IEEE Editorial Style Manual


IEEE Transactions Editing Philosophy

The IEEE’s responsibility in editing papers for the Transactions is not to make any determination on or do any editing of the technical content of the papers we work with, but instead to render the work as readable, grammatically correct, and as consistent with IEEE style as possible.

Since we are concerned with style mainly in the sense of IEEE house style, we do not try to change an author’s style of writing. We do a mechanical edit to correct or question grammatical errors, obvious inconsistencies or omissions, spelling, and punctuation. Since we work with highly technical text, we also do extensive formatting of mathematical material.

Parts of a Paper

Paper Title

In the paper title, capitalize the first letter of the first and last word and all the nouns, pronouns, adjectives, verbs, adverbs, and subordinating conjunctions (If, Because, That, Which). Capitalize abbreviations that are otherwise lowercase (e.g., use DC, not dc or Dc) except for unit abbreviations and acronyms. Articles (a, an, the), coordinating conjunctions (and, but, for, or, nor), and most short prepositions are lowercase unless they are the first or last word. Prepositions of more than three letters (Before, Through, With, Without, Versus, Among, Under, Between) should be capitalized.

First Footnote

The first footnote is made up of three paragraphs. This footnote is not numbered. All other footnotes in the paper are numbered consecutively. The first paragraph contains the received and (possibly) revised dates of the paper. When a paper has more than one revised date, list all the dates given. The second paragraph is made up of the authors’ affiliations. For two or more authors with different affiliations, use separate sentences and paragraphs for each, using all initials with a surname. Group the authors with the same affiliation together; list the affiliations according to the order of the authors in the byline. The third or final paragraph lists the Digital Object Identifier (DOI) number, assigned by the IEEE. All financial support for the work in the paper is listed next to the first paragraph and not in the Acknowledgment at the end of the paper.

Body of a Paper

Abstract

Every published paper must contain an Abstract. Abstracts appear in text in boldface type. By nature, Abstracts shall not contain numbered mathematical equations or numbered references.

Index Terms

All papers must contain Index Terms as provided by the authors. A list of keywords is available by sending a blank email to keywords@ieee.org. Index Terms appear in boldface type as in the Abstract, in alphabetical order, and as a final paragraph of the Abstract. Acronyms are defined in Index Terms if they are defined in the paper.

Nomenclature

Nomenclature lists (lists of symbols and definitions) generally follow the Abstract and Index terms and precede the Introduction.
**Text Section Headings**

Standard specifications have been established for Transactions text section headings. There are four levels of section headings with established specifications: primary; secondary; tertiary; and quaternary heads.

Enumeration of section heads is desirable, but not required. The author’s preference may be followed. However, the choice must be consistent throughout the paper.

Primary headings are enumerated by Roman numerals and centered above the text.

Secondary headings are enumerated by capital letters followed by periods, flush left, upper and lower case, and italic.

Tertiary headings are enumerated by Arabic numerals followed by parentheses. They are indented one em, and run into the text in their sections, italic, upper and lower case, and followed by a colon.

Quaternary headings are identical to tertiary headings, except that they are indented two ems, lower case letters are used as labels, and only the first letter of the heading is capitalized.

Reference and Acknowledgment headings are unlike all other section headings in text. They are never enumerated. They are simply primary headings without labels, regardless of whether the other headings in the papers are enumerated.

Appendix headings are a special case. The primary heading(s) in the Appendix or Appendixes (note spelling of plural) are set according to the usual style, except that there is flexibility in the enumeration of the heading. The author may use Roman numerals as heading numbers (Appendix I) or letters (Appendix A). The Appendix heading is not preceded by a Roman numeral. If there is only one Appendix in the paper, the Appendix heading is unnumbered and unnamed.

**Text Equations**

Equations within a paper are numbered consecutively from the beginning of the paper to the end. There are some Transactions in which the author’s own numbering system, such as numbering by section, e.g., (1.1), (1.2.1), (A1), is permitted.

**Acknowledgment**

The placement of the Acknowledgement appears after the final text of the paper, just before the References section, and after any Appendix(es).

When citing names within the Acknowledgment, use first initials only, not full names. Do not use Mr., Mrs., Ms., or Miss (list first initial and last name only). Use the Dr. or Prof. title with each name separately; do not use plural Drs. or Profs. with lists of names.

All acknowledgment of financial support must be removed from the Acknowledgment section, and placed in the first paragraph of the first footnote.

Write the Acknowledgment section to be read in the third person.

**References**

The numbering of references is employed by citing one reference per number. Every reference in a Transactions reference list should be a separate number entry. Use of one reference number to designate a group of references is not allowed.

**Text Citation of Figures and Tables**

All citations of figure and tables in text must be in numerical order. Citations to figures in text always carry the abbreviation “Fig.” followed by the figure number. The abbreviation is used even when it begins a sentence.

**Biographies**

IEEE Transactions’ author biographies are generally divided into three paragraphs.

The first paragraph begins with the author’s full name and IEEE membership history. If provided by the author, the first paragraph may contain a place and/or the date of birth. Next, the author’s educational background is listed. Use lower case for the author’s major field of study. Always use the word “degree” after a degree title. Include the years the degrees were received. Abbreviations for common international and domestic degrees are:


The second paragraph should list work and military experience, including summer and fellow jobs and consultant positions. Job titles are capitalized. The current job must have a location. Previous positions may be listed without a location. List author affiliations with non-IEEE journals. List the author’s current and previous fields of interest. Do not repeat the author’s name in the second paragraph; use “he” or “she”.

The third paragraph begins with the author’s title and last name (e.g., Dr. Smith, Prof. Jones, Mr. Hunter, Ms. Taylor). It lists the author’s membership in professional societies other than IEEE and his or her status as a
Professional Engineer. Finally, list awards and work for IEEE committees and publications. Personal notes such as hobbies are excluded.

If no photograph is available or the Transactions does not require them, the biography is set across one column.

If no biography is available, a squib is used. For example:

*James A. Author (S′xx—M′xx)*, photograph and biography not available at time of publication.

**Other Text**

**Footnotes**

Footnotes should be numbered in consecutive order throughout the text. The footnote numbers are superscripts in text and in the actual footnotes. In text, place the superscript footnote numbers after the punctuation such as periods, commas, and parentheses, but before colons, dashes, quotation marks, and semicolons in a compound sentence. The footnotes should be placed at the bottom of the text column in which they are cited.

**List in Text**

The ordering of labeling for all lists is 1), 2), 3) followed by a), b), c), and then i), ii), iii).

An example of a *run-in list* is as follows.

The carrier—phonon interaction matrices are given by: 1) polar optical phonons; 2) deformation potential optical phonons; and 3) piezoelectric acoustic phonons.

**Other Types of Papers**

*Brief Papers* are set up as full-length papers, except that the paper title is set in 16-point typeface. These papers do contain Abstracts, but do not contain biographies and photographs of the authors.

*Short Papers, Correspondences, and Communications* are set up like full-length papers, except that usually they are 9-point typeface. These papers do contain Abstracts, but do not contain biographies and photographs of the authors.

*Comments and Replies* are generally published together in that the “Author’s Reply” is in response to the Comments. The “Comments” is in response to a previously published paper. These short items may appear with or without an Abstract. Begin the first sentence with, “In the above paper [1], …” The reference, the commented paper’s citation, is the first reference in the References section of the Comments.

*Obituaries/In Memoriam* may carry a photo of the person being memorialized. The name of the person appears above the photograph. The photograph is generally centered above the text. The years of birth and death are generally cited at the bottom of the photo within parentheses.

**Editorial Style for Transactions**

The following provides a summary of the most important style distinctions to be made in the final copy of a Transactions paper.

**Acronyms**

Define acronyms the first time they appear in the Abstract as well as the first time they appear in the body of the paper, written out as part of the sentence, followed by the acronym in parentheses. If the acronym is not repeated in the Abstract, do not include the acronym in parentheses. Coined plurals or plurals of acronyms do not take the apostrophe (e.g., FETs). Possessive forms of the acronym do take the apostrophe (e.g., CPU’s speed).

Indefinite articles are assigned to abbreviations to fit the sound of the first letter (e.g., an FCC regulation; a BRI).

**Trademarks**

The trademark symbol, TM, C, R, is not used. Capitalize the first letter in the trademark only.

**Plurals**

Plurals of units of measure usually do not take the “s”. For example, the plural form of 3 mil is 3 mil, but 3 bits/s instead of 3 bit/s. Plural forms of calendar years do not take the apostrophe (e.g., 1990s). To avoid confusion, plural forms of variables in math do take the apostrophe (e.g., x’s).
The En, Em, or Two-Em Dash

The en dash represents the words “to,” “through,” or “and.” Use it between page numbers (e.g., pp. 5–10), reference numbers (e.g., [5]–[10]), figure citations, (e.g., Figs. 2–4), academic years (e.g., 1996–1999), proper nouns (Bose–Einstein theory), a range of values (e.g., 10–20 cm), or for opposites (e.g., in–out). Also use the en dash in chemical abbreviations such as Ni–Al–Si. When using the en dash to represent a range, if the word “from” is used, the word “to” must be used rather than an en dash (e.g., from 5 to 50 times). The em dash is used to highlight a parenthetical phrase in a sentence (e.g., “An FIB modifies a surface by sputtering with energetic ions—usually Ga for technical reasons—in a beam with half-width of the order of 10 nm.”).

Math

1) Variables are set in italic; vectors and matrices are usually boldface italic.
2) Remove commas around variables in text.
3) Always add a zero before decimals, but do not add after (e.g., 0.25).
4) Spell out units in text without quantities (e.g., where the noise is given in decibels).
5) Numbers and units used as compound adjectives should be hyphenated only if needed for clarity (e.g., 10-kV voltage; 5-in-thick glass).
6) Use thin spaces (instead of a comma) between numbers in tens or hundreds of thousands (e.g., 60 000, 100 000, but 4000).
7) Use zeroth, first, nth, (k+1)th, not 0th, 1st, 2nd, 99th, nth, (k + 1)st.
8) Use the word “equation” at the start of a sentence only, but in text just use the number [e.g., in (1)], unless describing an equation, e.g., see “Darlington equation (1).”
9) The slash is used in place of the word “per” when it leads to the clarity of the sentence (e.g., the ratio of 16 samples/s to 35 samples/s as compared to...).
10) Use “indices” instead of “indexes” when referring to subscripts.
11) Plural variables have an “’s”.

Ellipses

Ellipses may be used to show continuation in an expression (e.g., $x_2, \ldots, x_{16}$). The type of mathematical expression will determine whether the ellipses are on the baseline or centered.

Conditions

In displayed equations, there should be a comma or parentheses and a two-em space between the main expression and the condition following it. For example,

$$X=yn^{-2}, \quad \text{for all } n=3$$

$$X=yn^{-2}, \quad Vn=3$$

$$X=yn^{-2}, \quad \text{if } n=3, y^{-4}$$

$$X=yn^{-2}, \quad y3, \ldots, m$$

NOTE: There is no comma before a “for all” (V) symbol.

Compound Units

Compound units should be separated by a multidot (e.g., 4 V·s). Parentheses may be used to clarify a unit: g/(cm·s) or g·cm⁻¹·s⁻¹.

Use of Period and Commas

Equations that conclude a sentence should end with a period. The only time punctuation is used to lead into an equation when the lead-in text is a complete sentence. Example:

where we had the following:

$$x=Y+Z.$$

or, where, i.e.,

$$x=Y+Z.$$
Displayed Equations

Certain types of material in displayed equations are automatically italic. Some simple general rules apply. All variables are italic. (e.g., \(x, y, n\)). Function names and abbreviations are Roman (\(\sin, \cos, \text{sinc}, \sinh\)), as are units or unit abbreviations (e.g., \(\text{deg}, \text{Hz}\)), complete words (e.g., \(\text{in}, \text{out}\)), and abbreviations of words (e.g., \(\text{max}, \text{min}\)), or acronyms (e.g., \(\text{SNR}\)). Single letter superscripts and subscripts may be italic even if they are abbreviations, unless this leads to inconsistency between italic and roman characters for similar types of subscripts.

Rules of Grammar

The principles of style given below aim to concentrate on the fundamentals of modern usage. Particular emphasis is given to the rules most commonly violated.

1) Form the possessive singular of nouns by adding ‘s.
2) In a series of three or more terms, use a comma after each term except the last.
3) Enclose parenthetic expressions between commas.
4) Use the semicolon, not the comma, to separate two complete sentences which form a compound sentence.
5) Use a colon after an independent clause to introduce a list.
6) Punctuation always goes inside the quotation mark, except for the colon and semicolon.
7) Do not use double parentheses in text expression, but keep them in math.
8) All acronyms and numerical plurals do not use apostrophes.
9) Compound nouns made from a one-syllable verb and a short adverb are one word when found that way in the dictionary.
10) A pair of words, modifying a third word separately, does not get a hyphen.
11) A hyphen is not used after the comparative or the superlative.
12) Do not use commas between adjectives.
13) Do not hyphenate predicate adjectives.
14) Compound verbs are generally hyphenated.

EDITING REFERENCES

A. Citing References

References in Text: References need not be cited in the text. When they are, they appear on the line, in square brackets, inside the quotation. Grammatically, they may be treated as if they were footnote numbers, e.g.,

as shown by Brown [4], [5]; as mentioned earlier [2], [4]–[7], [9]; Smith [4] and Brown and Jones [5]; Wood et al. [7]

NOTE: Use et al. when three or more names are given.

or as nouns:

as demonstrated in [3]; according to [4] and [6]–[9].

References Within a Reference: Check the reference list for \(\text{ibid.}\) or \(\text{op. cit.}\). These refer to a previous reference and should be eliminated from the reference section. In text, repeat the earlier reference number and renumber the reference section accordingly. If the \(\text{ibid.}\) gives a new page number, or other information, use the following forms:

[3, Th. 1]; [3, Lemma 2]; [3, pp. 5-10]; [3, eq. (2)]; [3, Fig. 1]; [3, Appendix I]; [3, Sec. 4.5]; [3, Ch. 2, pp. 5-10]; [3, Algorithm 5].

NOTE: Editing of references may entail careful renumbering of references, as well as the citations in text.

B. Style

Reference numbers are set flush left and form a column of their own, hanging out beyond the body of the reference. The reference numbers are on the line, enclosed in square brackets. In all references, the given name of the author or editor is abbreviated to the initial only and precedes the last name. Use commas around Jr., Sr., and III in names. If there
are many names, use them all; use *et al.* only if names are not given. Note that when citing IEEE Transactions, if the month is not available, the number may be kept, although it is normally deleted. Keep the day of the month when referencing a patent. References may not include all information; please obtain and include relevant information. Do not combine references. There must be only one reference with each number. If there is a URL included with the print reference, it can be included at the end of the reference.

**Periodicals**

Prior to 1988, the volume number of IEEE Transactions/Journals carried the acronym of the journal. For example, an issue of the IEEE TRANSACTIONS ON AUTOMATIC CONTROL would read: *IEEE Trans. Automat. Contr.*, vol. AC-26, pp. 1–34, Jan. 1981. When referencing IEEE Transactions, the issue number should be deleted and month carried.

**NOTE:** The only exception to this rule is PROCEEDINGS OF THE IEEE, which never carried an acronym on the masthead.

**Basic Format:**


**Examples:**


[8] E. H. Miller, “A note on reflector arrays,” *IEEE Trans. Antennas Propag.*, to be published.*** Always use this style when the paper has been accepted or scheduled for a future publication, i.e., do not use “to appear in.”***

[9] C. K. Kim, “Effect of gamma rays on plasma,” submitted for publication. ***Always use this style when the paper has not yet been accepted or scheduled for publication, i.e., do not use “to appear in.”***


**Article Referred to in the Same Issue:**


**NOTE:** Handle it exactly as you would any other reference.
Books

Basic Format:

Examples:

Reports

The general form for citing technical reports is to place the name and location of the company or institution after the author and title and to give the report number and date at the end of the reference.

Basic Format:

Examples:

Handbooks

Basic Format:

Examples:
Published Conference Proceedings

The general form for citing conference proceedings is to list the author and title of the paper, followed by the name (and location, if given) of the conference in italics using these standard abbreviations.

Annals
Annual
Colloquium
Conference
Congress
Convention
Digest
Exposition
International
Meeting
National
Proceedings
Record
Symposium
Technical Digest
Technical Paper
Workshop
Ann.
Annu.
Colloq.
Conf.
Congr.
Conv.
Dig.
Expo.
Int.
Meeting
Nat.
Proc.
Rec.
Symp.
Tech. Dig.
Tech. Paper
Workshop

First
Second
Third
Fourth/nth...
1st
2nd
3rd
4th/nth...

Write out all the remaining words, but omit most articles and prepositions like “of the” and “on.” That is, *Proceedings of the 1996 Robotics and Automation Conference* becomes *Proc. 1996 Robotics and Automation Conf.*

**NOTE:** All published conference or proceedings papers have page numbers.
Basic Format:


Examples:


Papers Presented at Conferences

Basic Format:


Examples:


Patents

Basic Format:


Example:


NOTE: Use “issued date” if several dates are given.

Theses (M.S.) and Dissertations (Ph.D.)

Basic Format:


Examples:


Unpublished

These are the two most common types of unpublished references.

Basic Format:


Examples:


Standards

Basic Format:

[1] Title of Standard, Standard number, date.

Examples:


C. On-Line Sources

The guidelines for citing electronic information as offered here are in modified illustration of the adaptation by the International Standards Organization (ISO) documentation system and the American Psychological Association style.

Books, Monographs

Basic Format:


Example:


FTP

Basic Format:


Example:


WWW

Basic Format:


Example:


E-Mail

Basic Format:

[1] J. K. Author. (year, month day). Title (edition) [Type of medium]. Available e-mail: Message:

Example:


Telnet

Basic Format:

Example:


Full Text Databases—Periodicals

Journal Articles

Basic Format:


Examples:


FTP

Basic Format:


Example:


WWW

Basic Format:


Example:


E-Mail

Basic Format:


Example:


Telnet

Basic Format:


Example:

Magazine Articles

Basic Format:


Example:


FTP

Basic Format:


Example:


WWW

Basic Format:


Examples:


E-Mail

Basic Format:

[1] J. K. Author. (year, month day). Title. Magazine [Type of medium]. paging if given. Available e-mail: Message:

Example:


Telnet

Basic Format:


Example:


Full Text Databases—Other Sources

Papers Presented at Conferences

Basic Format:


Example:

Reports and Handbooks
Basic Format:


Examples:


U.S. Government Documents
Basic Format:

[1] Legislative body. Number of Congress, Session. (year, month day). Number of bill or resolution, Title. [Type of medium]. Available: site/path/file

Example:


Patents
Basic Format:

[1] Name of the invention, by inventor’s name. (year, month day). Patent Number [Type of medium]. Available: site/path/file

Example:


Common Abbreviations of Words Used in References

Acoustics Acoust.
Administration Admin.
Administrative Administ.
American Amer.
Analysis Anal.
Annals Ann.
Annual Annu.
Apparatus App.
Applications Applicat.
Applied Appl.
Association Assoc.
Automatic Automat.
Broadcasting Broadcast.
Business Bus.
Communications Commun.
Computer(s) Comput.
Congress Congr.
Convention Conv.
Correspondence Corresp.
Cybernetics Cybern.
Department Dept.
Development Develop.
Digest Dig.
Economic(s) Econ.
Education Educ.
Electrical Elect.
Electronic Electron.
Engineering Eng.
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**List of IEEE Transactions, Journals, and Letters**

IEEE Transactions on Aerospace and Electronic Systems
IEEE Transactions on Antennas and Propagation
IEEE Antennas and Wireless Propagation Letters
IEEE Transactions on Applied Superconductivity
IEEE Transactions on Audio Electroacoustics
IEEE Transactions on Automatic Control
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Biomedical Circuits and Systems
IEEE Transactions on Broadcasting
IEEE Transactions on Circuits and Systems—I: Regular Papers
IEEE Transactions on Circuits and Systems—I: Express Briefs
IEEE Transactions on Circuits and Systems—I: Fundamental Theory and Applications
IEEE Transactions on Circuits and Systems—II: Analog and Digital Signal Processing
IEEE Transactions on Circuits and Systems
IEEE Transactions on Circuit Theory
IEEE Transactions on Circuits and Systems for Video Technology
IEEE Transactions on Communications
IEEE Communications Letters
IEEE Transactions on Communications Technology
IEEE Transactions on Components and Packaging Technology
IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part A
IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part B
IEEE Transactions on Components, Packaging, and Manufacturing Technology, Part C
IEEE Transactions on Components, Hybrids, and Technology
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems
IEEE Transactions on Computers
IEEE Transactions on Consumer Electronics
IEEE Transactions on Control Systems Technology
IEEE Transactions on Device and Materials Reliability
IEEE Transactions on Dielectrics and Electrical Insulation
IEEE Transactions on Education
IEEE Transactions on Electromagnetic Compatibility
IEEE Transactions on Electron Devices
IEEE Electron Device Letters
(under 1974)
IEEE Commun. Lett.
(under 1971)
IEEE Trans. Electron Devices
IEEE Transactions on Electronics Packaging Manufacturing
IEEE Transactions on Energy Conversion
IEEE Transactions on Engineering Management
IEEE Transactions on Evolutionary Computation
IEEE Transactions on Fuzzy Systems
IEEE Transactions on Geoscience and Remote Sensing
IEEE Transactions on Geoscience Electronics
IEEE Transactions on Image Processing
IEEE Transactions on Industrial Electronics
IEEE Transactions on Industry Applications
IEEE Transactions on Information Forensics and Security
IEEE Transactions on Information Technology in Biomedicine
IEEE Transactions on Information Theory
IEEE Transactions on Instrumentation and Measurement
IEEE Transactions on Instrumentation
IEEE Transactions on Intelligent Transportation Systems
IEEE Transactions on Knowledge and Data Engineering
IEEE Transactions on Magnetics
IEEE Transactions on Manufacturing Technology
IEEE/ASME Transactions on Mechatronics
IEEE Transactions on Medical Imaging
IEEE Transactions on Microwave and Guided Wave Letters
IEEE Transactions on Microwave and Wireless Components Letters
IEEE Transactions on Microwave Theory and Techniques
IEEE Transactions on Multimedia
IEEE Transactions on Nanotechnology
IEEE/ACM Transactions on Networking
IEEE Transactions on Neural Networks
IEEE Transactions on Neural Systems and Rehabilitation Engineering
IEEE Transactions on Nuclear Science
IEEE Journal of Oceanic Engineering
IEEE Transactions on Parallel and Distributed Systems
IEEE Transactions on Parts, Hybrids, and Manufacturing Technology
IEEE Transactions on Parts and Material Packaging
IEEE Transactions on Pattern Analysis and Machine Intelligence
IEEE Photonics Technology Letters
IEEE Transactions on Plasma Science
IEEE Transactions on Power Apparatus and Systems
IEEE Transactions on Power Delivery
IEEE Transactions on Power Electronics
IEEE Power Electronics Letters
IEEE Transactions on Power Systems
IEEE Transactions on Professional Communication
IEEE Journal of Quantum Electronics
IEEE Transactions on Rehabilitation Engineering
IEEE Transactions on Reliability
IEEE Transactions on Robotics and Automation
IEEE Journal on Selected Areas in Communications
IEEE Journal on Selected Topics in Quantum Electronics
IEEE Transactions on Selected Topics in Signal Processing

IEEE Trans. Inf. Theory
IEEE Trans. Multimedia

**IEEE Magazines and Abbreviations**

| IEEE Computer | IEEE Computer |
| IEEE Concurrency | IEEE Concurrency |
IEEE Expert
IEEE Industry Applications Magazine
IEEE Instrumentation and Measurement Magazine
IEEE Intelligent Systems (formerly IEEE Expert)
IEEE Internet Computing
IEEE IT Professional
IEEE Micro
IEEE Microwave Magazine
IEEE Multimedia
IEEE Network
IEEE Nanotechnology Magazine
IEEE Personal Communications
IEEE Potentials
IEEE Power Engineering Review
IEEE Robotics and Automation Magazine
IEEE Signal Processing Magazine
IEEE ASSP Mag.
IEEE Software
IEEE Spectrum
IEEE Technology and Society Magazine
IEEE Vehicular Technology Magazine
Today’s Engineer

IEEE Expert (until 1997)
IEEE Intell. Syst.
IEEE Internet Comput.
IEEE IT Prof.
IEEE Micro
IEEE Microwave
IEEE Multimedia
IEEE Network
IEEE Nanotechnol. Mag.
IEEE Potentials
IEEE Softw.
IEEE Spectr.
IEEE Veh. Technol. Mag
Today’s Eng.