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Encyclopædic Knowledge

By Walter Alan Zintz.

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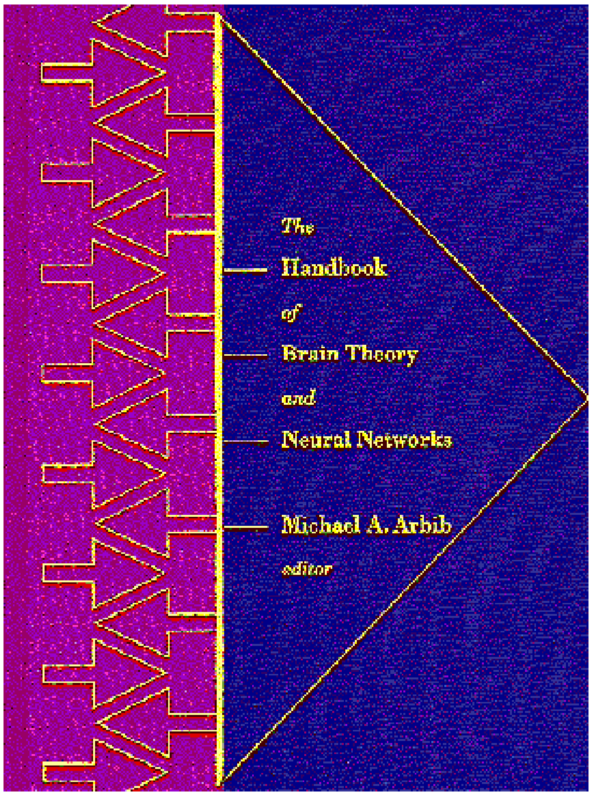
To start the new year with a splash, I'm reviewing books that attempt to elucidate every significant aspect of their subjects. At least one of them come close to achieving that goal.

The Handbook of Brain Theory and Neural Networks



Edited by Michael A. Arbib. Includes: diagrams, equations, bibliographies, contacts, 4-page Table of Contents, 44-page index. 1118 pages, hardbound, ISBN 0-262-01148-4, $175.00. Published by MIT Press: (800) 356-0343, mitpress-orders@mit.edu.

Reader Level: computing--professional to theorist, subject--newbie to theorist.
Information: concepts--excellent, practice--good.
Readability: textbook--excellent, reference--spectacular.
Summary: Neural principles illuminated under 266 sharply-focused microscopes.

If you're serious about neural programming, you need to know how real, organic neural systems work, and in detail. This is the book that can tell you from every viewpoint: mathematical, biological, philosophical, etcetera. I can't think of anything that the most ambitious neural programmer needs to know about brains and neurons that isn't covered here; and there's a lode of information about computing and datacomm aspects, too. Don't be fooled by the page count--these are 8-inch by 11-inch pages, each holding up to 1300 words of text.

But plenty of other professions have an interest in this subject, from mathematicians to medical researchers to linguists to psychologists. To make this book lucid to all these groups, the editor boldly decided to make every topic informative to readers working in the topic's area, but still clear to those from other technical backgrounds. The way he went about this is chiefly responsible for the book's marvelous accessibility.

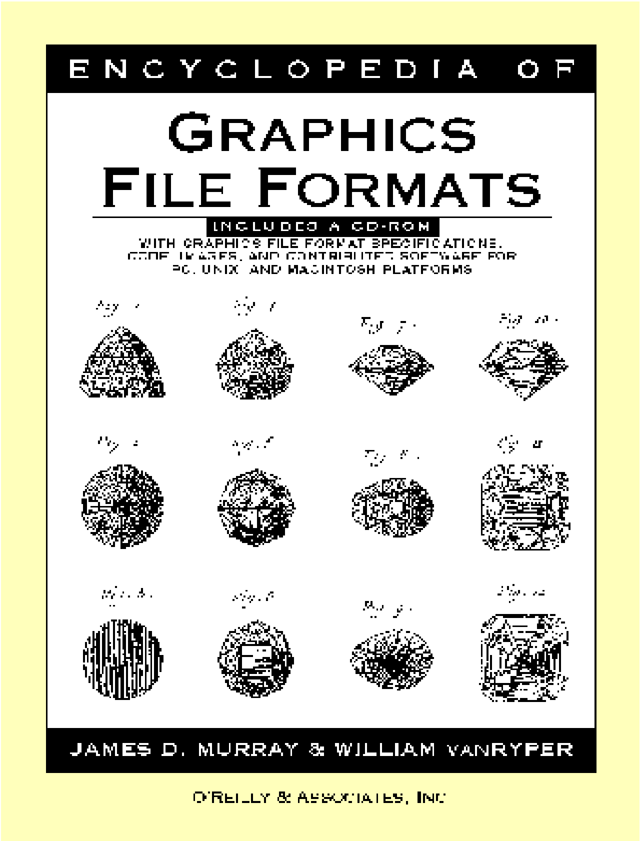
First he and his editorial board found specialist experts to write each chapter, at or near a state of the art level. Yes, this book consists of articles by separate authors, but it definitely is not just a roundup reprinting of technical papers. All the chapters were written especially for this volume, authors were held to a very specific style guide, and each author or team obviously knew generally what the other authors were doing.

Then Arbib sat down to write a large set of introductory pieces for the overall volume. They begin with three articles introducing neural science and technology from the start; they're complete in themselves but loaded with cross-references to the main articles. Then come 23 ''road maps'' in eight categories. Each of these articles discusses how to read the book as a tutorial on one specific aspect of neural science, with a list of relevant articles and a suggested order for reading them. All this is entirely independent of the conventional (and thorough) Table of Contents and index.

The 266 content articles can each be read at several levels of depth. They're designed so that reading just the introduction and conclusion will give a good summary of the subject. Next in depth comes the full article. For a still deeper look, there are numerous cross-references to other articles in this volume. For readers willing to look beyond these pages, each article ends with a bibliography, typically 12 to 15 items, with markings to distinguish the broad works from the technical papers that focus on a particular breakthrough discovery. Finally, the list of authors near the end of this book gives e-mail addresses for almost everyone, and that looks like an invitation to send them queries.

The one sticky point with this book is mathematics. Some articles get by without using any math, and many others stick to college algebra and/or basic calculus. That still leaves a lot of articles with main bodies--not introductions and conclusions--that (usually of necessity) get into pretty advanced mathematics and statistics, and can't be comprehended by readers who can't keep up with the functions and equations.

Encyclopedia of Graphics File Formats



By James D. Murray and William vanRyper. Includes: CD-ROM, example code, bibliographies, tables, 20-page glossary, contacts, 9-page Tables of Contents, 16-page index. 894 pages, paperbound, ISBN 1-56592-058-9, $59.95. Published by O'Reilly & Associates: (800) 889-8969, (707) 829-0515, order@ora.com.

Reader Level: computing--experienced to wizard, subject--newbie to professional.
Information: concepts--passable, practice--good.
Readability: textbook--non-starter, reference--good.
Summary: A huge collection of information on a long list of image data formats.

Starting at the bottom, early chapters of this book are a simple tutorial on the basics of storing and transferring graphic images. The technical level is fairly low, and the authors' writing ability is passable. The authors' intention here is evidently to give the readers just enough background to understand what the elements within graphics file formats are supposed to be accomplishing. These chapters hit that goal in general, without getting overly technical.

The book's heart consists of individual chapters on around a hundred file formats that are designed (or often used) for graphic images. The selection of this hundred is eclectic--they range from mainstream workhorses, to technically advanced formats rarely seen outside their own tightknit user communities, to toy-computer specialties. Each chapter starts out gloriously, with a concise table listing a lot of basic information under these headings:

- Name
- Also Known As

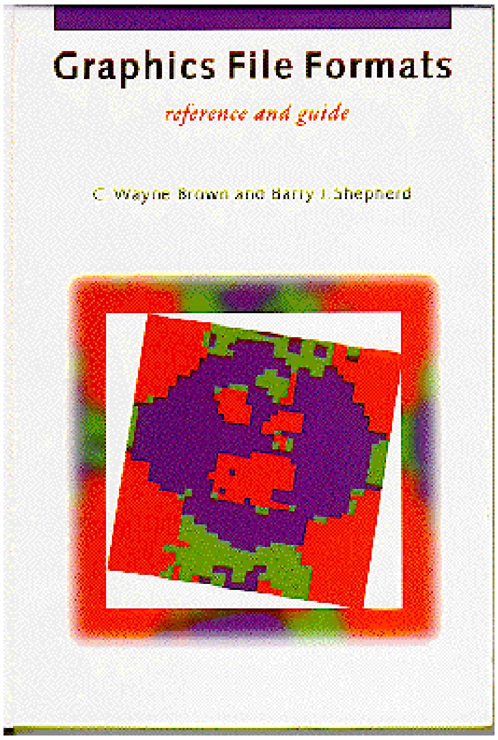
- Type
- Colors
- Compression
- Maximum Image Size
- Numerical Format
- Multiple Images Per File
- Originator
- Platform
- Supporting Applications
- Specification on CD
- Code on CD
- Images on CD
- See Also
- Usage
- Comments

The chapter bodies are a grab-bag. Many give extensive explanations of their formats that are ample to understand how a format works, although hardly ever enough to let the reader start writing files. Some have almost no information: at times because the authors claim that information is not released, at times for no stated reason. Many more are in a middle state, a fair amount of information but not full documentation.

But the good times are back in the bound-in CD-ROM. There the authors have included just about all the public-domain information that was out there to be found. There are official specifications, in states ranging from polished to skeletal, reproduced in the original format and translated to ASCII flat files where appropriate (and where the originators permit). There are utilities for use with the various formats. There are even sample image files to play with. (Of course, what you get for a given format varies, from all of the above in quantity to nothing at all, depending on what's out there.) And if you don't have a CD-ROM drive, the book will tell you how to pick up many of these files over the Internet.

So don't buy this book to learn about one or a few file formats, unless you've looked a copy over carefully to be sure it has real information available on the format(s) you have in mind. But if you need a reference manual on the shelf to help you deal with any file format you may unexpectedly encounter, this could be your best choice. For most formats it has as much information as is available to the public without paying a fortune. It's fairly well cross-referenced, except that the pages in the Tables of Contents are out of order. And the CD-ROM is accessible from the main PC operating systems as well as from Unix.

Graphics File Formats: Reference and Guide



By C. Wayne Brown and Barry J. Shepherd. Includes: Diagrams, tables, equations, contacts, 2-page bibliography, 4-page Table of Contents, 8-page index. 472 pages, hardbound, ISBN 1-884777-00-7 (Manning) or 0-13-303405-4 (Prentice Hall). Published by Manning Publications, distributed by Prentice Hall.

Reader Level: computing--experienced to wizard, subject--newbie to professional.
Information: concepts--excellent, practice--good.
Readability: textbook--good, reference--good.
Summary: A short course in image representation, with format information thrown in.

Despite the misleading title, this book is primarily an intensive introduction to the theory (and high-level practice) of image representation. The concepts you'll need to deal with file formats are here; so is a lot else in the graphic image field. For example, the chapter on color discusses the inherent limitations of all color representation methods, the theory of color vision, and quite a bit more that isn't directly relevant to image-file formats.

In this arena the book is a fairly good one. The writing is reasonably clear, there are plenty of visuals to clarify things, and the pace is about right for technical people who know some advanced math. The high thought to word ratio means that the digressions don't take space away from the theory that will make file format matters easy to grasp.

But the book's ''appendixes'', which occupy more than a third of its pages, deal with format specifics on a format-by-format basis. More than fifty formats are covered, and they are formats a working computer professional is likely to be involved with. Each format's ''appendix'' is laid out in tabular style, with the information presented under a long list of categories. (These categories won't be very lucid to you, though, until you've used this section several times.) Typically, the information for a format makes it's working principles clear, and is probably enough to start reading files in that format.

But the appendixes are not intended to replace the official specifications, of course.

The authors did not work as an ordinary collaborative team. In this case, one of them started the book; the other came along later to finish it. It's a tribute to them both that the book doesn't have the glaring ''seams'' between the two writers' work that this writing approach would suggest--to a reader it all looks like one unified whole.

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