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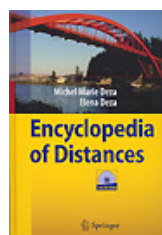
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Encyclopedia of Distances

Michel Marie Deza and Elena Deza



Publisher: Springer (2009)
Details: 590 pages, Hardcover with CDROM

Price: \$229.00
ISBN: 9783642002335

Category: Handbook
Topics: Mathematical Modeling, Metric Spaces

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[See the table of contents](#)

MAA Review

[Reviewed by Bill Wood, on 09/25/2009]

Michel Marie Deza and Elena Deza's *Encyclopedia of Distances* is exactly what it says it is — an encyclopedia of topics that relate to measuring distance. It is written in an encyclopedic format, consisting mostly of bulleted lists of concepts with no significant narrative. There are no exercises or proofs.

The text is divided into seven parts, with the organizational strategy moving roughly from the abstract to the concrete. The first part of the book covers important concepts in and near the study of metric spaces in general, including metric-like structures, topological separation axioms, and several metric invariants. The remaining parts are inventories of metrics in various areas of mathematics, science, and other fields. This begins with several metrics in classical geometry, then proceeds to applications of distance in fields like algebra and probability, eventually working through applied mathematics, computer science, physics and chemistry, social science, and even art and religion.

The book is at its best when it stays within mathematics. The entries are terse but clear, primarily featuring definitions and sometimes a few comments on significant properties and connections to other entries. It is a convenient, interesting, and unique reference of mathematical ideas that are not often found together. In the later chapters, where the entries get more applied, the content becomes more difficult to penetrate without some background in the corresponding areas. Some of the entries, particularly in the less mathematical fields, amount to listing some things that people like to measure. The authors arguably may have been a bit overzealous in their effort to inventory all things distance, but this applies to relatively small portion of the book.

Needless to say the bibliography is extensive, but the authors concede in the preface that an appropriate citation for every definition would be an impossible task. I was thus frequently left with the experience of discovering an interesting entry but having no direction on where to go for more. The authors vaguely refer the reader to the internet for more information, which points pretty well to how this book should be used. It is a handy reference for forgotten facts and a starting point to learn about new ideas, but it is ultimately the reader's responsibility to find the right sources.

Encyclopedias in general have evolved considerably in the digital age, specifically with the advent of hypertext to accommodate their inherently non-linear nature. The *Encyclopedia of Distances* references itself frequently, so it is very convenient that

the book is packaged with a digital copy on CD-ROM. The disk contains the entire text in Adobe's ubiquitous portable document format (pdf) with all references hyperlinked to the appropriate section of the main text or the bibliography. There is no additional content on the disk, just additional convenience.

Encyclopedia of Distances is a highly peculiar book. It is a truly original compilation of material, one that almost anyone with some mathematical experience might enjoy browsing. Geometers will find it a nifty reference, but the extent to which a more general audience may see it as a useful source rather than a novelty is difficult to (*ahem*) measure.

Bill Wood is a Project Next fellow (sun dot) and Visiting Professor of Mathematics at Hendrix College in Conway, Arkansas.

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