

**SELECTIVE GUIDE TO THE LITERATURE
ON COMPUTER GRAPHICS**

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This guide is intended to provide a substantial list of sources in the field of computer graphics, which can be defined as the display, representation, manipulation, alteration, and storage of objects in digital form. It is aimed primarily at students, academics, and professionals who are, or wish to become, involved in computer graphics in a technical way. The technical aspect is definitely emphasized in this guide; only a few publications whose main focus is the graphics industry are included, and no sources that concentrate on the artistic or aesthetic aspects of computer graphics are listed (although some entries deal with technical aspects of computer graphics applied to art and animation). Also not included are tutorial or reference publications that deal with specific graphics software packages; such publications are numerous and readily available in technical bookstores, and become out of date with every new release of the software. (However, internet newsgroups that offer ongoing online discussions of specific packages are listed in the “Internet Resources” section.)

This guide is divided into subsections based on the format of the sources. The first two sections list sources that help you find computer graphics literature: “Bibliographies and Literature Guides,” and “Indexes and Abstracts.” Then come sections that provide concise information: “Encyclopedias,” “Dictionaries,” “Handbooks and Tables,” and “Directories.” The next section, “Standards,” is important for those writing or using commercial packages. The next three list publications which contain most of the literature of computer graphics: “Major Periodicals,” “Major Conferences,” and “Important Books.” Note that you may want to consult some of the sources listed in the first two sections in order to make the best use of these three sections, particularly the “Major Periodicals” and “Major Conferences” sections. In the last section before the appendix, useful Internet sources that do not fit into any of the traditional bibliographic categories are described. Finally, an appendix provides contact information for organizations that can be of great use to computer graphics professionals. Many of the organizations listed therein can supply you with documents and other publications mentioned in this guide.

Bibliographies and literature guides, such as the one you are reading now, help the reader identify useful sources of information in a subject area. Unlike indexes and abstracts (listed in the next section), which provide a formal way of looking up documents by subject headings, keywords, title, author, etc., a bibliography or literature guide usually takes a broader, less formalized approach, and includes “bigger” material (such as journals, instead of articles within journals). Often the sources listed in a bibliography or literature guide are broadly categorized by subject, format, or type of material. Bibliographies and literature guides are especially helpful to those who are new to a field of study and desire guidance in finding source material.

In addition to this literature guide, the guides listed in this section may be helpful in identifying useful sources of information in the field of computer graphics.

Achilles, Alf-Christian. A Collection of Computer Science Bibliographies. World Wide Web site.

This is a free online bibliography of free online bibliographies in computer science. The bibliographies are categorized by subject; one of the subject categories is “Computer Graphics and Vision.” This site is mirrored at various locations throughout the world, and can be accessed using a Web browser. (See the site given here for mirror sites.) The URL of the original site is:

<http://liinwww.ira.uka.de/bibliography/index.html> .

Hildebrandt, Darlene Myers, compiler and ed. Computing Information Directory. 13th ed. Pullman, WA: Computing Information Directory, 1996.

This is a comprehensive bibliography of printed computer science resources. There is no separate section for computer graphics, as resources are categorized by format rather than by topic. There is, however, a “Master Subject Index” with an entry for “Computer Graphics” that includes see-also references to related subjects.

McGee, Kate, and Catherine Matthews, compiling eds. The Design of Interactive Computer Displays: A Guide to the Select Literature. Lawrence, KS: Report Store, 1985.

This bibliography and the one listed immediately below provide well-written descriptions of many of the sources in the field of interactive displays. Although slightly dated, most of the sources and descriptions are still valid.

McGee, Kate, compiling ed., and Elizabeth A. Scalet and Charles D. Rezac, associate eds. The Design of Interactive Computer Displays II: A Guide to Selected Periodicals. Lawrence, KS: Report Store, 1986.

Indexes and abstracts are tools for locating journal articles and other materials, such as technical reports, articles in conference proceedings, etc. Access is provided by subject, author, and usually by other means as well. At least one index or abstract has been developed for each major scientific or technical field. Indexes provide ways of finding articles, whereas abstracts additionally include summaries of most or all articles listed.

Unlike bibliographies, which generally include material deemed important to the editor or compiler, indexes and abstracts follow formal rules governing what is included in them. For example, an index might include articles from specific journals; when a new journal commences publication, the editors evaluate it and make a decision as to whether to index any or all of its articles.

The scope of the indexes and abstracts listed below varies. Most are not specific to the field of computer graphics, but instead cover broader fields, such as computer science, mathematics, or a collection of broad fields. Attention must be paid when using indexes and abstracts to the type of material covered (journal articles, technical reports, conference proceedings, etc.), the depth of coverage (how many entries are added, from what sources, in a given period of time), and the period of coverage. (Be aware that usually the coverage of an electronic index or abstract begins at a later date than that of its printed counterpart.)

ACM SIGGRAPH Online Bibliography Database. New York: ACM SIGGRAPH.

This database is available online only. It can be accessed on the World Wide Web at the SIGGRAPH home page at <http://siggraph.org/>, or by telnetting to “siggraph.org” and logging in as “biblio”.

ACM Guide to Computing Literature. New York: Association for Computing Machinery, 1977- .

This index provides coverage of computer science literature, including journal articles, conferences, and conference papers. Also included are many books and articles within books. A CD-ROM version is slated for release in late 1996.

CompuMath Citation Index. Philadelphia: Institute for Scientific Information, 1981- . (Five-year cumulation 1976-1980 published retrospectively.)

This is similar to Science Citation Index (listed in this section), but limited to the fields of applied mathematics, computer science, statistics, operations research, and related disciplines. Currently there is no CD-ROM version available.

Computer and Control Abstracts: Science Abstracts Series C. (Section C of the INSPEC database.) Piscataway, NJ: Institution of Electrical Engineers (in association with IEEE), 1966- . Online Vendors: DIALOG, STN, Data-Star, 1969- .

This index aims to “cover all aspects of computers and control.” It is comprehensive, and includes journal articles, conference papers, and some books, reports, and dissertations.

Computer and Information Systems Abstracts Journal. Bethesda, MD: Cambridge Scientific Abstracts, 1962- .

Comprehensive coverage of international literature is provided by this abstracting publication.

Electrical and Electronics Abstracts: Science Abstracts Series B. (Section B of the INSPEC database.) Piscataway, NJ: Institution of Electrical Engineers (in association with IEEE), 1898- . Online Vendors: DIALOG, STN, Data-Star, 1969- .

This provides thorough coverage of the scientific and technical literature in electrical and electronics engineering. Sources include books, journals, conferences, and reports from all over the world. It has fairly good computer graphics coverage, especially in hardware topics.

Engineering Index. Hoboken, NJ: Engineering Information, Inc., 1884- .

CD-ROM: Compendex Plus, updated quarterly, 1986- .

Online Vendors: Data-Star, DIALOG, Orbit, STN, 1970- .

Available via World Wide Web with an account. For information see the Engineering Information Inc. home page at <http://www.ei.org/>.

This index covers all fields of engineering and related disciplines. Journal articles, technical reports, conference proceedings, and other publications are covered. Articles within conference proceedings are included beginning in 1989.

Index to IEEE Publications. Piscataway, NJ: IEEE, 1971- .

This provides complete coverage of the publications of the Institute of Electrical and Electronics Engineers (IEEE). (See the appendix for a description of IEEE.) No other publications are included. Near the beginning of volume 1 of each year’s index is a list of special issues and special sections that appeared in IEEE periodicals during the preceding year.

Index to Scientific and Technical Proceedings. Philadelphia: Institute for Scientific Information, 1978- .

CD-ROM: ISTP, 1991- .

This is an index to scientific conference proceedings. As it appears monthly and is very current, it can be used as a current awareness service. Conferences are listed (with their tables of contents) by category; one of the categories is “Computer Science, software, graphics, programming.” Other ways of finding entries, such as a keyword-in-title index, are also provided.

Mathematical Reviews. Providence, RI: American Mathematical Society, 1940- .

CD-ROM: MathSci Disk, 1940- .

Online Vendors: DIALOG, 1940- .

Available via World Wide Web with an account as MathSciNet. For information see the MathSciNet home page at <http://www.ams.org/mathscinet/>.

This is a primary index to mathematical literature. It contains many references to mathematical treatments of computer graphics.

NTIS Bibliographic Database. In printed form, it is currently produced as Government Reports Announcements and Index. Springfield, VA: National Technical Information Service, 1975- .

CD-ROM: NTIS, 1980- .

Online Vendors: Data-Star, DIALOG, Orbit, STN, 1964- .

This is the primary index for reports of government-sponsored research.

Science Citation Index. Philadelphia: Institute for Scientific Information, 1955- .

CD-ROM: Science Citation Index, updated quarterly, 1980- .

Online Vendors: DIALOG, STN, DIMDI, Data-Star, Orbit, 1974- .

This tool provides various ways to search the literature in virtually all scientific disciplines. In addition to author and keyword-in-title searches, you can find articles that have cited a given article of interest (hence the name of the index). In the CD-ROM version, you can search for articles that share references with an article of interest.

Encyclopedias are a good, and often overlooked means of learning the basic information about a field. We are all familiar with the standard, general encyclopedias found in any public library. However, there are many specialized subject encyclopedias that cover their topics in much greater depth than the general encyclopedias do. Some such specialized encyclopedias are listed here.

Considine, Douglas M., ed. Van Nostrand's Scientific Encyclopedia. 8th ed. New York: Van Nostrand Reinhold, 1995.

This has an article on computer graphics on pages 776-780, as well as other articles on related topics.

Murray, James D., and William VanRyper. Encyclopedia of Graphics File Formats. 1st ed. Sebastopol, CA: O'Reilly & Associates, 1994.

A CD-ROM is included which contains graphics format specifications, code, images, and software packages for PC, Unix, and Macintosh platforms.

Ralston, Anthony, and Edwin D. Reilly, eds. Encyclopedia of Computer Science. 3rd ed. New York: Van Nostrand Reinhold, 1993. (4th ed. scheduled for release in July 1997.)

This has an excellent article on computer graphics on pages 294-305. There are many other articles on topics related to computer graphics.

Dictionaries, like encyclopedias, are often overlooked as a valuable resource. Also like encyclopedias, there are many specialized dictionaries covering specific fields, and these include definitions for terms not found in even the most complete general dictionaries.

Association for Information and Image Management. Glossary of Imaging Technology. 7th ed. Silver Springs, MD: Association for Information and Image Management, 1992.

This glossary is issued as a technical report (report number TR2-1992) by the Association. In earlier editions it was limited to micrographics terms and this is still evident in the selection of entries. Computer graphics terms have been added, however, making it useful for those interested in this field.

Freedman, Alan. Computer Glossary: the Complete Illustrated Dictionary. 7th ed. New York: AMACOM, 1995.

The stated purpose of this glossary, which the author says is his "life's work," is to define every important computer term. The definitions are clear and well thought out, and many are enhanced with illustrations. In the beginning is a list of topics and common terms used in those topics; "graphics and multimedia," with 35 terms, is one of them.

IEEE. IEEE Standard Glossary of Computer Graphics Terminology. New York: IEEE Press, 1993.

This is a fairly short (23 pages; definitions begin on page 8) dictionary of essential computer graphics terms. Some entries are illustrated.

Latham, Roy. Dictionary of Computer Graphics and Virtual Reality. 2nd ed. New York: Springer-Verlag, 1995.

This is a fairly comprehensive dictionary containing precise and thorough definitions. Many abbreviations are included. Pronunciations are given for those terms for which it is not obvious. A few definitions are illustrated.

Roncarelli, Robi. The Computer Animation Dictionary. New York: Springer-Verlag, 1989.

This is intended to be a quick reference rather than to be exhaustive. Most of the defined terms are technical terms in animation and graphics, as opposed to terms from the film industry or from printing and typesetting. There are no illustrations.

Spencer, Donald D. Illustrated Computer Graphics Dictionary. Ormond Beach, FL: Camelot, 1993.

This 299-page reference thoroughly covers the field of computer graphics, and also includes many terms from the graphics field in general. A high percentage of the entries are illustrated.

Vince, John. The Language of Computer Graphics: a Dictionary of Terms and Concepts. New

York: Van Nostrand Reinhold, 1990.

This dictionary includes over 800 terms. Definitions are generally easy to understand.

Handbooks are concise reference sources. They are especially valuable for looking up specific pieces of information, for example, “How do I rotate a line segment in a plane around the origin?” or “What universities in California offer a degree program in computer graphics?”.

ACM SIGGRAPH. Computer Graphics Career Handbook. New York: ACM SIGGRAPH, 1991.

This handbook provides a thorough look at the computer graphics field and what career opportunities are available in it. It has twenty-one “career profiles” of individuals who have made a career in the graphics field. Also provided is a list of educational institutions with computer graphics programs.

Collected Algorithms from ACM. New York: ACM, 1980-1983, with quarterly supplements thereafter.

This is a collection of the algorithms published in ACM journals. Supplements are distributed on microfiche, and computer code on floppy disks or magnetic tape is available from ACM. This is a good reference source for graphics algorithms.

Henderson, Lofton R., and Anne M. Mumford. The CGM Handbook. San Diego: Academic Press, 1993.

This handbook provides basic information about the Computer Graphics Metafile standard, a standard for graphical data storage.

Kosko, Linda, ed. PHIGS Reference Manual. 1st ed. Sebastopol, CA: O'Reilly & Associates, 1992.

This is a standard reference manual for PHIGS (Programmer's Hierarchical Interactive Graphics System), which defines an interface between applications programs and a computer graphics system.

Mortenson, Michael E. Computer Graphics Handbook: Geometry and Mathematics. New York: Industrial Press, 1990.

This is a reference source that is useful to keep handy when programming graphics applications. It has 256 one-page entries, each treating a specific technique or concept, e.g., “Homogenous Transformations” or “Surfaces: Curvature Approximation.”

Stevens, Roger T. The C Graphics Handbook. Boston: Academic Press, 1992.

This guide provides multiple ways of performing basic graphics operations. Source code is included. Also provided is detailed information on various display modes.

Computer Graphics World Buyers Guide. (Formerly Computer Graphics Directory.) Nashua, NH: PennWell, 1983- . Annual.

These directories can help you find the hardware, software, or human beings that you need.

IEEE. IEEE Membership Directory. New York: IEEE Press. Annual.

Computer graphics standards establish uniform protocols and information formats that permit the portability of graphics applications among various computing systems and devices. Graphics standards are frequently updated or amended to reflect ongoing developments in computer hardware and software. The following is a list of computer graphics standards, along with some other relevant sources.

At the beginning of each standard identifier is one or more abbreviations designating the body that issues the standard. The computer graphics standards listed here are all issued jointly by more than one agency. Following is a list of issuing bodies. For contact information consult the appendix.

ANSI: American National Standards Institute

IEEE: Institute of Electrical and Electronics Engineers

ISO: International Organization for Standardization

IEC: International Electrotechnical Commission

The ANSI designation of standards is, in many cases, slightly different from that of other organizations with which it jointly issues standards. For example, the standard which ANSI labels “ANSI/ISO 9592-1-1989” is called “ISO/IEC 9592-1:1989” by ISO. In this bibliography ANSI’s designation is used. (All the standards here are issued by ANSI as well as by at least one other organization.) The difference between ANSI’s designation and that of another organization does not extend to the numbering or the title, and therefore would not be a problem if the reader were to contact another organization regarding a standard.

ANSI/IEEE 610.4-1990. Glossary of Image Processing and Pattern Recognition Terminology.

ANSI/IEEE 610.6-1992. Glossary of Computer Graphics Terminology.

ANSI/ISO/IEC 11072-1992. Information Technology--Computer Graphics--Computer Graphics Reference Model.

ANSI/ISO 9592-1-1989. Information Processing Systems - Computer Graphics - Programmer’s Hierarchical Interactive Graphics System (PHIGS) Part 1: Functional Description. (Includes supplement ANSI/ISO 9592-1a-1993.)

9592-2-1989. Part 2: Archive File Format. (Includes supplement ANSI/ISO 9592-2a-1993.)

9592-3-1989. Part 3: Clear Text Encoding of Archive File. (Includes supplement 9592-3a-1992.)

9592-4-1992. Part 4: Plus Lumiere and Surfaces, PHIGS PLUS.

ANSI/ISO/IEC 8632-1990. Information Processing Systems--Computer Graphics--Metafile for the Storage and Transfer of Picture Description Information.

8632-1-1992. Part 1: Functional Specification. (Includes supplement ANSI/ISO/IEC 8632-1-1992/AM1:1994.)

8632-2-1992. Part 2: Character Encoding. (Includes supplement ANSI/ISO/IEC 8632-2-1992/AM1:1994.)

8632-3-1992. Part 3: Binary Encoding. (Includes supplement ANSI/ISO/IEC 8632-3-1992/AM1:1994.)

8632-4-1992. Part 4: Clear Text Encoding. (Includes supplement ANSI/ISO/IEC 8632-4-1992/AM1:1994.)

ANSI/ISO/IEC 10641-1993. Information Technology--Computer Graphics and Image Processing--Conformance Testing of Implementations of Graphics Standards.

ANSI/ISO/IEC 9636-1-1991. Information Technology - Computer Graphics - Interfacing Techniques for Dialogues with Graphical Devices (CGI) - Functional Specification - Part 1: Overview, Profiles, and Conformance.

9636-2-1991. Part 2: Control.

9636-3-1991. Part 3: Output.

9636-4-1991. Part 4: Segments.

9636-5-1991. Part 5: Input and Echoing.

9636-6-1991. Part 6: Raster.

ISO/IEC 9637-1-1994. Information Technology - Computer Graphics - Interfacing Techniques for Dialogues with Graphical Devices (CGI) - Data Stream Binding - Part 1: Character Encoding.

9637-2-1992. Part 2: Binary Encoding.

This is a select list of periodicals, some of which are totally devoted to computer graphics, and others that are broader in scope but frequently contain articles relating to computer graphics. These journals cover a wide range of perspectives within the graphics field, ranging from the purely academic, to those that deal with strictly practical applications.

ACM Transactions on Graphics. New York: Association for Computing Machinery, quarterly, 1982- .

This is a standard scholarly journal on computer graphics.

CG Professional. San Francisco: Graphic Channels, monthly, 1989- .

Aimed at the professional, this publication covers computer graphics technologies and products.

Computer Graphics. New York: Association for Computing Machinery, Special Interest Group on Computer Graphics (SIGGRAPH), quarterly, 1976- .

This is the bulletin of SIGGRAPH, the major scholarly computer graphics association (a division of Association for Computing Machinery).

Computer Graphics. New York: Harris Publications, 1987- .

This magazine covers computer graphics for Macintosh and IBM personal computers.

Computer Graphics Forum. Oxford, UK: Blackwell, quarterly, 1982- .

This is a refereed journal covering the computer graphics industry and developments. It is the main publication of Eurographics Association, the primary professional and academic computer graphics association in Europe. Since 1992, the proceedings of the Eurographics Association's Annual Conference, Eurographics, have been published as a special issue of this journal.

Computer Graphics World. Nashua, NH: PenWell, monthly, 1978- .

This is an industry-oriented publication.

Computer Vision and Image Understanding. San Diego: Academic Press, bimonthly, 1972- . (Formerly CVGIP: Image Understanding.)

This journal contains highly theoretical articles on automated understanding of graphical representations.

Computers & Graphics. Oxford, UK: Elsevier (Pergamon), bimonthly, 1975- .

The articles in this journal are mostly on research in computer graphics, although some tutorial articles are included. Many issues are devoted to special topics.

Computing Reviews. New York: Association for Computing Machinery, monthly, 1960- .

This publication contains short signed reviews of current computer science literature. The

reviews are categorized by subject; computer graphics is found in section I.3. Most of the reviewed literature consists of books and journal articles.

Displays. Oxford, UK: Butterworth-Heinemann, quarterly, 1979- .

This is a refereed journal covering research and commercial developments in computer display technology, including graphics technology.

Graphical Models and Image Processing. San Diego: Academic Press, bimonthly, 1972- .

(Formerly CVGIP: Graphical Models and Image Processing.)

This journal contains highly theoretical articles.

IEEE Computer Graphics and Applications. Los Alamitos, CA: IEEE Computer Society Press, monthly, 1981- .

This covers computer graphics research and applications for professionals.

IEEE Multimedia. Los Alamitos, CA: IEEE Computer Society Press, quarterly, 1994- .

This publication contains a variety of articles, including reports of projects, research, tutorials, etc. The content is generally more accessible than that of a pure research journal.

Image and Vision Computing. Oxford, UK: Butterworth-Heinemann, 10 issues per year, 1983- .

This focuses on graphics applications in various disciplines.

Journal of Educational Multimedia and Hypermedia. Charlottesville, VA: Association for the Advancement of Computing in Education, quarterly, 1992- .

Research and applications are presented on multimedia and hypermedia tools that can be used in the educational process.

Journal of Molecular Graphics. Newton, MA: Butterworth-Heinemann, bimonthly, 1983- .

This refereed journal, produced by the Molecular Graphics Society, covers research on the application of computer graphics to molecular research.

Journal of Visual Communication and Image Representation. San Diego, CA: Academic Press, quarterly, 1990- .

This is a refereed journal covering visual communication and image representation in a multidisciplinary manner.

The Journal of Visualization and Computer Animation. Chichester, UK: John Wiley & Sons, 5 issues per year, 1990- .

This covers computer animation techniques applied to science and art.

Multimedia Week. Potomac, MD: Phillips Business Information, weekly, 1992- .

This is an industry-oriented publication.

The Visual Computer. Berlin: Springer-Verlag, 10 issues per year, 1985- .

This “Official journal of the Computer Graphics Society” covers computer graphics, vision, and imaging, with an emphasis on applications.

Conference proceedings are the most timely sources of technical information in computer graphics; often they are more important than journal literature for the researcher. They appear in different forms, e.g., as special issues of journals, or as books in a series. (ACM is sometimes inconsistent in this regard.) Following is a selected list of proceedings of the most prominent conferences that are held regularly.

Conferences sponsored by the Association for Computing Machinery (ACM) or the Institute of Electrical and Electronics Engineers (IEEE) can be ordered through their respective World Wide Web sites. (See the appendix for organizations and their World Wide Web site addresses.)

Annual Symposium on Computational Geometry. New York: ACM Press, 1985- .
Sponsored by ACM Special Interest Group on Computer Graphics, and ACM Special Interest Group on Algorithms and Computation Theory.

Conference on Computer Graphics and Interactive Techniques. See SIGGRAPH.

Design Automation Conference. New York: IEEE, 1975- .
Sponsored by ACM Special Interest Group on Design Automation and the IEEE Computer Society.

Eurographics. (Since 1992 published as a special issue of Computer Graphics Forum; earlier issues published by North-Holland, New York.) 1980- .
This annual conference is the major computer graphics conference in Europe. Sponsored by the European Association for Computer Graphics (Eurographics).

European Design Automation Conference. Los Alamitos, CA: IEEE Computer Society Press, 1990- .
Sponsored by the IEEE Computer Society and various other organizations.

Graphics Interface Conference. Toronto: Canadian Information Processing Society, 1982- .
Sponsored by the Canadian Man-Computer Communications Society and the National Computer Graphics Association of Canada.

IEEE/ACM International Conference on Computer Aided Design. (Formerly IEEE International Conference on Computer Aided Design.) Los Alamitos, CA: IEEE Computer Society Press, 1983- .
Sponsored by the IEEE Circuits & Systems Society and the ACM Special Interest Group on Design Automation.

IEEE Computer Society Conference on Computer Vision and Pattern Recognition. Los

Alamitos, CA: IEEE Computer Society Press, 1983- .

Sponsored by the IEEE Computer Society in cooperation with the International Association for Pattern Recognition.

IEEE Conference on Visualization. Los Alamitos, CA: IEEE Computer Society Press, 1990- .

Sponsored by the IEEE Computer Society Technical Committee on Computer Graphics, in cooperation with the ACM Special Interest Group on Graphics.

International ACM Conference on Multimedia. New York: ACM, 1993- .

Sponsored by various ACM Special Interest Groups.

SIGGRAPH. New York: ACM, 1974- .

Sponsored by the ACM Special Interest Group on Computer Graphics. Also sometimes called Conference on Computer Graphics and Interactive Techniques.

Symposium on Interactive 3D Graphics. New York: ACM, 1990- .

Sponsored by various organizations, including the ACM Special Interest Group on Computer Graphics.

Symposium on Solid Modeling Foundations and Applications. New York: ACM, 1991- .

Sponsored by ACM Special Interest Group on Computer Graphics.

Volume Visualization Symposium. (Formerly Volume Visualization Workshop.) New York: ACM, 1990- .

Sponsored by the ACM Special Interest Group on Graphics.

There are many books on computer graphics, far more than can be listed here. The books in this list were selected because they deal with fundamental topics, are not too esoteric or too low-level or popular, and are not specific to any particular hardware or platforms. There is a certain amount of subjectivity and even arbitrariness in this list. Nevertheless, these books can provide a good starting point to the basic graphics literature.

Arvo, James, ed. Graphics Gems II. San Diego, CA: Academic Press, 1991.

This is a sequel to Graphics Gems (listed in this section under the editor, Andrew Glassner).

Brown, C. Wayne, and Barry J. Shepherd. Graphics File Formats: Reference and Guide. Greenwich, CT: Manning Publications, 1995.

This book aims to inform the reader about the theory of graphics formats, and design issues. An interesting chapter covers the history of image creation and manipulation, beginning in pre-computer times. There is an appendix that gives summaries of 51 specific formats.

Earnshaw, Rae, and John Vince, eds. Computer Graphics: Developments in Virtual Environments. New York: Academic Press, 1995.

Virtual environments are at the heart of all virtual reality systems, and are therefore an important part of the computer graphics field. Each chapter of this book is written by a different expert. The treatment is highly technical and mathematical.

Fiume, Eugene L. The Mathematical Structure of Raster Graphics. Boston: Academic Press, 1989.

This is based on the author's Ph.D. dissertation.

Foley, James D. Introduction to Computer Graphics. Reading, MA: Addison-Wesley, 1994.

This is an abbreviated and simplified version of Computer Graphics: Principles and Practice, second edition, by the same author (op. cit.).

Foley, James D., et al. Computer Graphics: Principles and Practice. 2nd ed. Reading, MA: Addison-Wesley, 1990.

This excellent text of over 1000 pages covers beginning through advanced graphics topics.

Foley, James D., et al. The Fundamentals of Interactive Computer Graphics. 2nd ed. Reading, MA: Addison-Wesley, 1990.

This is a tutorial as well as a reference source on all fundamental aspects of computer graphics. No prior knowledge of computer graphics is assumed, although it progresses to advanced topics.

Gallagher, Richard S. Computer Visualization: Graphics Techniques for Scientific and Engineering Analysis. Ann Arbor, MI: CRC Press, 1995.

This book treats the topic of 3-D imaging for visualization in engineering and science. It has three sections: an overview of computer graphics with a historical perspective, a section containing the “meat” of the book which discusses imaging techniques, and a section on implementation issues and future trends.

Gaman, William A., and William A. Giovinazzo. PHIGS by Example. New York: Springer-Verlag, 1991.

PHIGS (Programmer’s Hierarchical Interactive Graphics System) is a standard that defines an interface between a graphics system and an applications program. (See the section in this guide entitled “Standards.”) This book is intended for PHIGS novices.

Glassner, Andrew S., ed. Graphics Gems. San Diego, CA: Academic Press, 1990.

This handy book is “a collection of algorithms, programs, and mathematical techniques for the computer graphics programmer”.

Gross, Markus. Visual Computing. New York: Springer-Verlag, 1994.

This book treats and ties together into a conceptual whole several topics related to computer graphics. These include the creation of pictorial representations from computer based models, image processing and analysis, and human perception of visual images.

Kauffman, A., ed. Rendering, Visualization, and Rasterization Hardware. New York: Springer-Verlag, 1993.

This is a collection of articles on various topics in computer graphics hardware.

Kay, David C., and John R. Levine. Graphics File Formats. 2nd ed. New York: McGraw-Hill, 1995.

This has clear and detailed specifications of 30 formats, and brief descriptions of others. Introductory chapters give overviews of graphics theory and choosing a format.

Levine, John R. Programming for Graphics Files in C and C++. New York: John Wiley & Sons, 1994.

This reference includes C and C++ source code to handle many different graphics formats, as well as explanatory text.

McAllister, David F., ed. Stereo Computer Graphics and Other True 3D Technologies. Princeton, NJ: Princeton University Press, 1993.

This is a collection of articles on advanced topics in stereo and 3D computer graphics.

McCord, James. Borland C++ Programmer’s Guide to Graphics. Carmel, IN: Sams, 1991.

This is a thorough, 800-page reference.

Mortenson, Michael E. Computer Graphics: An Introduction to the Mathematics and

Geometry. New York: Industrial Press, 1989.

Written primarily as a college textbook for computer science majors, this book lays a mathematical foundation for a thorough understanding of computer graphics principles and techniques. An understanding of trigonometry is necessary to profit from the book, and a knowledge of solid geometry and computer programming would also be helpful.

Pokorny, Cornel K., and Curtis F. Gerald. Computer Graphics: The Principles Behind the Art and Science. Irvine, CA: Franklin Beedle, 1989.

This book is true to its title; it deals with the basic principles of computer graphics, and not specific applications or platforms. It is written for college students majoring in computer science, engineering, or mathematics; as well as developers of graphics systems.

Watt, Alan H. 3D Computer Graphics, 2nd ed. Reading, MA: Addison-Wesley, 1993.

This book comprises a thorough introduction to techniques for producing shaded representations of three-dimensional object on a graphics monitor. It also provides the theoretical background necessary to understand these techniques.

More and more material on computer graphics appears continually on the Internet. Internet resources that fit neatly into a traditional category, such as bibliographies, are listed under those categories. Other resources, which are unique to a computer network environment, are listed in this section.

Resources on the Internet tend to be more volatile than printed resources. They change, sometimes drastically, or disappear altogether. They may be maintained and updated faithfully for awhile, and later allowed to languish and become out-of-date. The link structure of World-Wide-Web hypertext resources in many cases changes on a very frequent basis, leaving the user frustrated. Despite these problems, the Internet has become a major repository of computer graphics resources and cannot be ignored. The sources in this list have been chosen as ones that, in the opinion of the editor, have a certain degree of stability. Nevertheless, it can be expected that some changes will occur in the near future.

Internet Newsgroups (Usenet)

Newsgroups are in essence electronic bulletin boards. Anyone may post a message and anyone may read the messages that have been posted, using one of the many available newsreader programs. Newsgroups provide a forum for discussions, and for asking and answering questions. Some newsgroups are moderated; that is, a moderator screens messages before they are posted, deleting those that are inappropriate for any reason. Most newsgroups, however, are not moderated.

Following is a list of newsgroups devoted to computer graphics topics. Some newsgroups are fairly stable and have been around for years; others come and go. Therefore, some of these newsgroups may have ceased to exist or become inactive, and others may have formed, since this list was compiled.

comp.graphics--This is the most general, and perhaps the most important, of the newsgroups devoted to graphics topics.

- comp.graphics.algorithms
- comp.graphics.animation
- comp.graphics.api.inventor
- comp.graphics.api.misc
- comp.graphics.api.opengl
- comp.graphics.api.pexlib
- comp.graphics.apps.alias
- comp.graphics.apps.avs
- comp.graphics.apps.data-explorer
- comp.graphics.apps.freehand
- comp.graphics.apps.gnuplot

comp.graphics.apps.iris-explorer
comp.graphics.apps.lightwave
comp.graphics.apps.pagemaker
comp.graphics.apps.photoshop
comp.graphics.apps.softimage
comp.graphics.apps.wavefront
comp.graphics.misc
comp.graphics.packages.3dstudio
comp.graphics.rendering.misc
comp.graphics.rendering.raytracing
comp.graphics.rendering.renderman
comp.graphics.visualization
comp.os.ms-windows.programmer.graphics

Frequently Asked Questions (FAQ's)

Some newsgroups periodically post messages that provide answers to frequently asked questions. Some of the graphics newsgroups regularly post excellent, informative FAQ messages that answer many basic questions about graphics and point the reader to additional sources of information. These messages are maintained and updated regularly by dedicated volunteers. They are stored at sites that can be accessed at any time, without having to wait for them to appear in the newsgroups.

ASCII Versions: You can get ASCII versions at the following locations via anonymous ftp, or by using a Web browser, such as Netscape:

<ftp://rtfm.mit.edu/pub/usenet/news.answers/graphics/>
<ftp://rtfm.mit.edu/pub/usenet/comp.graphics/>

HTML Versions: These can be viewed with a Web browser. They are available at

<http://www.cis.ohio-state.edu/hypertext/faq/usenet/graphics/>

ACM SIGGRAPH Online Bibliography Database. See entry in “Indexes and Abstracts” section.

Program of Computer Graphics. World Wide Web site developed and maintained by Cornell University Program of Computer Graphics. Located at <http://www.graphics.cornell.edu/>. Many universities have a Web site devoted to computer science, or specifically to computer graphics. This one is noteworthy in that it has a link entitled “What is Computer Graphics?” which is described as “an informal introduction to computer graphics, assuming no prior knowledge.”

Appendix: Selected Publishers & Organizations

American National Standards Institute (ANSI)

11 W. 42nd St., 13th Fl.

New York, NY 10036

(212) 642-4900

ANSI creates, updates, and publishes standards covering a wide range of fields, including computer graphics. Information about ANSI standards, including complete contact and ordering information, can be found at their World Wide Web site at <http://www.ansi.org/>.

Association for Computing Machinery (ACM)

1515 Broadway, 17th floor

New York, NY 10036-5701

(212) 869-7440

This is the premier professional and scholarly organization in the field of computer science. ACM publishes many books and journals, including ACM Transactions on Graphics, listed in this guide. There are many special interest groups, including SIGGRAPH (listed in this section), which is devoted to computer graphics. More information on ACM can be found at their World Wide Web site at <http://www.acm.org/>.

ACM Special Interest Group on Computer Graphics (SIGGRAPH)

1515 Broadway

New York, NY 10036

(212) 869-7440

This is a special interest group of the Association for Computing Machinery (listed in this section) devoted to computer graphics. They publish the journal Computer Graphics, listed in this guide. More information can be found at their World Wide Web site at <http://siggraph.org/>.

European Association for Computer Graphics (Eurographics)

P.O. Box 16

CH-1288 Aire-la-Ville

Switzerland

This is the primary professional and academic computer graphics association of Europe. They publish Computer Graphics Forum (in cooperation with Blackwell), and sponsor the Eurographics Annual Conference. (Both are listed in this guide.) More information can be found at their World Wide Web site, at <http://www.cwi.nl/Eurographics/>. They can also be contacted by email at info@eg.org.

IEEE Computer Society

1730 Massachusetts Ave. NW

Washington, DC 20036

This is a division of the Institute of Electrical and Electronics Engineers (see below), devoted

exclusively to computer science topics. They have a World Wide Web site at **<http://www.computer.org/>**.

Institute of Electrical and Electronics Engineers (IEEE)
345 E. 47th St.
New York, NY 10017
(212) 705-7900

This is a large academic and professional organization that produces many publications and sponsors many conferences. It also participates in the development of standards, including computer graphics standards. (See the section entitled “Standards” in this guide.) Additional information, including ordering information, can be found at their World Wide Web site at **<http://www.ieee.org/>**.

Institution of Electrical Engineers (IEE)
Savoy Place
London WC2R OBL
United Kingdom

This is the British counterpart to IEEE, and is the largest such organization in Europe. It has a Computing and Control Division, which is dedicated to computer science and related topics, including computer graphics. It produces the INSPEC database, which includes Computer and Control Abstracts and Electrical and Electronics Abstracts, both of which are listed in the “Indexes and Abstracts” section. They have a World Wide Web site at **<http://www.iee.org.uk/>**.

International Electrotechnical Commission
3 Rue de Varembe
Case Postale 131
CH-1211 Geneva 20
Switzerland
22/919-0211

This body, composed of national committees from throughout the industrial world, is charged with developing international standards in the fields of electrical and electronic engineering. Basic information about the commission is available on their World Wide Web site at **<http://www.iec.ch/>**.

International Organization for Standardization (ISO)
1 Rue de Varembe
Case Postale 56
CH-1211 Geneva 20
Switzerland
22/749-0111

This is the international counterpart of the American National Standards Institute (ANSI). It issues many computer graphics standards jointly with ANSI. You can find complete, detailed information at their World Wide Web site at **<http://www.iso.ch/>**.

National Computer Graphics Association

2722 Merrilee Dr., Ste. 200

Fairfax, VA 22031-4499

(703) 698-9600

(800) 225-NCGA

This is a general organization for persons and organization that use or are interested in computer graphics. It sponsors an annual computer animation competition.