in 8-point type if this would improve the overall appearance of the paper.

- Make sure that an algorithm broken across two pages is not broken by a figure.

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7.3 Punctuation and Capitalization

- If the algorithm is clearly recognizable as a computer program (sometimes authors use `typewriter` font for this but not always), then stet the format, including inconsistent use of punctuation, acronyms, and hyphens. Query the author if the punctuation pattern appears to be internally inconsistent, i.e., if some elements end in periods and other, similar, elements do not.

- If the algorithm is written in regular, grammatical text, edit for punctuation and stylistic issues including acronyms and hyphens.

7.4 Individual Entries

Individual entries within the algorithm may be identified by number, by the word "step" and a number, or not at all. Stet the author's alignment of entries and runover lines, no matter how unusual. Successive lines often are indented. If no internal alignment is clear for such lines, indent them one em-space.

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7.5 Algorithm Examples

7.5.1 Typical algorithm

ALGORITHM FIND_MINIMUM_CHAINS(n).
begin
  if $n \leq 327{,}678$ **or** $\nu(n) \leq 16$ **then**
    $lb = \lambda(n) + \lceil \log_2 \nu(n) \rceil$
  else
    $lb = \lceil \log_2 n + \log_2 \nu(n) - 2.13 \rceil$
  end if
  $a_0 = 1$, $a_1 = 2$ (first two elements of an addition chain)
  loop lb_value
    determine pruning bounds
    $i = 1$
    loop find_chains
      if $i < lb$ **then**
        determine whether to retain a_i
        if a_i is retained **then**
          stack the possibilities for a_{i+1} in increasing order in next stack
            segment (all sums $a_j + a_k > a_i, k \leq j < i + 1$)
          increment i by 1
          let a_i be the element on top of the stack
          if $a_i = n$ **then**
            chain is found
            back up in the search tree until a node is found that needs further
              expanding (i.e., take the next element off the stack that is not
              in the stack segment of a_i)
          end if
      else
        back up in the search tree until a node is found that needs further
          expanding (i.e., take the next element off of the stack that is not
          in the stack segment of a_i)
        let a_i be the element on top of the stack
      end if
    end loop find_chains
    if no chains found then
      increase lb by 1
    else
      exit loop lb_value
    end if
  end loop lb_value.

7.5.2 Algorithm set as numbered figure

Algorithm. PREMATCHING

INPUT: The collection $\mathcal{S} = \{C_1, \ldots, C_k\}$ of subsets of U, with $2^k \geq 2n$.

OUTPUT: A partition matching M in $\mathcal{S}$.

1. $\mathcal{T} = \mathcal{S}$;

2. **while** $\mathcal{T}$ contains more than one set
   but does not consist of exactly three singular sets **do**

   Pick two sets C and C' of largest cardinality in $\mathcal{T}$;

   Pick an element a in C and an element a' in C';

   Pick two unused partitions of $\mathcal{S}$ of the forms $(\mathcal{A} \cup \{C\}, \mathcal{B} \cup \{C'\})$, and
   $(\mathcal{B} \cup \{C'\}, \mathcal{A} \cup \{C\})$, where $\mathcal{A} \cup \mathcal{B} = \mathcal{S} - \{C, C'\}$;

   Use the partition $(\mathcal{A} \cup \{C\}, \mathcal{B} \cup \{C'\})$ to left-pair a and right-pair a';

   Use the partition $(\mathcal{B} \cup \{C'\}, \mathcal{A} \cup \{C\})$ to left-pair a' and right-pair a;

   $C = C - \{a\}$; $C' = C' - \{a'\}$;

   If any of the sets C and C' is an empty set now, then delete it from the
   collection $\mathcal{T}$;

3. **if** $\mathcal{T}$ consists of exactly three singular sets $C_1 = \{a_1\}$, $C_2 = \{a_2\}$, and
   $C_3 = \{a_3\}$

   then Pick three unused partitions of $\mathcal{S}$ of the forms $(\mathcal{A}_1 \cup \{C_1\}, \mathcal{B}_1 \cup \{C_2\})$,
   $(\mathcal{A}_2 \cup \{C_2\}, \mathcal{B}_2 \cup \{C_3\})$, and $(\mathcal{A}_3 \cup \{C_3\}, \mathcal{B}_3 \cup \{C_1\})$ to left-pair a_1 and right-pair
   a_2, left-pair a_2 and right-pair a_3, and left-pair a_3 and right-pair a_1, respect-
   ively.

Figure 7.1: The algorithm PREMATCHING.

7.5.3 Grammatical text algorithm

ALGORITHM $\psi_{f-point(2)}$—NONOBLIVIOUS.

When r_i becomes active for the first time, it translates and rotates its coordinate system Z_i so that

1. r_i is at $(0,0)$ of Z_i, and

2. the other robot r_j is on the positive y-axis of Z_i, say, at $(0, a)$ for some $a > 0$.

Then it moves in the positive x direction of Z_i, over any nonzero distance. It then continues to move in the same direction each time it becomes active until it observes that the position of r_j has changed twice.

Now, r_i knows line ℓ that contains the first two distinct positions of r_j that r_i has observed. (Note that by symmetry ℓ is the x-axis of r_j's coordinate system Z_j.) Then using Lemma 3.2, r_i finds the initial position of r_j and moves to the midpoint of the initial positions of r_i and r_j.

Chapter 8

Lists

8.1 Numbering

Any consistent, unambiguous system is acceptable, including arabic and uppercase or lowercase roman numerals (1, I, i), uppercase or lowercase letters (A, a), Greek letters (α, β), asterisks, dots, or dashes (*, •, –).

- Identifying numbers or letters are enclosed in a complete set of parentheses or are followed by a period.

    (1)   1.   (2)   2.   (3)   3.

    If equations within the paper are single-numbered, choose the 1., 2., 3. option for lists to avoid confusion in citation.

- Ambiguity can arise if the author included several lists with repeated numbering; this is not an unusual scenario. In this case add qualifying citations, e.g., change *as in item* (1) to *as in item* (1) *in section* 2.2; query the author.

- Identifiers are lightface, never bold.

8.2 Type Style and Arrangement

- Stet lists set within a paragraph if the items are short. Break out longer items into a formatted list.

    Stet: It is convenient to split it into three regions: (1) Region A, $n, [n/2]$; (2) Region B, $[n/3]$; (3) Region C, $[n/(3 \cdot 2)], \ldots, [n/(3 \cdot 2^{lb-(i+2)})]$.

- **The first line of each list entry is indented.** Text runovers (text from an entry that runs over to subsequent lines) may be set flush left (so that each entry behaves like any other paragraph of text) or indented under the first word of the list entry. Decide which form of alignment to use by studying the entire manuscript carefully first. To save space, avoid indentation of runovers of long entries. See **List Examples.**

- The indentation for lists is slightly greater than for a paragraph indent and will not exactly match a paragraph indent.

- Retain the author's list style as long as it's consistent. If the paper is inconsistent, choose the most prevalent style and apply it.

- Do not mark to run a list item into the text above it. For example, stet the following arrangement:

  THEOREM 1.
  (a) *The approximant H in Theorem 2 is obtained by taking $S = 0$.*
  (b) *If we take $S = 0$, then we obtain $H = n$.*

  However, if the first item is run in after a heading, stet; don't mark it to start a new line.

- If the author used *and* or *or* before the last entry in a series, stet it. Do not add *and* or *or,* however.

- **Ensure that items within a list are parallel**—all phrases or all complete sentences, for example. They should follow in a logical pattern from the sentence above it; see **List Examples**.

- List items may complete an introductory sentence. See **List Examples.**

- Subitems are indented from the main items. Subitem identifiers may be any of the identifiers used for main items; ensure that the author's setup is clear. See **List Examples.**

- Equation numbers for displayed math in indented text are also indented. Don't try to make them fully flush left.

8.3   Punctuation and Capitalization

- Every entry must be punctuated. Use a comma or semicolon for phrases, and use a period or semicolon for complete sentences.

- Only entries that are complete sentences are capitalized.

8.4   Text Citation

- Identifying letters ((a), (b), (c)), including their parentheses, are roman in all text.

- Listed conditions, cases, etc., usually are cited with reference to the theorems or other items to which they belong: Theorem 3(b) refers to item (b) in a list within Theorem 3.

8.5 List Examples

8.5.1 Numbered, Flush-Left Runovers

1. Our definition should be essentially the same as Levin's notion when we apply it to polynomial time-bounds.

2. If L belongs to DTIME($T(n)$) for some time-bound T, then any distributional problem (L, μ) is T on the μ-average.

3. If L is not in DTIME($T(n)$) almost everywhere, then for any distibutional problem (L, μ), L is not T on the μ-average.

8.5.2 Bulleted, Indented Runovers

- For each **P**-time function ensemble $f : \{0,1\}^{t_n} \to \{0,1\}^{l_n}$ that instantiates primitive 1, $g^{(f)} : \{0,1\}^{t'_n} \to \{0,1\}^{l'_n}$ instantiates primitive 2.

- $g^{(f)}$ is a **P**-time function ensemble, and on inputs of length t'_n, it only makes calls to f on inputs of length t_n.

- Suppose A is an adversary with time–success ratio $\mathbf{R}'_{t'_n}$ for $g^{(f)}$ on inputs of length t'_n. Define $\mathbf{R}_{t_n} = \mathcal{S}(n, \mathbf{R}'_{t'_n})$. Then $M^{(A)}$ is an adversary with time–success ratio $\mathbf{R}_{t_n}$ for f on inputs of length t_n.

8.5.3 Introductory Colon, Lowercase Roman Numerals

Then we can describe G as follows:

(i) a description of this discussion in $O(1)$ bits;

(ii) the enumeration of all labels in at most $n^2/32$ (by assumption);

(iii) a description of the $n/2$ nodes in this enumeration in at most n bits;

(iv) the interconnection patterns of these $n/2$ nodes in $n/8 - 3\log n$ plus $n/2 + o(n)$ bits each (by assumption and using Claim 2.1); this amounts to $n/2(5n/8 - 3\log n) + o(n^2)$ bits in total with separations encoded in another $n\log n$ bits.

8.5.4 Greek Letters

α Nodes cannot be relabeled. For large scale distributed systems, relabeling requires global coordination that may be undesirable or simply impossible.

β Nodes may be relabeled before computing the routing scheme, but the range of the labels must remain $1, \ldots, n$. This model allows a bad distribution of labels to be avoided.

γ Nodes may be given arbitrary labels before computing the routing scheme, but the number of bits used to store the node's label is added to the space requirements of a node.

8.5.5   Items Continue Introductory Sentence

Putting together the results in this section, we have

- a reduction from a one-way permutation to a pseudorandom generator (from subsection 4.2);

- a reduction from a one-to-one one-way function to a pseudorandom generator (combining subsections 4.3 and 4.6);

- a reduction from a pseudorandom generator to a pseudorandom generator (from subsection 4.6).

The connected graph G is built by

    1. committing all uncommitted edges, as described above;

    2. joining the remaining open entry vertices with some number, Δ, of extra vertices so as to make G have n vertices and be d-regular; and

    3. designating one of these extra vertices as t.

8.5.6   Complex Items Follow Introductory Sentence

If (A1) and (A2) are satisfied where $\omega - \beta > 0$, then the following apply.

(i) For each $p' > 0$ and $T > 0$ the following inequalities are satisfied:

$$(8.1) \qquad \sup_{\alpha \in \mathcal{A}} \sup_{u \in \mathcal{U}} \mathbb{E}_{x,u}^{\alpha} \left[\sup_{0 \le t \le T} |X(t)|^{2p'} \right] \le C_T |x|^{2p'} + \tilde{C}_T$$

and

$$(8.2) \qquad \sup_{t \in \mathbb{R}_+} \sup_{\alpha \in \mathcal{A}} \sup_{u \in \mathcal{U}} \mathbb{E}_{x,u}^{\alpha}[|X(t)|^{2p'}] \le C_1 |x|^{2p'} + C_2.$$

(ii) For each $x \in H$, $\alpha \in \mathcal{A}$, and $u \in \mathcal{U}$ the following inequality is satisfied:

$$(8.3) \qquad \limsup_{t \to \infty} \frac{1}{t} \int_0^t |X(s)|^2 ds < \infty \qquad \text{a.s.} \quad \mathbb{P}_{x,u}^{\alpha}.$$

(iii) For each $x \in H$, $\alpha \in \mathcal{A}$, and $u \in \mathcal{U}$ there is a sequence $(K_n, \, n \in \mathbb{N})$ of compact sets in H such that

$$(8.4) \qquad \lim_{n \to \infty} \sup_{t \ge 1} \mathbb{P}_{x,u}^{\alpha}(X(t) \in H \setminus K_n) = 0$$

so the family of measures $(\mu_{X(t)}, \, t \ge 1)$ is tight where $\mu_{X(t)}$ is the probability law for $X(t)$.

8.5.7   Subitems

- Let $\mathcal{D} : \{0,1\}^n$ be a probability ensemble. There is a probability ensemble $\mathcal{E} : \{0,1\}^{nk_n}$ satisfying

$$- \, \mathbf{H_{Ren}}(\mathcal{E}) \ge k_n \mathbf{H}(\mathcal{D}) - n k_n^{2/3},$$

- $\mathbf{L_1}(\mathcal{E}, \mathcal{D}^{k_n}) \leq 2^{-k_n^{1/3}}$.

- Let $\mathcal{D}_1 : \{0,1\}^n$ and $\mathcal{D}_2 : \{0,1\}^n$ be not necessarily independent probability ensembles; let $\mathcal{D} = \langle \mathcal{D}_1, \mathcal{D}_2 \rangle$. A probability ensemble $\mathcal{E} : \{0,1\}^{2nk_n}$, with $\mathcal{E} = \langle \mathcal{E}_1, \mathcal{E}_2 \rangle$, satisfies the following:

  - For every value $E_1 \in \{0,1\}^{nk_n}$ such that $\Pr_{\mathcal{E}_1}[E_1] > 0$, $\mathbf{H_{Ren}}(\mathcal{E}_2 | \mathcal{E}_1 = E_1) \geq k_n \mathbf{H}(\mathcal{D}_2 | \mathcal{D}_1) - nk_n^{2/3}$.
  - $\mathbf{L_1}(\mathcal{E}, \mathcal{D}^{k_n}) \leq 2^{-k_n^{1/3}}$.

I. Nodes do not initially know the labels of their neighbors and use ports to distinguish the incident edges. This models the basic system without prior knowledge.

   IA. The assignment of ports to edges is fixed and cannot be altered. This assumption is reasonable for systems running several jobs where the optimal port assignment for routing may actually be bad for those other jobs.

   IB. The assignment of ports to edges is free and can be altered before computing the routing scheme (as long as neighboring nodes remain neighbors after reassignment). Port reassignment is justifiable as a local action that usually can be performed without informing other nodes.

II. Nodes know the labels of their neighbors and over which edge to reach them. This information is free. Or, to put it another way, an incident edge carries the same label as the node to which it connects. This model is concerned only with the additional cost of routing messages beyond the immediate neighbors and applies to systems where the neighbors are already known for various other reasons.

Chapter 9

Appendices

- Appendices are optional. They appear after the body of the paper but before Acknowledgments or References.

- An appendix may appear in the manuscript numbered as a section of the paper, appear without a number, or be identified by a roman numeral or letter. Any of these forms is acceptable. It is acceptable to have an Appendix A without subsequent Appendix A, B, C, etc.

  Appendix. A general problem is to characterize the conditions under which cryptographic. . . .

  Appendix A. The issue of isomorphisms of complete sets is an interesting topic. Berman and. . . .

  8. Appendix. Some of our main contributions—the improved leftover hash lemma and its use. . . .

  Appendix. Details of the blockwise converter. A property of such k-wise independent random variables. . . .

- Headings and other arrangement within the appendix are exactly like the rest of the paper. Numbering of figures, equations, etc., may continue from the body of the paper or appear as (A.2), etc.

9.1   Text Citation

The word *Appendix* is capitalized in a citation only if the cited appendix is numbered or lettered (which makes it a proper noun—it has a name).

See Appendix B.   See the appendix.

Chapter 10

Note Added in Proof

- A Note Added in Proof mentions results or sources that have come to the attention of the author after completion of the paper. It will appear either written on the margin of the galley proofs returned from the author or on a separate page attached to the proofs.

- The Note is the last item before references.

- The heading is set (paragraph indented) as

    Note added in proof.

    Treat the head as a section head, with an extra 6 points of space above it. It is followed by text arranged normally. Mark the text as if it were manuscript, conforming to the style used elsewhere in the paper.

- A note may include new reference citations. These should be set up like the other text citations (see **References**) and the references included in the original reference list.

- If a Note Added in Proof appears in a manuscript, stet.

- Refer all Notes to the Managing Editor, who will determine their appropriateness. Some Notes Added in Proof must be reviewed by the editor-in-chief.

Chapter 11

Errata

An erratum is an article (usually very short, and often only one or two pages) submitted to a journal that serves as a correction to an article previously published in that journal.

There are two kinds of errata. A mathematical erratum is a correction of the mathematical content of an article previously published by SIAM. This can be submitted by the author of the original article or by another researcher claiming to have found an error in the original author's paper. A publication erratum is a correction to an error made by SIAM's editorial or production department or by one of SIAM's compositors or printers.

Mathematical errata must be approved for publication by the editor-in-chief. (This is usually taken care of by the editorial assistant or publications manager before the erratum reaches a production editor.) The decision on publishing a publication erratum is usually made by the Journals Publisher.

11.1 Title, Running Heads, and References

The title of an erratum is "ERRATUM: [Title of Original Article]," and both running heads are "ERRATUM". Corrigendum is an acceptable equivalent to erratum; use the title "CORRIGENDUM: [Title of Original Article] and the running heads "CORRIGENDUM". If the author wishes to include key words and AMS subject classifications for an erratum, these generally are the same as those for the original article (unless the author wishes them altered). However, it is not necessary for an erratum to carry these items. The erratum must, however, include a DOI number and URL address. Those errata that go through the review process are logged into MTS and automatically receive a PII number. For those errata that do not need to be reviewed, the on-line services manager generates a DOI number for the erratum.

Spell out the citation of the original article in the abstract. In most cases, the original article must be one of the references (often it will be the only reference), and this reference must be cited in the text (usually at the very beginning).

Chapter 12

Editing Math

12.1 In General

12.1.1 Numbers

- Use digits for 10 and above, but for numbers less than 10, note the author's use of numerals and spelled-out numbers for any patterns. Treat numbers consistently within a paragraph.

  > The algorithm was tested four ways. Our result indicated that two of three random variables gave a positive result.

  > The algorithm was tested 4 ways. Our result indicated that 9 of 10 random variables gave a positive result.

  In most cases, however, you should stet the author's use of a numeral or a spelled-out number.

- Numerals, including Roman numerals (I, IV, XII), are always set roman.

- Use digits in the terms, e.g., *order*-2 and 2-*stage*.

- Use digits with all units of measure and time.

12.1.2 Variables

- Variables generally are italic (f) but may appear as bold roman ($\mathbf{f}$), bold italic ($\boldsymbol{f}$), roman (f), fraktur ($\mathfrak{f}$), calligraphic ($\mathcal{F}$), or blackboard ($\mathbb{F}$). Stet the author's usage (changing fake blackboard bold to true), but query the author about extensive use of roman variables.

  > Roman and italic variables: $\mathrm{E}[d^{(j)}(w, R, x \odot Y, Y) - e^{(j)}(w, R, Y)] = \delta_0^{(j)}(w)$

  > Bold and italic variables: $\sum_{j \in \{0, \dots, k_n - 1\}} c_j \geq k_n \mathbf{p}_n - k_n^{2/3} = m_n + k_n^{2/3}.$

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Bold, italic, and calligraphic variables:
$$\mathbf{L_1}(\mathcal{D}, \mathcal{E}) = \sum_{x \in S} |\Pr[\mathcal{D}(x)] - \Pr[\mathcal{E}(x)]| / 2.$$

12.1.3 Punctuation

- Delete commas appearing before $\forall$ or *for all.* However, . . .

- . . . stet commas enclosing a parenthetical *for all* phrase that precedes the relevant equation.

  Then (4.2) shows that, for all $x < 0$, the restriction would be $T_0 \leq T_1$.

- Set off conditions with commas. A condition is a phrase that restricts an item within an equation.

  $$z_k = \Phi^{-1}(e^{i\theta_k}), \qquad k = 1, \ldots, n+1,$$

  Since L^{-1} is triangular, the computation of $L^{-1}A$, $i = 1, \ldots, m$, takes $mn^3 + O(\max\{m, n\}^3)$ flops.

- Do not use a comma before verbal expressions after math, such as *if, when, for, such that.* Do use a comma before *where*, however, because it usually begins a nonrestrictive phrase.

  Incorrect: $f = 2(x)$, if $x < 1$

  Incorrect: . . . $a_i = a_j + a_k$ for some $k \leq j < i$, such that for every $i \geq 1$, . . .

- If consistent, stet the author's use of commas in numbers of four digits or more: 1000 or 1,000, 23000 or 23,000. Ensure that usage within tables is consistent with the text.

12.1.4 ldots and cdots

- Line dots (ldots) are used between variables with other punctuation.

  $$0, \ldots, n-1$$

- Centered dots (cdots) are used between operators.

  $$0 < \cdots < 2, \qquad x_1 + x_2 + \cdots x_n$$

- Stet the location of dots if there are no commas or operators.

  $$\pi(1, i)(u) = (a_1^{(1)} \cdots a_{j-1}^{(1)})$$

- Stet uneven spacing around ldots and cdots.

- Change ellipses (...) to ldots.

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12.1.5 Functions

- The functions given in Appendix A are always set roman—in roman and in italic text.

  Correct: THEOREM 8.5. *Assume that the sequence $\{\rho_k\}$ is bounded and* $\lim_{k\to\infty}|C_k| = 0$.

  Incorrect: THEOREM 8.5. *Assume that the sequence $\{\rho_k\}$ is bounded and $lim_{k\to\infty}|C_k| = 0$.*

- Author-created functions (those not included in Appendix A) may be italic. Treat them consistently.

  Assume that $(u_1, v_1) \in Ef$, $(u_2, v_2) \in Eb$, and $lev(u_1) = lev(u_2)$.

  (*lev* is an author-created function.)

- Stet italic superscript and subscript functions if used consistently.

  If a crossing is forced, then there is a node y on $P(x, wx_{min})$ and a node $z \in T_y$ with $lev(z) = lev(wx_{max})$.

- Subscripts are placed alongside, not beneath, functions in text:

  $\max_{\hat{P}\in C^{N-k+2}} \min_{\tilde{P}\in C^k} \rho(\tilde{P}\hat{P}) = \lambda_k$.

- Stet spacing around functions.

  The best bounds are achieved for $k \leq \log C$.

  We get an $o(p + (\Delta \log N))$.

12.2 Fences

- Fences are (), [], | |, {}, $\langle\,\rangle$, $\|\,\|$, $\lfloor\,\rfloor$, $\rceil\,\lceil$.

- Fences must occur in pairs. When editing, count the fences to make sure that every opening fence has a closing fence. If one is missing, add it (if it is obvious where it goes) or query the author.

- Fences may be mismatched. For example, stet (0,1].

- Change the incorrect use of $<$ and $>$ to angle brackets, $\langle\,\rangle$. Consult the managing editor if you do not know whether angle brackets or greater-than and less-than symbols are intended.

- Fences in math are roman.

12.2.1 Abbreviations

- Stet $\forall$ (which means "for all"), $\exists$ ("there exists"), and iff ("if and only if") if used consistently throughout the paper. If an author uses both the symbol and the full phrase, determine which is more prevalent and edit for consistency.

- $\forall$ and $\exists$ are used only within a math context. In general text use *for all* and *there exists*.

  There exists a permutation π, ψ such that $a_i + b_{\pi(i)} + c_{\psi(i)} = D$ holds $\forall\, i$.

  We say that Algorithm H has *worst-case performance guarantee* ρ if $\sup\{F^H(I)/F^*(I)\} \leq \rho(n)$ holds for all integers $n \geq 1$.

- Stet spacing around $\forall$ and $\exists$.

  A semirandom source with parameter α outputs bits $X_1 X_2, \ldots, X_R$ such that $\forall x_1, \ldots, x_i \in z$, α holds.

  If $\mathbf{X} = (X_1, \ldots, X_n)$ is sampled uniformly at random from S, then $\forall\, b_1, b_2, \ldots, b_3 \in \{0, 1\}$ the following holds.

- See Appendix C for common math abbreviations and their treatment.

12.3 In Text

12.3.1 Fences

- Avoid breaking math in text between fences. See *Mathematics into Type,* updated edition, pp. 42–43.

- Fences should be normal size in text, even though fractions, subscripts, or superscripts may extend past them.

  The solutions of (2.9), along with those of the corresponding equation for $H'_{z'}$, define TM-to-$\hat{z}$ ($H'_{z'} = 0$) and TE-to-$\hat{z}$ ($E'_{z'} = 0$) orthogonal polarizations.

12.3.2 Fractions

- Fractions in text may be case (stacked) or slashed.

  Case fraction:　　Let A_i be the depth of X_i in the N-tree so that $\frac{1}{n}\sum_{i=1}^{n} A_i$ is the average successful search time.

  Slashed fraction:　　Let A_i be the depth of X_i in the N-tree so that $(1/n)\sum_{i=1}^{n} A_i$ is the average successful search time.

- Slash complex fractions that cause excessive line spread.

Before: We see that if $nF\frac{n^{a^{\frac{1}{n}}}}{1_{a_{2_{x<0}}}} = 1$, then it suffices to pick F. However, for a lower bound it suffices to consider a subtree of the random pebbled hash tree.

After: We see that if $nF(n^{a^{1/n}}/1_{a_{2_{x<0}}}) = 1$, then it suffices to pick F. However, for a lower bound it suffices to consider a subtree of the random pebbled hash tree.

- Stet cased fractions in superscripts and subscripts if linespread is not excessive.

Koch showed that if each packet independently chooses a random destination, then the expected number of packets that get through is $\Theta(N/\log^{\frac{1}{q}} N)$. However, permutations may arise.

- Fractions need not be consistent (either case or slashed) throughout a paper, just within a math phrase.

- In slashed fractions, stet parentheses or lack of parentheses—$1/2a + b$ or $1/2(a + b)$—unless the same construction is inconsistent within the paper, in which case query the author.

- Mark math set as display within text to be text style.

Correct: Furthermore, $f^*(t) = \frac{b-\lambda_1 sP}{b}$. Consequently, $1 = f^* \leq \frac{b-\lambda_1 sP}{b}$.

Incorrect: Furthermore, $f^*(t) = \dfrac{b - \lambda_1 sP}{b}$. Consequently, $1 = f^* \leq$ $\dfrac{b - \lambda_1 sP}{b}$.

Correct: . . . must occur, where $g = \lceil \frac{d+(q-2b)f-(b-1)k-(b-1)\log N}{b} \rceil$. First, . . .

Incorrect: . . . must occur, where $g = \lceil \dfrac{d + (q - 2b)f - (b - 1)k - (b - 1)\log N}{b} \rceil$. First, . . .

12.3.3   Matrices

- Stet two-level matrices, with or without superscripts and subscripts, in text. Display matrices of more than two levels.

Two-level matrices: Using the inequality $\binom{x}{y} \leq (ex/y)^y$ to bound $\binom{L+g}{g}$ and $\binom{g+k}{g}$, and using $\binom{x}{y} \leq x^y/y!$ to bound $\binom{2^{d_i}}{b}$, the product is at most . . .

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Three-level matrix: Another possibility is $\begin{pmatrix} x1 & x1 \\ x21 & x22 \\ & x \end{pmatrix}$, as shown in [14].

(This type should be marked to be displayed.)

- Do not increase the size of fences in text to fully enclose a matrix; doing so may cause excessive linespread. Mark large fences around in-text matrices to be text style.

Correct: The determinant of M is an antisymmetric polynomial of degree $\binom{d+1}{2} + 1$ in the variables x_i, and it is divisible by $(x_i - x_j)$ for all $i < j$.

Incorrect: The determinant of M is an antisymmetric polynomial of degree $\left(\genfrac{}{}{0pt}{}{d+1}{2}\right) + 1$ in the variables x_i, and it is divisible by $(x_i - x_j)$ for all $i < j$.

12.3.4 Summations, Integrals, Unions, and Products: $\sum$, $\int$, $\bigcup$, and $\prod$

- In text, summations, integrals, unions, and products are set smaller than in display math. Any limits are set to the right side.

  However, q can be approximated by $\sum_{k=1}^{n(\alpha)} \theta_k^\alpha q_k^\alpha$ (as $\alpha \to 0$).

  Then, $\int_0^1 f(x)dx$ is simply the area, A_x, of the set R_x of points of W that are m-dark with respect to horizontal cuts.

  A subset $B \subset X$ is said to be in the *boundary* of $\mathcal{F}$ if $B \notin \mathcal{F}$ but $B \cup \{x_i\} \in \mathcal{F}$ for some x_i.

  This is equivalent to multiplying (4.1) by $\prod_{i=1}^g \frac{1}{2^{bd_i}}$.

- Don't mistake a capital sigma, Σ, for a summation or a capital pi, Π, for a product. Check with the managing editor or query the author if you are unsure.

12.3.5 Breaking equations

- When line breaks occur within math, TeX automatically breaks after operators. Stet the location of these operators; don't try to force them onto the next line.

- Try to avoid line breaks within fences, rewriting text around equations if necessary.

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12.4   In Display

Display equations may be numbered or not. Numbering may be sequential throughout the paper, such as (1), (2), (3), or by section—(1.1), (1.2)...(3.1), (3.2). Equations are not numbered concurrently with any other elements.

Don't run in an equation the author has displayed.

12.4.1   Equation Numbers

- Equation numbers are not required. Do not add numbers to unnumbered equations.

- Equation numbers are set to the left of displayed math. Move equation numbers that are set to the right.

- Stet the vertical location of equation numbers if the placement is not confusing. An equation number may align with the first or last line of an equation or may be vertically centered on the equation.

- Stet author's use of subscripts to refer to the number of a displayed equation within a display, e.g., $(3.2)_2$ as the second equation within (3.2).

- Letters and words may be used as equation numbers.

$$(C) \qquad b_i = \begin{cases} \lceil n/(3 \cdot 2^{lb-(i+2)}) \rceil, & 0 \leq i \leq lb - t - 2, \\ \lceil n/2^{lb-i} \rceil, & lb - t - 1 \leq i \leq lb. \end{cases}$$

  Stet the font of the letter or word both in the display and when mentioned in text (but do ensure that the style for the same equation name is consistent throughout).

12.4.2   Spacing

- There should be approximately 1.5 lines (base to base) of space above and below, or between, displayed equations. TeX sometimes will adjust this spacing because of other considerations. Of greatest importance is that the space above and below is equal.

- There is a two-quad (four-letter) space between two separate equations on one line and between an equation and a condition on that equation. However, if the author consistently used just one quad (two-letter) space, stet.

Correct:

$$\gamma'(s) = \sum_{n=b+1}^{\infty} \frac{f_n}{n!} s(s+1)\cdots(s+n-1) \sum_{i=0}^{n-1} \frac{1}{s+i}, \qquad s \notin \{-2, -3, \ldots, -b\}.$$

Correct:

$$T[x_i, \bar{x}_i] \geq 2r, \qquad T[x_i, h_i] \leq r$$

Stet:

$$T[v, x_i] \leq r + 1, \quad T[v, \bar{x}_i] \leq r + 1 \quad \text{for all } i$$

- Three or more separate equations on the same line are separated by a quad space.

$$T[x_i, \bar{x}_i] \geq 2r - \delta, \quad T[x_i, h_i] \leq r + \delta, \quad T[\bar{x}_i, h_i] \leq r + \delta$$

- A preposition has a minimum of a word space on either side; a quad space before and a word space after is fine, as is a quad space both before and after.

  Stet:

$$X_i(z) = \left(\frac{\pi(i)z}{1 - (1 - \pi(i))z} \right)^b \quad \text{for} \quad i < j$$

- Spacing is consistent around conjunctions. A word space, a quad space, or a two-quad space is acceptable as long as it's consistent on both sides.

- Stet spacing around operators and before punctuation in displays unless it's extremely tight or loose.

- Stet spacing of equations and phrases bracketed by a left brace as long as it's consistent and not confusing.

$$\begin{cases} u_t - \delta u_{xxt} + auu_x = 0, & (x,t) \in \Omega \times (0, t_1), \\ u = 0, & (x,t) \in \partial\Omega \times (0, t_1), \\ u(x,0) = \varphi(x), & x \in \Omega, \end{cases}$$

- Stet spacing around functions.

12.4.3 Breaking and Aligning Equations

Generally, multiline equations are aligned on operators—verbs $(=, >, <, \leq, \geq)$ are aligned with each other and conjunctions $(+, -, \times)$ are aligned with each other. See *Mathematics into Type,* pp. 45–48.

$$\begin{aligned} G_m(t) &= \frac{B_m(t)}{m} \\ &= \frac{1}{t}\widehat{\omega}(t, s_0(t))m^{-1-s_0(t)} + e^{-t} \sum_{k \neq 0} \frac{1}{h(s_k(t))} \Gamma(s_k(t))\widehat{\omega}(u, s_k(t))m^{-1-s_k(t)} \\ &\quad + O\left(\frac{\log m}{m} \right) \\ &= \frac{1}{t}(t-1)m^{-1-s_0(t)} + e^{-t} \sum_{k \neq 0} \frac{1}{h(s_k(t))} \Gamma(s_k(t))\widehat{\omega}(u, s_k(t))m^{-1-s_k(t)} \\ &\quad + O\left(\frac{\log m}{m} \right) \\ &= m^{-1-s_0(t)} + e^{-t} \sum_{k \neq 0} \frac{1}{h(s_k(t))} \Gamma(s_k(t))\widehat{\omega}(u, s_k(t))m^{-1-s_k(t)} + O\left(\frac{\log m}{m} \right). \end{aligned}$$

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$$ED_m(D_m - 1) = \frac{\widetilde{W}(m)}{m} + O(1) = \frac{1}{h_1^2} \log^2 m$$
$$+ 2\frac{1}{h_1} \left(\frac{h_2 - h_1^2}{h_1^2} - \frac{1}{h_1}\widehat{\gamma}'(-1) + \frac{\gamma - 1}{h_1} \right) \log m$$
$$+ 2\sum_{k \neq 0} \frac{\Gamma(s_k)\widehat{\gamma}(s_k)}{h^2(s_k)} m^{-1-s_k} \log m + O(1).$$

- Stet the alignment of multiline or multiequation displays if the author appears to have intentionally aligned them on the left, right, or verb sign, or centered them, if the sense is clear.

- Consecutive equations that are numbered individually may be aligned with each other.

$$(12.1) \qquad e_j - e_{j-1} - k_j\dot{e}(\tau_j) = \int_{t_{j-1}}^{t_j} \int_{\tau_j}^{t} \ddot{x}(s)\, ds\, dt,$$

$$(12.2) \qquad e_j - 2e(\tau_j) + e_{j-1} = \int_{\tau_j}^{t_j} \dot{e}(t)\, dt - \int_{t_{j-1}}^{\tau_j} \dot{e}(t)\, dt,$$

- Rebreak and indent and align equations properly if lines break within fences or if lines break the margin by more than 1 pica. If correcting a break within fences adds an extra line or introduces a new bad break, stet.

Before:

$$ED_m = \frac{\widetilde{X}(m)}{m} + O\left(\frac{\log m}{m}\right) = \frac{1}{h_1}\log m + + \frac{\gamma - 1}{h_1} + \sum_{k \neq 0} \frac{\Gamma(s_k)\widehat{\gamma}(s_k)}{h(s_k)} m^{-1-s_k} + O\left(\frac{\log m}{m}\right).$$

After:

$$ED_m = \frac{\widetilde{X}(m)}{m} + O\left(\frac{\log m}{m}\right)$$
$$= \frac{1}{h_1}\log m + \frac{\gamma - 1}{h_1} + \sum_{k \neq 0} \frac{\Gamma(s_k)\widehat{\gamma}(s_k)}{h(s_k)} m^{-1-s_k} + O\left(\frac{\log m}{m}\right).$$

12.4.4   Matrices

Matrices may **never** be broken. If a displayed matrix breaks the margin, instruct the comp to reduce the point size to fit the margin. Each reduction in point size lessens the width by 10

12.4.5   Punctuation

Each display equation reads as a clause or sentence and is punctuated accordingly. Authors, however, often leave display math unpunctuated. Insert commas and periods as needed so that the equation(s), the preceding text, and the following text together read grammatically.

- Don't add a comma after every displayed equation that does not end with a period. Consider the surrounding text. Recall that a comma never precedes *for all,* $\forall$, or a preposition.

- Although two displayed equations separated by the word *and* may read as a compound sentence, do not add a comma before the *and.*

- Use a serial comma with three or more displayed equations.

- Do not use a comma before prepositions within equations.

- Punctuate each line of a left-braced multiline equation. Do not punctuate lines within a right-braced equation, but stet if the author did so.

- Don't introduce a display equation with a colon if the introductory sentence continues after the equation. It's okay to use a colon if the equation is followed immediately by a *where* list or other qualifiers or conditions directly related to the equation.

  Correct: Treating the problem naively, the equations of motion become

  $$m\frac{dv}{dt} \in mg\sin\theta - mg\cos\theta\, \mathrm{Sgn}\, v \begin{cases} \mu_{dynamic} & \text{if } v \neq 0, \\ \mu_{static} & \text{if } v = 0, \end{cases}$$

  and the right-hand side contains the right-hand side for the original friction model (1.1).

  Correct: Part of these computations involve forming the differential measure of the energy:

  $$d\left(\frac{1}{2}v^T M(q)v + V(q)\right) = \frac{1}{2}(v^+ + v^-)M(q)\,dv + \frac{1}{2}v^T\left(\frac{d}{dt}M(q)\right)v\,dt,$$

  where the first term comes from a result of Moreau.

  Incorrect: This gives differential equations and inclusions:

  $$\frac{dq}{dt} = \frac{1}{m}p,$$
  $$\frac{dp}{dt} \in -\partial\psi(q) - g,$$

  but note that $\partial\psi(q) = \{0\}$ if $q > 0$, $\partial\psi(q) = \mathbb{R}_+$ if $q = 0$, and $\partial\psi(q) = \emptyset$ if $q < 0$.

  Correct: This gives differential equations and inclusions:

  $$\frac{dq}{dt} = \frac{1}{m}p,$$
  $$\frac{dp}{dt} \in -\partial\psi(q) - g.$$

  Note, however, that $\partial\psi(q) = \{0\}$ if $q > 0$, $\partial\psi(q) = \mathbb{R}_+$ if $q = 0$, and $\partial\psi(q) = \emptyset$ if $q < 0$.

12.4.6 Fences

- Fences should be as large as the material enclosed by them.

  Correct:
  $$\frac{B_n \log B_n}{\log T'(n)} = o\left(\beta_n \cdot \frac{\log\log T'(n)}{\log T'(n)}\right) = o(1).$$

  Incorrect:
  $$\frac{B_n \log B_n}{\log T'(n)} = o(\beta_n \cdot \frac{\log\log T'(n)}{\log T'(n)}) = o(1).$$

- Do not increase fences to encompass superscripts and subscripts, but stet if the author did so.

  Acceptable:
  $$k_n c_n - \mathbf{H}(f'^{k_n}(\mathcal{X}'), b^{k_n}(\mathcal{X}', Y'))$$

  Acceptable:
  $$k_n c_n - \mathbf{H}\left(f'^{k_n}(\mathcal{X}'), b^{k_n}(\mathcal{X}', Y')\right)$$

  Acceptable:
  $$\mathrm{E}\left[\sum_{j \in \{0,\ldots,k_n-1\}} \epsilon^{(j)}\right] \geq 2\rho k_n = \delta_n/8.$$

  Acceptable:
  $$\mathrm{E}\left[\sum_{j \in \{0,\ldots,k_n-1\}} \epsilon^{(j)}\right] \geq 2\rho k_n = \delta_n/8.$$

12.4.7 Fractions

- Try to stack or case fractions consistently within the equation only. Fractions do not need to be treated consistently throughout the paper.
  Stacked fractions:
  $$\sum_{s=1}^{\infty} \frac{1}{3}\left(\frac{2}{3}\right)^{s-1} sn \leq 4n.$$

  Case fraction:
  $$\mathrm{pr}(E_v) > \tfrac{1}{3}\log^6 \Delta$$

- Slashed fractions should be changed cautiously. Consult with the author.
  Slashed fractions:

  $$L((2i-1)\pi/n), \ L((2j-1)\pi/n), \ L((2k-1)\pi/n),$$

  $$\mathrm{E}\{L\} = (n-1)\mathrm{P}\{B(n-1, 1/(n-1)) = 2\}$$

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- Numerators or denominators of stacked fractions may be slashed or cased.

- Stet case and slashed fractions in superscripts and subscripts in displayed math. They need not be the same style as the full-size fractions but should be styled consistently within the same display.

  Case fractions:
  $$X(z) = \frac{1}{2\pi i} \int_{-\frac{3}{2}-i\infty}^{-\frac{3}{2}+i\infty}$$

  Slashed fractions:
  $$c_j \geq k_n \mathrm{p}_n - k_n^{2/3} = m_n + k_n{}^{2/3}.$$
  $$SP \nsubseteq RC[N^{1/4}/b, 2^{N^{1/4}/b}]$$

- Stet small integrals and summations in the numerators and denominators of stacked fractions (be consistent within the equation).

  $$v_0, \ldots, v_k = v_0 \text{ of } \frac{\sum_{i=1}^k C_{v_{i-1}, v_i}}{\sum_{i=1}^k C_{v_i, v_{i-1}}}.$$

- Stet case fractions in the numerators and denominators of stacked fractions (be consistent within the equation).

  $$h = \frac{1}{\frac{1}{a} + \frac{1}{b}} = \frac{ab}{a+b}$$

12.4.8 Summations, Integrals, Unions, and Products: $\sum$, $\int$, $\bigcup$, and $\prod$

- In display, summations, integrals, unions, and products are usually set full size.
  $$\sum_{|x| \geq n} \mu'(x) \cdot \frac{T^{-1}(f(x))}{|x|} \leq W_n$$

  $$\int_0^{1/3} \int_0^{1/3} r(x,y)\, dx dy = 1$$

  $$\prod_{i=1}^k q_{D_i}(f_i, \mathcal{T}_{\lceil_\rangle})$$

  They may appear text size in multiline equations.

- Limits are set above and below summations, unions, and products. They are set alongside integrals.

- Stet small integrals and summations in the numerators and denominators of stacked fractions (be consistent within the equation).

  $$D_i(x) = \frac{\alpha_{r_i(x)}^i}{\sum_y \alpha_{r_i(y)}^i}$$

- Don't mistake a capital sigma, Σ, for a summation or a capital pi, Π, for a product.

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12.4.9   Diagrams

Unlike displayed equations, diagrams are not punctuated.

The following is an example of an alignment of three strings `ATTCGAC`, `TTCCGTC`, and `ATCGTC`:

```
A   T   T   -   C   G   A   -   C
-   T   T   C   C   G   -   T   C
A   -   T   -   C   G   -   T   C
```

The trie implementation of $D(P, \mathcal{Q}_P)$ would be as follows:

$D(P, \mathcal{Q}_P)$:

$\{(1,2),(2,1)\}$ $\{(1,1)\}$ $\{(2,2)\}$
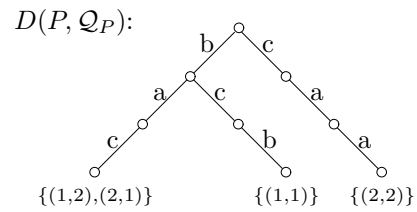
Chapter 13

Figures

13.1 Numbering

Figures may be numbered consecutively throughout the paper or by section. The numbering may require adjustment for several reasons.

- Correct gaps or duplications in numbering and adjust the text citations.

- An author may include a drawing not identified as a figure. If this is more than merely a complex equation display, add the appropriate figure number and adjust the other figure numbers. In a query, call the author's attention to your changes, ask if a caption is available, and ask for the figure to be called out in text, if necessary.

- Stet complex mathematical displays that look like figures but are not treated as such.

  Consider some section S and the sections from which it may receive packets after step 3:
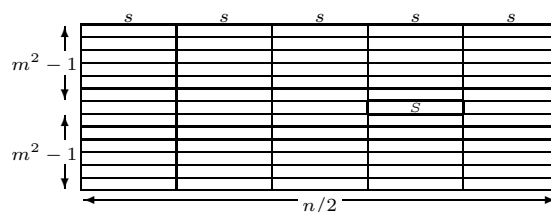
  $(2 \cdot m^2 - 1) \cdot n/2$ *packets are stored in these sections, among which are the s packets with destination in S.*

- The author may have numbered tables as figures. Relabel and renumber these appropriately.

- Rarely, an author may assign two figure numbers to figures that share a caption. Identify these as one figure with parts (a) and (b).

- Rarely, an author may number figures sequentially with mathematical items. Renumber these figures and mathematical items. In a query, make the author aware of your changes and ask for approval.

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- Section-numbered figures (1.2, 3.5, e.g.) appear in the appropriate section—Figure 4.8 appears in section 4, for example. If a section-numbered figure cannot be made to fit within its section, change all figures to single numbering; change the citations as well. Note the change on the back of the cover sheet.

13.2   Captions

A caption begins with FIG., followed by a number and a period. The caption text is 8-point italic, capitalized as normal text. The caption ends with a period. It is always located under the figure, centered if shorter than one line, beginning with a paragraph indent if longer. A figure may have parts ((a), (b)) with separate captions. The captions may be centered separately under the parts or run together and set under the entire figure. All figures in one paper should be treated alike, however, and normally the author's arrangement should be respected. A caption is not required.

Normal: FIG. 1. *The Clos network.*

A continued figure: FIG. 1. *(cont.)*.

A multipart figure legend (note that the figure part letters are roman):

FIG. 1. *Applicable networks:* (a) *the Clos network and* (b) *the Benes network.*

A figure with no caption: FIG. 1.

13.3   Permissions

Occasionally authors reprint figures from other sources. The author is responsible for obtaining a letter from the copyright holder (usually the publisher of the original book or journal) granting permission to reprint the figure. A permission line must be added to the caption, giving credit to the original source. Sometimes publishers request specific wording for these lines; this wording is given in the permission letter. If no specific wording is requested, the line takes the form "Reprinted with permission from S. Sridhar [the original owner of copyright—this may be an individual, a publication, or a publisher]."

   If you suspect a figure has been borrowed from another source but there is no permission letter, query the author. The Publisher may have to request permission. Permission letters should be stapled to the copyright agreement, and both are saved indefinitely.

13.4   Text Citation

- Figures are cited without abbreviations, e.g., Figure 3.2.

- In-text citations to multipart figures appear as, e.g., "Figure 3.4(a)."

- Change citations such as "in the diagram below" to, e.g., "in Figure 3.4."

- List the figures on the back of the manuscript cover sheet. Check off each one as it's called out in the text. Highlight the first citation of each figure in yellow.

- If a figure is not cited in the manuscript, try to determine from context where it belongs and insert the citation. Query the author whether the location is appropriate. If you can't determine where the figure should be cited, query the author before the manuscript goes to the comp.

13.5 Sizing, Placing, and Altering Figures

The maximum width for a figure is 31 picas. The maximum depth is 51.1 picas. Generally, figures appear in the finished paper near where they are first cited— on the same page or following, but not preceding. Figures may have to precede their citations if many figures are grouped near the end of a section or a paper. **Figures may appear at the top, bottom, or middle of a page**, but they never appear midparagraph in the middle of a page. (This rule does not apply when figures appear at the top or bottom of a page, because paragraphs are often broken with a page break.)

Section-numbered figures (1.2, 3.5, e.g.) appear in the appropriate section— Figure 4.8 appears in section 4, for example. If a section-numbered figure cannot be made to fit within its section, change all figures to single numbering; change the citations as well. Note the change on the back of the cover sheet.

Individual figures normally do not run side by side (that is, Figure 1 next to Figure 2). However, if the author set the art that way, stet the setup. Consider running figures side by side when you have several very small figures that may take up considerable space if placed separately. Stet the figure's placement on the page, as long as is does not appear midparagraph.

Electronic art—either figures embedded in the TeX file or PostScript (.ps) or encapsulated PostScript (.eps) figures—may be resized to improve presentation or clarity. Electronic art also may be altered within limits.

Nonelectronic art—figures supplied as hard copy, or photographs—must be marked for the comp, indicating the final size and the placement within the paper.

13.5.1 Electronic Art

- Generally, electronic art is not resized, but if the figure is unusually large ask the comp to "reduce to [width or height in picas]."

- Make similar figures the same size, and make two similar images within one figure the same size. This improves the presentation of the paper. See Figure 13.1.

- The general rule is that no text within art is smaller than 7 point. Ask the comp to enlarge a figure in which, for example, the axis labels are too small to be read. See Figure 13.2.

- Assess all figures for quality—will they reproduce well? Ask the comp to darken light lines that may break up when the journal is printed. See Figures 4 and 5.
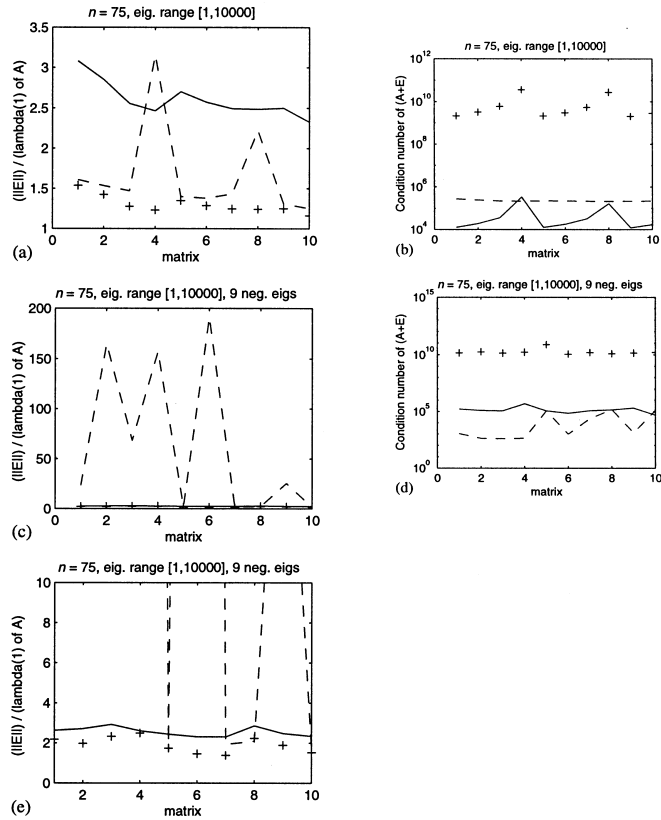
FIG. 6. (a), (b): *Performance of existing and new methods on 10 matrices, each containing one negative eigenvalue.* (c)–(e): *Performance of existing and new methods on 10 matrices, each containing nine negative eigenvalues. Methods: GMW81* ———, *SE90* − − −, *revised SE90* + + +.

Additionally, it has proved to be useful in ensuring that the Winget factors within element-by-element preconditioners are definite [6], and it has been implemented in a block version of the factorization [5]. Finally, the results of this paper show that the new algorithm may be a useful way to obtain rough estimates of $-\lambda_1(A)$ in cases where this is useful, for example, in some trust region methods. For general optimization applications, both factorizations are likely to continue to be used; the lower a priori

Figure 13.1: For this figure ask the comp to make the two graphs on the right the same size as the graphs on the left.
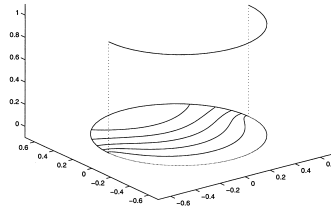
Figure 13.2: Ask the comp to enlarge a figure in which the labels are too small to be read.

Labels

Labels refer to text within a figure—axis numbers, math, identifying text. **Don't edit the labels of electronic figures.** Making changes to the labels in PostScript files can be difficult and time consuming. For both electronic and nonelectronic art, limit your edits to the correction of misspellings; stet hyphenation and other style issues that are inconsistent with the rest of the paper.

13.5.2 Nonelectronic Art

Figures provided as hardcopy and photographs must be prepared for scanning by the comp.

(1) Look through the folder and use the best-quality art provided.

(2) Label each figure with the journal name, manuscript number, first author name, and figure number. Labels for this purpose are available at p:editoria\prdctn\figlabels.doc. Place the label well outside the image area.

(3) Clean up the art as necessary—white out any dirt marks. Do not edit in any way.

(4) Size the art. If the image is more than 31 picas wide it will have to be reduced. Calculate the percentage at which the figure will be sized by dividing the desired width of the figure by its actual width. For example, a figure that is 35 picas wide and that is to be reduced to 31 picas would be sized at 88% ($31 \div 35$). Provide the comp with this reduction percentage.

(5) In the margin of the manuscript at the callout for each figure, instruct the comp to insert the figure and indicate how much vertical space the figure will require. Calculate the vertical space by using the percentage arrived at in step (4): for example, if that same figure is 20 picas deep, at 88% it will be 17.6 picas deep. Round up to the next .5 pica to ensure enough space is left in the TeX file.

(6) Provide instructions to the comp for inserting the caption. If the captions are on a separate page, note to, e.g., "Insert caption from p. 26." The caption may be photocopied and taped to the margin of the page.

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(7) Provide as much information as possible to the comp. For example, if a figure has multiple parts suggest a layout. Ask for part labels ((a), (b), (c)) as necessary.
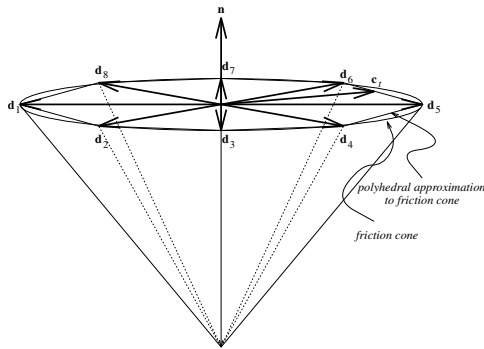
Figure 13.3: Several rules in this figure may be too light to print well. Ask the comp to darken these lines. However, if the author used rules of varying weights, as in this case, make sure the contrast is maintained.
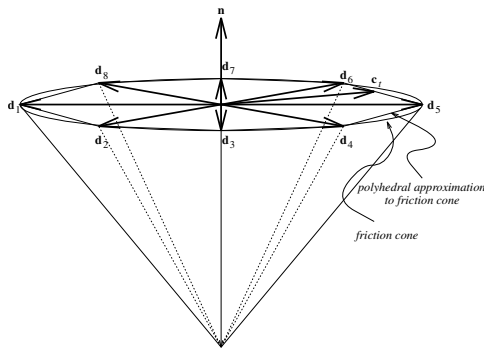
Figure 13.4: The figure has been darkened and the lighter lines should print better.

Chapter 14

Tables

Tables are almost always embedded in the TeX file. (See **Figures, Nonelectronic Art** for handling camera-ready tables.) All tables are set in 8-point type. Tables that break the margin by more than 2 picas may be reduced to 7-point or 6-point type. A reduced table that is still too wide may be rotated and broadside on the page; return a rotated table to 8-point type if possible.

Generally, tables appear near where they are first cited—on the same page or following, but not preceding. Tables may have to precede their citations if many tables are grouped near the end of a section or a paper. Tables never appear midparagraph in the middle of a page.

14.1 Numbering

Tables may be numbered consecutively throughout the paper or by section. Tables numbered by section must fall within that section. The numbering may require adjustment for several reasons.

- Correct gaps or duplications in numbering and adjust the text citations.

- The author may have numbered tables as figures. Relabel and renumber these appropriately.

- Change roman numerals or letters to the appropriate arabic numerals.

- Stet unnumbered tables. Don't change the type size to 8-point type on unnumbered tables, and stet boxes around unnumbered tables. (Tables of this kind often appear in SICOMP.)

- Sometimes authors label tables as "Problems," etc., with corresponding in-text items presenting this same tabular information in verbal form. In this case, it is often necessary to the sense of the presented information to leave the tables unconventionally labeled and numbered as problems.

- Tables numbered by section that cannot be made to fit within that section are renumbered consecutively throughout the paper.

14.2   Captions

TABLE followed by an arabic number is centered above the table. The caption, set in 8-point italic and beginning with a capital letter, is centered beneath the number. If the caption is two or more lines, the first line is paragraph indented. The caption ends with a period. Stet a table without a caption.

Normal:

TABLE 2.1

Placement of the parallels.

A continued table: TABLE 1. (*cont.*).
A table with no caption: TABLE 1

14.3   Permissions

Occasionally authors reprint tables from other sources. The author is responsible for obtaining a letter from the copyright holder (usually the publisher of the original book or journal) granting permission to reprint the table. A permission line must be added to the legend, giving credit to the original source. Sometimes publishers request specific wording for these lines; this wording is given in the permission letter. If no specific wording is requested, the line takes the form "Reprinted with permission from S. Sridhar [the original owner of copyright—this may be an individual, a publication, or a publisher]."

If you suspect a table has been borrowed from another source but there is no permission letter, query the author. The Publisher may have to request permission. Permission letters should be stapled to the copyright agreement, and both are saved indefinitely.

14.4   Text Citation

- Tables are cited as, e.g., Table 2, with no abbreviations.

- Change citations such as "in the table below" to, e.g., "in Table 2.2."

- List the tables on the back of the manuscript cover sheet. Check off each one as it's called out in the text. Highlight the first citation of each table in yellow.

- If a table is not cited in the manuscript, try to determine from context where it belongs and insert the citation. Query the author whether the location is appropriate. If you can't determine where the table should be cited, query the author before the manuscript goes to the comp.

14.5   Headings

- Column and row headings are set lightface roman; only the first letter of the first word is capitalized.

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- Column headings are centered over their columns; stet author's location of row headings as long as they are consistent within the table.

- Edit headings so that usage and style are consistent with the rest of the paper. Abbreviations may be necessary and are permissible.

- Ensure that headings do not smack (bump into) the rules. Ask the comp to add space.

- Ensure that capitalization, abbreviation, and general arrangement within similar tables are consistent.

14.6   Table Body

Stet the author's table layout. Ensure that table elements are consistent with style and usage in the rest of the paper (stet in a camera-ready table).

14.7   Table Rules

Horizontal rules must be present after the title, below column heads, and at the end of the table. Insert any that are missing. Stet other rules. Sometimes vertical rules and additional horizontal rules may be needed for clarity. Ensure that text in tables does not smack the rules.

Chapter 15

References

15.1 Format

The three acceptable reference labeling formats are number in brackets, initials or abbreviations (with or without numbers, hyphens, +, or dates) in brackets, and name followed by date in parentheses, as follows:

[1]   F. BERGERON, J. BERSTEL, S. BRLEK, AND C. DUBOC, *Addition chains using continued fractions*, J. Algorithms, 10 (1989), pp. 403–412.

[BBBD]   F. BERGERON, J. BERSTEL, S. BRLEK, AND C. DUBOC, *Addition chains using continued fractions*, J. Algorithms, 10 (1989), pp. 403–412.

[Mal89a]   S. MALLAT, *Multiresolution approximations and wavelet orthonormal bases of $L^2(\mathbb{R})$*, Trans. Amer. Math. Soc., 315 (1989), pp. 69–87.

[Mc+]   W. D. MCQUAIN, R. C. MELVILLE, C. J. RIBBENS, AND L. T. WATSON, *Preconditioned iterative methods for sparse linear algebra problems arising in circuit simulation*, Comput. Math. Appl., 27 (1994), pp. 25–45.

F. BERGERON, J. BERSTEL, S. BRLEK, AND C. DUBOC (1989), *Addition chains using continued fractions*, J. Algorithms, 10, pp. 403–412.

Because of TEXnical difficulties, the indention scheme of the references in this chapter doesn't necessarily match that of journals. The first line is flush left, and subsequent lines are indented 15 points under the start of the author name.

15.2 Print Publications

Note fonts, punctuation, capitalization, and ordering in each type of reference.

15.2.1 Journal Articles

author, article title, abbreviated journal title, volume number, year (unless included after author's name), page numbers (preceded by "pp.") or article number.

[4] K. KUNISCH AND E. W. SACHS, *Reduced SQP methods for parameter identification problems*, SIAM J. Numer. Anal., 29 (1992), pp. 1793–1820.

[DeM] M. DE MENECH, *Modeling of droplet breakup in a microfluidic t-shaped junction with a phase-field model*, Phys. Rev. E, 73 (2006), 031505.

X. Garbet (1997), *Towards a full self-consistent numerical simulation of tokamak plasma turbulence*, Plasma Phys. Control. Fusion, 39, B41.

[5] W. Huang, *Moving mesh methods based on moving mesh PDEs,* J. Comput. Phys., submitted.

L. Greengard, J. Strain, and G. Hedstron, *The fast Gauss transform: An algorithm for assessment,* SIAM J. Sci. Comput., to appear.

15.2.2   Chapters in Books

author, article title, "in" book title, editors, publisher, city, state (in most cases), year, page numbers

[5] J. G. Sun, *The matrix eigenvalue problem,* in Matrix Problems, T. F. Chan, ed., Academic Press, New York, 1989, pp. 12–15.

[MoWu96] J. J. Moré and Z. Wu, *ϵ-optimal solutions to distance geometry problems via global continuation*, in Global Minimization of Nonconvex Energy Functions: Molecular Conformation and Protein Folding, P. M. Pardalos, D. Shalloway, and G. Xue, eds., American Mathematical Society, Providence, RI, 1996, pp. 151–168.

15.2.3   Articles in Conference Proceedings

author, article title, "in" title of proceedings or conference, location of conference (optional), date, publisher or sponsoring organization, page numbers (optional)

[7] J. G. Sun, *The matrix eigenvalue problem,* in Proceedings of the 12th ACM Symposium on Theory of Computing, White Plains, NY, 1989, pp. 12–15.

[8] M. Y. Ying, *The least squares problem,* in Proceedings of the Third SPIE Conference on Data Processing, Glen Burnie, MD, Society of Photo-optical Instrumentation Engineers, 1989, pp. 21–30.

Delete extraneous material such as the month the conference was held. Query the author for updated information—e.g., has the paper been published in a journal?

If the proceedings paper appears in a book or journal, treat it as a normal book or journal reference.

Be aware that some journals have the word *Proceedings* in their title. They are still treated as a normal journal.

15.2.4   Books

author, book title, publisher, city, state (in most cases), year

[ST] J. G. Sun and J. Y. Thomas, *The Matrix Eigenvalue Problem,* 2nd ed., The Johns Hopkins University Press, Baltimore, MD, 1989.

15.2.5   Books in Monographic Series

author, chapter title if applicable, "in" book title, abbreviated series title if provided, series volume if series title is provided, editor(s), publisher, city, state (in most cases), year, page numbers if chapter title is given

[18] P. Constantin, C. Foias, B. Nicolaenko, and R. Teman, *Integral Manifolds and Inertial Manifolds,* Appl. Math. Sci. 70, Springer-Verlag, New York, 1989.

[Hau] M. Hautus, *The formal Laplace transform for smooth linear systems,* in Mathematical Systems Theory, Lecture Notes in Econ. and Math. Systems 131, G. Marchesini and S. K. Mitter, eds., Springer, New York, 1975, pp. 29–47.

A monographic series is a collection of individually titled books published as volumes under an inclusive series name. Monographic series are marked with a dagger in *Abbreviations of Names of Serials.* **The book title is required.** Series information is optional; use it if it is supplied by the author but do not add it if not.

15.2.6   Theses

author, title, "Ph.D. thesis" (or other wording as supplied), university, location, year

[9] R. L. Pego, *Viscosities and Linearized Stability for Shock Profiles,* Ph.D. thesis, University of California, Berkeley, CA, 1972.

Stet variations such as *Ph.D. dissertation, Doctoral thesis,* and non-English terms. Query the author for updated information—e.g., has the thesis been published in a journal?

15.2.7   Unpublished Works: Reports, Preprints, Manuscripts

author, title, report or preprint number (if applicable), university or other institution, location, year

[10] J. B. Smith, *High Resolution Schemes,* Technical report 92-00, Institute for Computer Applications in Science and Engineering, Hampton, VA, 1992.

[11] T.-L. Tseng, *Compactly Supported Wavelets,* preprint, University of Pennsylvania, Philadelphia, 1992.

[Arn96] J. K. Arnold, *Iterative Methods in Numerical Analysis,* Preprint MIT425-890, Massachusetts Institute of Technology, Cambridge, MA, 1996.

[2] J. Birge, *Decomposition for Multistage Stochastic Linear Programs,* manuscript, 1997.

Query the author for update information—has the paper been published in a journal?

15.2.8   Private Communication

author, "private communication" (in italics), institution or organization (optional), location (optional), year

[16] M. Kojima, *private communication,* Tokyo Institute of Technology, Japan, 1995.

15.2.9   No Author

title, institution or organization, location, date

[12] *Sampling Specifications for the* 1990 *Survey of Voting and Registration Statistics,* Memorandum 2, Bureau of the Census, Washington, DC, March 20, 1992.

15.2.10   Translations

Used when the publication is originally in a foreign language but the reference provides the title in English.

[10] I. S. MOLCHANOV, *Random sets: A survey,* Ukr. Math. J., 43 (1991), pp. 1587–1599 (in Russian).

[GPR67] L. G. GURIN, B. T. POLYAK, AND E. V. RAIK, *The method of projections for finding a common point of convex sets,* Zh. Vychisl. Mat. i Mat. Fiz., 7 (1967), pp. 1211–1228 (in Russian); U.S.S.R. Comput. Math and Math Phys., 7 (1967), pp. 1–24 (in English).

15.3   Electronic Publications

15.3.1   Available Online Only

[13] E. M. PAGE, *A Brief Citation Guide for Internet Sources in History and the Humanities,* http://www.nmmc.com/ libweb/employee/citguide.htm (19 March 1996).

15.3.2   Available in Print and Online

[15] D. WOMBLE, D. GREENBERG, S. WHEAT, AND R. RIESEN, *Beyond core: Making parallel computer I/O practical,* in Proceedings of the 1993 DAGS/PC Symposium, Hanover, NH, June 1993, Dartmouth Institute for Advanced Graduate Studies, pp. 56–63; also available online from http://www.cs.sandia.gov/ dewombl/paralleldags93.html.

[1] E. ANDERSON, Z. BAI, C. BISCHOF, J. DEMMEL, J. DONGARRA, J. D. CROZ, A. GREENBAUM, S. HAMMARLING, A. MCKENNEY, S. OSTROUCHOV, AND D. SORENSEN, *LAPACK User's Guide,* SIAM, Philadelphia, PA, 2nd ed., 1994; also available online from http://www.netlib.org.

15.3.3   Available via FTP

[7] R. B. LEHOUCQ, D. C. SORENSEN, P. VU, AND C. YANG, *ARPACK: An Iimplementation of the Implicitly Restarted Arnoldi Iteration that Computes Some of the Eigenvalues and Eigenvectors of a Large Sparse Matrix,* 1995. Available via anonymous ftp from caam.rice.edu from the directory pub/people/sorensen/ARPACK.

15.3.4   CD-ROM

[3] A. G. ANDERSON, *Immersed interface methods for the compressible equations,* in Proceedings of the Eighth SIAM Conference on Parallel Processing for Scientific Computing, Minneapolis, MN, 1997, CD-ROM, SIAM, Philadelphia, PA, 1997.

Query the author for the print information (if available) for any online or electronic publication.

15.3.5   Online Repositories

Style as for manuscripts, with URL or other identifying code placed between title and year (if available).

[AG] A. GUILLOT, *The Geometry of Chazy's Third Order Homogeneous Differential Equations*, preprint, arXiv:1011.6090v1 [math.DS], 2010.

15.4   Editing References

References must contain information sufficient for a reader to find the referenced publication. With electronic linking of references to the publications themselves now possible, consistent styling of references is especially important.

15.4.1   Style

- Don't edit titles to match SIAM style. Do check for misspellings, however.

- Authors' first names always appear as initials only. There may be space between the initials or not—stet the author's format if consistent.

- Don't make author names consistent from one reference to the next. *P. L. Lions* in one reference and *P. Lions* in another is fine and likely is how the name appears in the publications.

- *Jr.* takes a comma on either side: B. B. KING, JR., AND L. HOPKINS.

- If the editors' names are given in the author name location at the beginning of the reference, use

  F. CLARKE AND M. CRANDALL, EDS.,....

  For editor information given within the reference, it is

  ...in And the Wind Cried Mary, J. Hendrix, ed., Harpercollins,....

- Note that there may be variations in the transliteration of names originally written in Cyrillic alphabets (Russian, Bulgarian, Serbian): ch, tsch, č; sh, š, ch; yu, ju, iu; skii, sky, skij; and so on. No particular style is more correct than another.

- Don't alphabetize references. However, if the list is alphabetized but for one or two references, move the errant references to the appropriate places.

- Look up every journal title in *Abbreviations of Names and Serials* and edit them to conform.

- Journal titles not listed in *Abbreviations of Names and Serials* need not be edited. However, do edit them as much as possible to the standards implied by *Abbreviations*: Journal becomes J., Engineering becomes Engrg., Applied becomes Appl., and so forth.

- Journal article titles are initial capped only, except for the word immediately following a colon, which is capped.

- "Stand-alone" titles—books, theses, reports, etc.—are capitalized headline style.

- Stet the capitalization of German and French titles of all types of publications.

- In all titles the first word following a colon is capped.

- The correct format for book editions is

  ... *Where the Sidewalk Ends,* 2nd ed., Harpercollins,...

- The correct format for book volumes is

  ... *Progressive Men of Western Colorado,* Vol. 3, Rocky Mountain Press...

- Make consistent all uses of a publisher's name within the references of a paper. For example, John Wiley *or* Wiley *or* John Wiley and Sons; Springer *or* Springer-Verlag.

- Delete such wording as *Publishers, Co., Inc.*

- Stet publisher locations (if correct); they need not be consistent within a paper.

- The correct format for submitted publications or publications to appear is

  ... *equations,* Oper. Res., submitted.

  ... *panda bears,* SIAM J. Numer. Anal., to appear.

Delete dates in these references if given.

15.4.2 Content

- Confirm the content of all references to SIAM publications.

- If a reference has a journal title, an article title is needed as well.

- Delete journal issue numbers unless each issue of a journal appears to start with page 1.

- Don't add states to well-known cities (Philadelphia, Los Angeles, Boston, Chicago, etc.) except to make all references within a paper consistent.

- Look up missing information such as publisher location and university location. U.S. and Canadian universities are listed in *Webster's Ninth,* pp. 1521–1535; publishers can be found on the Web and in *Books in Print* and *Ulrich's.*

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- Page numbers are necessary for journal articles and for chapters in books in which chapters are contributed by different authors. (In the latter case, presence of an editor name is a clue.)

- Questionable, odd, and confusing references may be clarified by checking MathSciNet (www.ams.org/mathscinet), Zentralblatt Math (www.emis.de: 80/ZMATH/en/zmath.html), and the Mathweb list of mathematics publishers (www.ams.org/index/mathweb/mi-publishers.html). However, don't style references to match the style used in these databases—apply SIAM style.

15.5   Citing References

- The author may cite references by name and number or by number alone.

  Facchinei and Lucidi [19] proved rate of convergence results.

  For recent convergence results, see [19].

  See Facchinei and Lucidi [19] for results.

- Use the same format for citations as that used in the references themselves.

  Facchinei and Lucidi [FL94] proved rate of convergence results.

  See Facchinei and Lucidi (1994) for results.

- Check the spelling of author names against the reference list. If there are inconsistencies, check reference resources such as MathSciNet; query the author if necessary.

- Use only the last names of authors in citations, unless the name is common or there are references by different authors with the same last name; in these cases add the authors' initials.

  See the analysis given by M. Wright [14].

  This was addressed by both E. Luo [24] and F.-E. Luo [25].

- Use et al. in citations with four or more authors.

- Reference citations may be enclosed individually in brackets (i.e., [2], [13]; [1], [2], [3]) or they may be grouped and bracketed (i.e., [2, 13]; [1, 2, 3]). Stet the author's setup if it's consistent.

- Do not use en-dashes to indicate a sequential range of references. (Citations are used as links to references in the online version of journals.)

  Correct: See, i.e., [5], [6], [7].

  Incorrect: See, i.e., [5–7].

- Ensure that each reference is cited within the text. Query the author if any are not cited. Do not delete any references that are not cited.

- Do not numerically order cited references in text. For example, stet "see, for example, [4, 2, 8, 6]."

- Change Jones, 1983 to Jones (1983). Add parentheses even if they end up nested.

  (cf. Jones (1983), (1984))

- Reference citations are nested within parentheses only if text is included.

  Correct: We use the embedding technique (see, for example, [3], [4], [7]).

  Incorrect: We use the embedding technique ([3], [4], [7]).

15.5.1   Citing Parts of a Reference

- Authors may cite page numbers, theorems, chapters, etc., from a reference. All information given by the author is used, but additional information normally is not requested. This information is listed in increasing order of specificity with page numbers given last.

  See Sepulchre (1983, Theorem 5, p. 6).

  See Hell [6, eq. (3.5)].

- The additional information may fall before the citation or within it but not after.

  Correct: See Theorem 2.4 of [16].

  Correct: See [16, Theorem 2.4].

  Incorrect: See [16], Theorem 2.4.

- If the author used [6, (3.11)], query whether (3.11) is an equation, theorem, etc.

- The items given in the reference cites may be abbreviated or spelled out. Use the author's style if consistent. The following abbreviations are used:

Appendix	App.	Formula	Form.
Chapter	Chap.	Lemma	Lem.
Corollary	Cor.	Proposition	Prop.
Definition	Def.	Remark	Rem.
equation	eq.	section	sect.
Example	Ex.	Theorem	Thm.
Figure	Fig.		
Page	p.	Pages	pp.

Note that *section* is lowercase. Note that although SIAM does not use the word *equation* preceding an equation number in text, we do use it in reference citations for clarity; it is lowercase.

15.5.2 Citation in the Abstract

Because abstracts must be able to stand alone, independent of the rest of the paper, standard reference citations cannot be used. Instead, replace citations with the reference itself, in brackets and formatted as follows.

Journal articles: [P. T. Boggs and J. W. Tolle, *SIAM J. Numer. Anal.*, 26 (1989), pp. 600–623]

Books: [R. Franke and E. Arnold, *The Curse of the Mummy,* K. Lev, ed., Birkhäuser, Basel, 1997]

Note that in journal references the article title is not used and the journal title is in italics. Note that book titles are in italics.

If the author refers by name to the authors of a cited work, you don't need to repeat the names within the reference.

Abstract. In this paper we give an analysis of a sequential quadratic programming algorithm by Boggs, Kearsley, and Tolle [*SIAM J. Optim.,* 9 (1999), pp. 755–778] for the solution of nonlinear large-scale problems.

Chapter 16

Querying the Author

"No query to an author should sound stupid, naive, or pedantic."[1]

16.1   Make the Change, or Query First?

The author need not be queried about basic changes to grammar, punctuation, and hyphenation. (What are "basic" changes? Fixing obvious subject-verb disagreement, inserting serial commas, hyphenating according to the rules on pp. 20–21 of this style manual.) Don't query about changes made in accordance with SIAM or standard mathematical style, such as changing the text of theorems to italic or marking functions to be roman.

Go ahead and make edits about which you are pretty confident—negotiating less-obvious subject-verb agreement, providing a verb where one is lacking but implied by context, clarifying a sentence by inserting punctuation—then query the author in the margin.

Query the author by e-mail or fax—before making any edits—about numbering problems, wording you can't make sense of, inconsistent use of terminology, ambiguous arrangement of text (subheads followed by subheads followed by further subheads with no clear pattern, e.g.), and anything else that could result in heavy corrections at later stages of production if left unresolved at copyediting.

A further challenge in the when-to-query debate is the situation in which a problem appears to be simple (will not result in heavy corrections at proofs) but you have no idea how to correct it. A common occurrence is an unclear antecedent—just what does the author's "it" refer to in this sentence? In this case, make no edits and write a query in the margin.

Queries answered at copyediting, before the paper goes to the comp for corrections, can save time and money. The other side of this coin is that queries made at this stage can be unclear or confusing to an author who does not yet have the proofs to refer to. An author is more likely to respond usefully and happily to "in situ" queries than to a long list of e-mailed queries that must refer to "section 4.1, third sentence before equation (4.4), beginning with 'In order to....'" Thus your good judgment is needed to determine what issues are important enough to require author clarification at copyediting and what can be left for the author to answer at proofs.

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[1] *The Chicago Manual of Style,* 14th ed., p. 83.

16.1.1 Queries that need an author response before copy-editing is turned in

- The author has numbered two equations as (2.1) and cited (2.1) throughout the paper. You've renumbered the equations but don't know how to fix the cites. (Query the author at copyediting whenever you've had to renumber items and the citation changes are at all ambiguous.)

- There may be font problems, e.g., extensive use of lightface roman variables.

- The author hasn't cited or referred to any of the figures.

- There are many undefined and uncommon acronyms or abbreviations.

- You have more than three queries for missing information or updates in the reference list, and you've checked MathSciNet and ZMATH.

- The author has acknowledged support from others in the body of the paper in such a way that moving it to the Acknowledgments section is awkward. You've reworded but aren't sure everything is where it should be.

16.1.2 Queries that can be left for the author to answer at proofs

- You've reformatted an expression to match the style used in the rest of the paper.

- You've added the spelled-out term for a common acronym or abbreviation.

- You've asked the author to cite some references in text if possible.

- You've renumbered the lemmas because there was no Lemma 3 and changed the text citations.

- The author didn't cite the figures by number but did refer to them another way ("...the following figure..."). You've added the figure numbers in the text.

- You've asked for missing information for two or three references.

16.2 Writing Queries

Conventionally, queries are written in the left margin; they are circled to distinguish them from editing marks that the comp is to implement. Highlight them, too.

Be specific. The author needs as much information as possible to evaluate the appropriateness of your change. If the author understands the logic behind your thinking he or she may be more likely to accept the change. A query such as "AUTHOR: OK to change to italics to match previous use? See page 2" gives the author much more information than simply "AUTHOR: OK?".

Consider that the author may not be fluent in English. Avoid abbreviations (*pls., t/o*) that could be meaningless to non-English speakers or those who are new to publishing their work.

E-mailed and faxed queries must include clear directions to the manuscript item in question. If you refer to page numbers, use those of the accepted copy, not the TEXed manuscript. Send e-mails and faxes to the corresponding author. If you receive no reply after a prompt and a reasonable waiting time, try another author, cc'ing the corresponding author in the case of e-mail. Keep copies of all your communications in the paper's folder.

Chapter 17

Acknowledgments

Acknowledgments appear just before References. They include statements of appreciation for helpful comments or supervision, thanks for programming or typing, or other similar information. Move any grant support information to the appropriate first-page footnote.

- The word is spelled *Acknowledgments*; check it in every paper.

- The head is *Acknowledgment* if only one acknowledgment is made.

- If the author has numbered the section, delete the number.

- The use of first person in Acknowledgments is fine; don't change it to third person. However, make the voice parallel.

  Correct: We thank A. Terhorst for interesting insight. We also thank M. Harpe for providing bag lunches to the researchers.

  Correct: The authors acknowledge J. Townsend and S. Lichtman for their assistance at The Courant Institute. The authors also thank Dawn Kujawa for pointing out an error in the proof of Lemma 1.

  Incorrect: The authors acknowledge the help of Dennis Staudinger and Adrian Hands. We also thank T. Setser for breakfast.

- Generally, preserve the author's wording.

- The use of titles, such as Dr. Iris Murdoch, is fine. Abbreviated titles are fine: Prof. Ferry.

Appendix A

Functions and Operators Commonly Set Roman

These functions and operators are set roman in roman and italic text; however, stet superscript and subscript italic functions and operators. Those preceded by an asterisk must be defined in the paper.

ad	adjoint
Ai	Airy function
Bi	secondary Airy function
	(Ci is third Airy function,
	Hi is seventh Airy function, etc.)
arg	argument
bd	bound
*ci	special cosine
cl	closure
coker	cokernel
const	constant
cos	cosine
csc	cosecant
cosh	hyperbolic cosine
cot	cotangent
coth	hyperbolic cotangent
*cs	special cosine
*cn	special cosine
*ctg	special cotangent
det	determinan
diag	diagonal
dim	dimension
div	divergent
exp	exponential
g.c.d.	greatest
GL	general linear

glb	greater lower bound
gr	group
grad	gradient
hom	homology
id	identity
Im	image or imaginary part
inf	inferior or infimum
int	interior or interval
ker, Ker	kernel, Kernel
Le	Lewis number
*lg	special logarithm
l.i.m.	limit in the mean
lim	limit
lim inf	limit inferior
lim sup	limit superior
*ln	logarithm
log	logarithm
Log	principle log
lub	least upper bound
max	maximum
min	minimum
mod	modulus
Null, null	Null space, null space
p	property
Prob/Pr	probability
pt	point
Range, range	Range, range
Rank, rank	Rank, rank
Re	real part (stet capital R)
	(*Re* is acceptable for Reynolds number)
sec	secant
sech	hyperbolic secant
*si	special sine
sinh	hyperbolic sine
SL	special linear
*sn	special sine
sp	spin
Sp	symplectic
sup	superior
supp	support
Sz(g)	Suzuki group
tan	tangent
tanh	hyperbolic tangent
tg	special tangent
*tn	special tangent
tr	trace
w	weak star
wr	wreath
Wr	Wronskian

Appendix B

Acronyms That Do Not Need To Be Spelled Out

ABC	Arnold–Beltrami–Childress (flow)
ABN	angle between normals
ADI	alternating-direction implicit
AIM	approximate inertial manifold
AND	automatic nested dissection
AOR	accelerated overrelaxation
ARE	algebraic Riccati equation
ART	algebraic reconstruction technique
BC	boundary conditions
BCG	biconjugate gradient
BEM	boundary element method
BEP	basic equivalent path
BEPS	Bramble–Ewing–Pasciak–Schatz
BFGS	Broyden–Fletcher–Goldfarb–Shanno
BHT	Brandt–Hackbusch–Ta'Assaan (method)
BIBS	bounded input bounded state
BICG	biconjugate gradient
Bi-CGSTAB	biconjugate gradient stabilized
BiStab	biconjugate stabilized
BLAS	basic linear algebra subprograms
BQP	bounded error quantum polynomial time
BVP	boundary value problem
CAL	Cray assembly language
CFD	computational fluid dynamics
CFL	Courant–Friedrichs–Lewy
CG	conjugate gradient
CGE	computable general equilibrium
CGN	conjugate gradient (applied to normal equations)
CGS	conjugate gradient squared
ch.f.	characteristic function
CLAM	computational linear algebra machine
CLT	central limit theorem
CMSSL	CM scientific subroutine library

CND	Cartesian nested dissection
CO	consistently ordered
cpdf	conditional probability density function
CPU	central processing unit
CPV	Cauchy principal value
CR	conjugate residual
CRT	Chinese remainder theory
CS	Cauchy–Schwarz
CS	conjugate symmetric
CSNE	corrected seminormal equation
CSTR	continuous flow stirred tank reactor
CT	computed tomography
CTLS	constrained total least squares
CUTE	constrained and unconstrained testing environment
CVD	chemical vapor deposition
DAE	differential algebraic equation
DAP	distributed array processor
DFP	Davidon–Fletcher–Powell
DFT	discrete Fourier transform
DHT	discrete Hartley transform
DI	differential inversion
DJAC	damped Jacobi
DMMP	distributed memory message passing
DOF	degree of freedom
DPVM	desingularized point vortex method
DSA	diffusion synthetic acceleration
DSYRK	subroutine (all caps)
DVBM	desingularized vortex blob method
EBE	element-by-element
ECHL	e constant h linear (m-modified)
EELAM	Eulerian Lagrangian localized
EIT	electrical impedance tomography
EJ	extrapolated Jacobi
ENO	essentially nonoscillatory
EOR	enhanced oil recovery
ESPRIT	estimation of signal parameters via rotational invariance techniques
FAC	fast adaptive composite
FCC	face-centered cubic
FCLT	functional central limit theorem
FDDI	filter distributed data interface
FFT	fast Fourier transform
FIFO	first in first out
flop	floating point operations
FMM	fast multipole method
FORM	first order reliability method
FPIR	fixed precision iterative refinement
FPU	floating point units
FRPI	full rank perturbed iteration
FSAL	first same as last
ftp	file transfer protocol
GAMS	general algebraic modeling system

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gcd	greatest common divisors
GCG	generalized conjugate gradient
GCO	generalized consistently ordered
GCR	generalized congruent residual
GCV	generalized cross validation
GDP	geometry defining processors
GEPP	Gaussian elimination with partial pivoting
GMRES	generalized minimal residual
GOLCP	generalized order linear complementarity problem
GPFA	generalized prime factor algorithm
GQRD	generalized QR decomposition
GSMP	generalized semi-Markov process
GSVD	generalized singular value decomposition
GTD	geometrical theory of diffraction
HJB	Hamilton–Jacobi–Bellman
HLCP	horizontal linear complementary problem
h.o.t.	higher order terms
HPD	Hermitian and positive definite
IBVP	initial boundary value problem
IEM	interaction-by-exchange-with-the-mean
ILU	incomplete LU factorization
ITEP	inverse Toeplitz eigenvalue problem
IVP	initial value problem
KAM	Kolmogorov–Arnold–Moser
KdV	Korteweg–deVries
KKT	Karush–Kuhn–Tucker
LBB	Ladyzhenskaya–Babuska–Brezzi
LBIC	laser beam induced current
LC	liquid crystal
LCP	linear complementarity problem
LICQ	linear independence constraint qualification
LMM	linear minimum-maximum
LMVM	limited memory variable metric
LOLIN	longest line next
LOP	local optimization procedure
LOT	lower-order terms
LPB	linear bilevel program
LPF	low-pass filter
LPW	worst case linear program
l.s.c	lower semicontinuous
LTR	loop transfer recovery
LU	(can't be spelled out; as in *LU decomposition*)
LUMR	locally uniform mesh requirements
MAC	marker and cell
MAP	maximum a posteriori
m.a.p.	minimal annihilating polynomial
MCGS	multicolored Gauss–Seidel
MDO	multidisciplinary design optimization
MDS	multilevel diagonal scaling
MFE	moving finite elements
MG	multigrid
MHD	magnetohydrodynamics

MIMD	multiple instruction multiple data
MIMO	multiple input multiple output
MLD	modified linear discontinuous
MMAE	methods of matched asymptotic expansions
MMD	multiple minimum degree
MOSFET	metal oxide semiconductor field effect transistors
MPLU	minimum phase LU
MSA	minimal surface area
MSOR	modified successive overrelaxation
MSTVD	modified singular truncated value decomposition
MTNS	mathematical theory of networks and systems
MVUL	minimum variance unbiased linear
NCR	nonhomogenous Cauchy–Riemann
NDR	negative differential resistance
NLNW	nonlinear network
NLPB	nonlinear program best case
NLPW	nonlinear program worst case
NMR	nuclear magnetic resonance
NP	(can't be spelled out; as in the expression *NP-hard*)
NSLS	nearly singular leading submatrix
OCP	order complementary problem
ODC	optimal design with composites
ODE	ordinary differential equation
OLC	optimal locally constrained
OSVD	ordinary singular value decomposition
PAM	projected aggregation methods
PAR	physical accounting record
PB	pulsed beam
PBF	primitive boundary function
PC	pressure correction
PCG	preconditioned conjugant gradient
PDE	partial differential equation
PDF	probability density function
PDL	polymer-dispersed liquid crystal
PDSD	primal dual steepest descent
PET	positron emission tomography
PGF	probability generating functions
PLL	phase-locked loop
PMF	probability mass function
PMR	preconditioned minimal residual
PPM	principal pivoting method
PR	preconditioned Richardson
PRAM	parallel random access machine
PSVD	product singular value decomposition
PTN	primal truncated Newton
p.u.	per unit
PVM	point vortex method
PW	worst case program
QHD	quantum hydrodynamic
QMR	quasi-minimal residual
QR	(can't be spelled out)

QRD	QR decomposition
QSVD	quotient singular value decomposition
RC	resistor capacitor
RCM	random choice method
RCP	reduced conjugation problem
RLC	resistor-inductor-capacitor
rmi	row minimal indices
RNAI	reduced node-arc incidence
RRQR	rank revealing QR
RSF	real Schur form
RSVD	restricted singular value decomposition
SAM	social accounting matrix
s.d.d.	scaled diagonally dominant
SDE	stochastic differential equation
SHS	self-propagating high-temperature synthesis
SI	successive interation
SIMD	single instruction multiple data
SIP	semi-infinite programming
SISO	single input single output
SLAP	straight line attainability property
SLEP	singular limit eigenvalue problem
SMCGS	symmetric variant conjugate gradient squared
SMFCQ	strict Mangasarian–Fromovitz constraint qualification
SNE	seminormal equation
SNI	seminormal equation
SOR	successive overrelaxation
s.p.d.	symmetric positive definite
SPMD	single program multiple data
SQP	sequential quadratic programming
SSC	steady-state combustion
SSIP	self sorting in place (computer)
SSOR	symmetric successive overrelaxation
SVD	singular value decomposition
TAM	Toeplitz approximation method
TFQMR	transpose-free quasi-minimal residual
TLS	total least squares
TPP	time periodic problem
TQR	truncated QR
TSVD	truncated value decomposition
TVD	total variation diminishing
ulp	unit in last place
URVD	URV decomposition
u.s.c.	upper semicontinuous
VBM	vortex blob method
VCO	voltage controlled oscillator
VLSI	very large scale integration
VP	virtual processor (ratio)
WKB	Wentzel–Kramers–Brillouin
WPM	weighted particle method
WT	wavelet transform
XLCP	extended linear complementary problem
YSMP	Yale sparse matrix package

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Appendix C

Common Abbreviations

Unless otherwise marked, all abbreviations are set roman in roman text and italic in italic text. Those preceded by an asterisk may be used without being spelled out on first appearance. The others are spelled out on first appearance with the abbreviation following in parentheses.

*a.a.	almost always
*a.e.	almost everywhere
*a.s.	almost surely
c.d.f.	cumulative distribution function
*cf.	compare
c.f.	characteristic function
dag	directed acyclic graph
*Db	decibel (abbreviation roman)
d.f.	distribution function
*e.g.	for example
*et al.	and others
g.l.b.	greatest lower bound
*i.e.	that is
*iff	if and only if
i.i.d.	independently and identically distributed
*KHz	Kilo Hertz (abbreviation roman)
L.H.S. (LHS)	left-hand side
l.i.m.	limit in the mean
l.u.b.	least upper bound
PABLO	parameterized block ordering
*pH, pK, pbK, pK	chemistry symbols (roman)
*PRAM	parallel random access memory
p.u.	per unit
*RAM	random access memory
r.e.	recursively enumerable
R.H.S. (RHS)	right-hand side

rms	root mean square
r.v.	random variable
s-lim	strong limit (roman)
s.t.	subject to or such that
u.a.r.	uniformly at random
var	variance (roman)
*viz.	namely
*w.r.t.	with respect to
w.p.l	with probability one
w.l.o.g.	without loss of generality
weak* topology	weak star topology

Appendix D

Publishers

Publishers may be located in cities other than those given here, and it is not necessary to add all of the locations given for a certain publisher. Other publishers may be found in *Books in Print* or via a search of the Internet. **Note that hyphens in publisher names are not changed to en-dashes.**

Academic Press	New York, San Diego, CA, London
Addison-Wesley	Reading, MA
Aegean Park Press	Laguna Hills, CA
Akadémiai Kiado	Budapest, Hungary
Alliant Computer Systems Corporation	Littleton, MA
Allyn and Bacon	Boston, MA
American Elsevier	New York
American Mathematical Society (AMS)	Providence, RI
Association for Computing Machinery (ACM)	New York
Balzer Scientific Publishers	Bussum, the Netherlands
W. A. Benjamin	New York
Birkhäuser Boston	Cambridge, MA
Birkhäuser-Verlag	Basel, Switzerland
Blackwell	Oxford
Blaisdell	New York, Waltham, MA
Brandon Systems Press	Princeton, NJ
Brooks/Cole	Pacific Grove, CA
Butterworth	London
Cambridge University Press	London, Cambridge
Chapman and Hall	London
Chelsea	New York
Clarendon Press	Oxford
Computer Science Press	Rockville, MD
CRC Press	Boca Raton, FL
Marcel Dekker	New York, Basel, Switzerland
Digital Press	Bedford, MA

Doubleday	New York
Dover	New York
Dunod	Paris
Ellis Norwood	Chichester, UK
Elsevier	New York
Elsevier–North Holland	Amsterdam
W. H. Freeman	San Francisco
Gauthier-Villars	Paris
Ginn	Boston
Gordon and Breach	New York
Griffin	London
Halsted (division of John Wiley)	New York
Harcourt Brace Jovanovich	Orlando, FL
Harcourt Brace and World	New York
Harper and Row	New York
Harren Press	Washington, DC
Heath	Boston
Helderman-Verlag	Berlin
Her Majesty's Stationery Office (HMSO)	London
Hermosa Press	Albuquerque, NM
Hermann	Paris
Adam Hiler	Bristol, UK
Holden-Day	San Francisco
Holt, Rinehart and Winston	New York
IEEE Press	Piscataway, NJ
Interscience (division of John Wiley)	New York, London
IRL Press	Oxford
JAI Press	Greenwich, CT
The Johns Hopkins University Press	Baltimore, MD
Kluwer Academic Publishers	Norwell, MA
Kluwer-Nijhof	Boston
Longman Press	London
Longman Scientific and Technical	Harlow, UK
Macmillan	New York
Martinus Nijhof	Dordrecht, the Netherlands, Boston
Maruzen	Tokyo
Masson	Paris
McGraw-Hill	New York, Toronto, London
Methuen	London
MIT Press	Cambridge, MA
Nauka	Moscow
(Thomas) Nelson	London
P. Noordhoff	Groningen, the Netherlands
North-Holland	Amsterdam
North Oxford Academic Publishing	Oxford
Oliver and Boyd	London
Oxford University Press	Oxford, London
Pergamon Press	Elmsford, NY, Oxford
Pitman	Boston

Plenum Press	New York
Prentice-Hall	Englewood Cliffs, NJ, Upper Saddle River, NJ
Princeton University Press	Princeton, NJ
Pruett Press	Boulder, CO
Rand McNally	Chicago
D. Reidel	Boston, Dordrecht, the Netherlands
Reinhold	New York
W. B. Saunders	Philadelphia
Scott, Foresman	Glenview, IL
Sijthoff & Noordhoff	Groningen, the Netherlands
Springer-Verlag	Berlin, New York, Heidelberg
Teubner	Leipzig, Stuttgart
University of Alabama Huntsville Press (UAH Press)	Huntsville, AL
University of California Press	Berkeley, CA
University of Wisconsin Press	Madison, WI
Frederick Ungar	New York
Van Nostrand	New York, Princeton
Wellesley–Cambridge Press	Wellesley, MA
John Wiley	New York, London, Sydney
Wiley-Interscience	New York
World Scientific	River Edge, NJ
Yale University Press	New Haven, CT

Appendix E

Mathematicians

Abel (Abelian; stet lowercase if consistent)
Ackermann
Arrhenius
Arzelà
Ascoli
Babuska
Banach
Bayes
Bénard
Bernoulli
Bessel
Bézout
Bhattacharya
Birkhoff
Blaschke
Bohr
Bochner
Boltzmann
Boole (Boolean; stet lowercase if consistent)
Borel
Boussinesq
Brown (Brownian)
Burgers (Burgers's equation, but the Burgers equation)
Carathéodory
Cauchy
Cauchy–Schwarz
Cayley
Casàro
Chandrasekhar
Chapman (Chapman–Jouguet)
Chebyshev (sometimes Tschebycheff in reference to T-systems; change Tchebyshev to Chebyshev)
Cholesky (Choleski)
Christoffel
Clairaut
Clapeyron

Clausius (Clausius–Clapeyron)
Cotes
Couette
Coulomb
Courant
Courdesses
Cramer (Cramer's rule)
Cramér (H. Cramér/Rao)
Crank (Crank–Nicolson)
d'Alembert
Damköhler
Darboux
de Boor
De Bruijn
de Bruin
Dedekind
de Graaf
de Vries
De Moivre
De Morgan
Debye
Delves
Descartes (Cartesian)
Dini
Dirichlet
Erdélyi
Erdös
Erlang
Euclid (Euclidean; stet lowercase if consistent)
Euler (pronounced "oiler"; preceded by "an" not "a")
Faber (Faber–Padé)
Fatou
Fejér
Fermat
Fibonacci
Filippov
Fitzhugh (Fitzhugh–Nagumo)
Fokker (Fokker–Planck)
Fourier
Fréchet
Fredholm
Frobenius
Fubini
Galerkin
Galois
Gâteaux
Gauss (Gauss–Seidel)
Gel'fand (Gel'fand–Levitan)
Gödel
Godunov
Goertzel

Gordon (sine-Gordon)
Grassmann
Gronwall
Hadamard
Hahn (Hahn–Banach)
Hamilton (Hamiltonian)
Hankel
Hausdorff
Heaviside
Helmholtz
Herglotz
Hermite (Hermitian; stet lowercase if consistent)
Hesse (Hessian; stet lowercase if consistent)
Hilbert
Hölder
Holmgren
Hopf
Hugoniot
Huygens (Huyghens)
Ito (Itô, Itō)
Jacobi (Jacobian)
Jouguet
Joule
Kepler
Khinchine
Kirchhoff
Klein (Klein–Gordon)
Kolmogorov
Korteweg (Korteweg–de Vries)
Kronecker
Krylov
Kuhn–Tucker
Kutta
l'Hôpital
Ladyzhenskaya
Lagrange (Lagrangian)
Laguerre
Lamé
Langmuir
Laplace
Laurent
Lebesgue
Lefschetz
Legendre
Leibniz
Levitan
Lévy
Lie
Liouville
Lipschitz (Lifshits for TVP)
Liptser

Lovàsz
Lyapunov (Liapunov)
Maclaurin
Markov (Markovian)
Mattheij
Mathieu
Megiddo
Meijer
Minkowski
Möbius (Moebius)
Nagumo (Fitzhugh–Nagumo)
Napier
Navier (Navier–Stokes)
Neumann
Newton (Newton–Raphson)
Nicolson
Nikodým
Nordsieck
Obreshkov
Odlyzko
Padé
Parseval
Pascal
Perron
Picard
Planck
Poincaré
Poiseuille
Poisson
Pólya
Pontryagin
Poussin
Prandtl
Prufer
Radon
Raphson
Rayleigh (Rayleigh–Ritz)
Reade
Reinsch
Riccati
Richtmyer
Riemann (Riemannian)
Riesz
Ritz
Rodrigues
Rolle
Runge (Runge–Kutta)
Schlicht
Schrödinger (Schroedinger)
Schur
Schwarz (Schwarz–Christoffel, Cauchy-Schwarz)

Schwartz
Shilov
Siegel
Stefan
Steinitz
Stieltjes
Stifel
Stokes
Student
Sturm (Sturm–Liouville)
Sussmann
Szegö
Tikhonov
Toeplitz
Tukey
van der Pol
van der Waals
van der Waarden (Waerden)
Vandermonde
Vlasov (Vlasov–Poisson)
Volterra
Von Koch
von Neumann
Voronoi
Wessel
Weierstrass (Weierstrass approximation)
Weiner
Weyl
Wiener
Wronski

Appendix F

Societies, Institutes, Government Agencies

AAAS	American Association for the Advancement of Science
AAUP	American Society of University Presses
ACM	Association for Computing Machinery
ACSyAM	Army Center of Excellence for Symbolic Methods in Algorithmic Mathematics
AERE	Atomic Energy Research Establishment (Harwell, U.K.)
AFOSR	Air Force Office of Scientific Research
AIAA	American Institute of Aeronautics and Astronautics
AMS	American Mathematical Society
ARO	Army Research Office
ASA	American Statistical Association
ASME	American Society of Mechanical Engineers
CBMS	Conference Board of the Mathematical Sciences
CEA	Centre d'Etudes Atomique
CEREMADE	Centre de la Recherche de Mathématiques de la Décision
CERFACS	Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique
CESSE	Council of Engineering and Scientific Society Executives
CNES	Centre National d'Etudes Spatiales
CNPq	Conselbo Nacional de Desenvolvimento Cientifico e Technológico
CNR	Consiglio Nazionale delle Ricerche
CNRS	Centre National de la Recherche Scientifique (Paris)
CNSERC	Canadian Natural Sciences and Engineering Research Council
CONACYT	Consejo Nacional de Ciencia y Tecnología
CRAS	Comtes Rendus Acad. Scientifique
CWI	Centrum voor Wiskunde en Informatica
DAE	Department of Energy
DARPA	Defense Advanced Research Projects Agency
DFG	Deutsche Forschunsgemeinschaft
DGICYT	Dirección General de Investigacíon Cientifica y Tecnológica
DIMACS	Center for Discrete Mathematics and Theoretical Computer Sciences
DOD	Department of Defense
DOE	Department of Energy

ENSIEG	Ecole Nationale Superieure d'Ingénieurs Electriciens de Grenoble
ENSTA	Ecole Nationale Superieure de Techniques Avancées
ENSM	Ecole Nationale Superieure de Mécanique
EPA	Environmental Protection Agency
ESA	European Space Agency
U.S. ERDA	U.S. Energy Research and Development Administration
ESPRIT	European Strategic Programme for Research and Development in Information Technology
ESAT	Electronics, Systems, Automation, and Technology
ETH	Eidgenössische Technische Hochschule
E.T.S.I.	Escuela Técnica Superior de Ingenerias
FAEP– UNICAMP	Fundação de Amparo à Pesquisa da Universidade de Campinas
FAPESP	Fundação de Amparo à Pesquisa da Estado de São Paulo
FCAR	Formation de chercheurs et action de recherche, Québec
FCEYN	Facultad de Ciencias Exactas y Naturales
FNRS	Fonds national de la recherche scientifique
FSA	Fuzzy Systems Association
GAES	German Academic Exchange Service
GNAFA	Gruppo Nazionales per L'Analisi Funzionala ed Applicazione
IAN	Istituto di Analisi Numerica–CNR
ICALP	International Collegium on Automata, Languages, and Programming
ICASE	Institute for Computer Applications in Science and Engineering
ICOMP	Institute for Computational Mechanics in Propulsion
IEE	Institution of Electrical Engineers
IEEE	Institute for Electrical and Electronics Engineers (Inc.)
IEI	Istituto de Elaborazione dela Informazione
IFAC	International Federation of Automatic Control
IFIPS	International Federation of Information Processing Societies
IIASA	International Institute of Applied Systems Analysis
IMACS	International Association for Mathematics and Computers in Simulation
IMA	Institute for Mathematics and Its Applications
IMS	Institute of Mathematical Sciences
IMSL	International Mathematics and Statistical Libraries
INPE	Institute de Pesquisas Especials (Brazil)
INRIA	(changed from IRIA) Institut National de Recherche en Informatique et en Automatique
INSAI	Institut National des Sciences Appliquées
IPN	Instituto Politécnico Nacional
IRIA	Institut de Recherche d'Informatique et d'Automatique
IRISA	Institute de Recherche en Informatique et Systèmes Aleatoires
ISI	Institute for Scientific Information
IST	Innovative Science and Technology
JPL	Jet Propulsion Laboratory
LAGEP	Laboratoire d'automatique et de génie des procédés
LOMI	Leningrad Otdel Math. Inst. Steklov
MAA	Mathematical Association of America
MICRO	State of California Microelectronics Innovation and Computer Research Opportunities
MPI	Ministero della Pubblica Istruzione
MESS	Ministère education superieure et sciences

MRC	Mathematics Research Center (University of Wisconsin)
NAG	Numerical Algorithms Group
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Administration
NBS	National Bureau of Standards
NCAR	National Center for Atmospheric Research
NCCS	NASA Center for Computational Sciences
NCGA	National Computer Graphics Association
NCSA	National Center for Supercomputing Applications
NCTM	National Council of Teachers of Mathematics
NERSC	National Energy Research Supercomputing Center
NFR	Swedish Natural Research Council
N.F.W.O.	Belgian National Fund of Scientific Research
NIH	National Institutes of Health
NOAA	National Oceanographic and Atmospheric Administration
NRC	National Research Council
NSA	National Security Agency
NSERC	Natural Sciences and Engineering Research Council of Canada (same as CNSERC)
NSF	National Science Foundation
NWO	Netherlands Organization for Scientific Research
ONR	Office of Naval Research
ORNL	Oak Ridge National Laboratory
ORSA	Operations Research Society of America
PRU	Programme de Recherche Universitaire du Ministère Canadien de la Defense
RAIRO	Revue Française Automatique Informatique Recherche Operationelle
RIACS	Research Institute for Advanced Computer Science
SERC	Science and Engineering Research Council of Canada
SDIO	Strategic Defense Initiative Organization
SIMS	SIAM Institute for Mathematics and Society
SPIE	Society of Photo-Optical Instrumentation Engineers
SRC	Semiconductor Research Council
SSP	Society for Scholarly Publishing
STU	Swedish Board for Technical Development
UNAM	Universidad Nacional Autónoma de México
UNICAMP	University of (or Universidade de) Campinas
URA	Unité de Recherche Associée
URI	University Research Institute
USAEC	United States Atomic Energy Commission
U.S. ERDA	U.S. Energy Research and Development Administration
USRA	Universities Space Research Association