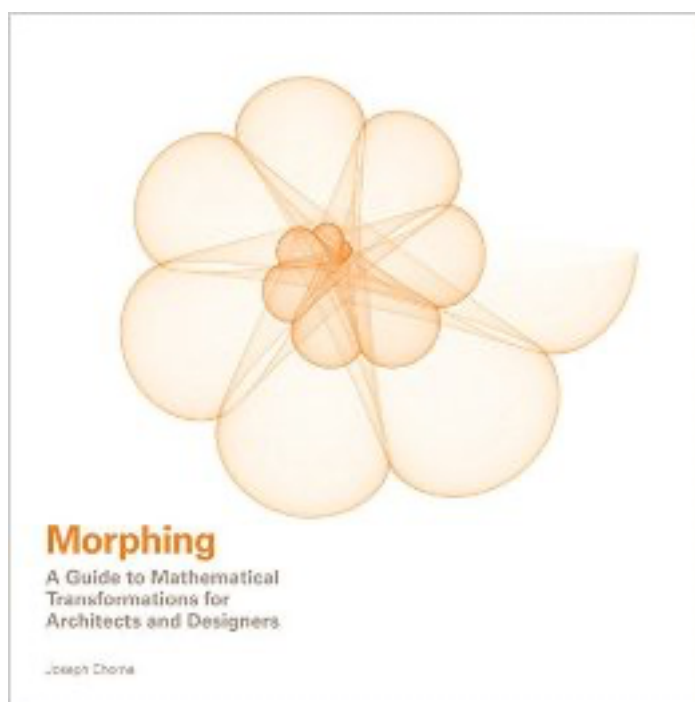


Morphing: A Guide to Mathematical Transformations for Architects and Designers

by Joseph Choma. Laurence King, February 2015. 232 p. ill. ISBN 9781780674131 (cl.), \$50.00.

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Architectural design books that tackle the tough problem of the relationship of mathematics to architecture are few and far between. Even less frequent are those titles written in a clear and concise manner that then makes them easy to use.

The relation of geometry to design was introduced by writers like Matila Ghyka. Mario Salvadori, best known for his books on structures, delved broadly into the theme of Mathematics in Architecture. Years later, Architectural Geometry, furthered this discussion with a textbook by Helmut Pottmann, Andreas Asperl, Michael Hofer and Axel Kilian on geometric computing

and its uses in architectural design.

Less wordy and much simpler in format, *Morphing: A Guide to Mathematical Transformations for Architects and Designers* addresses trigonometry as a tool in architectural design. As visual learners, architects think in images not formulas, making *Morphing* an ideal resource. This book is more or less a catalog of forms and the corresponding formulas. The book begins by introducing the underlining principles of trigonometry. Choma considers this book to be a pedagogical guide which teaches through instructional frameworks. The student is introduced to the theme of transformation- shaping, translating, cutting, rotating, reflecting, scaling, modulating, ascending, descending, spiraling, texturing, bending, pinching, flattening, and thickening shapes. The next sections of the book show how to combine transformations and

then shapes.

Perhaps the most interesting part of the book is the section that discusses analyzing. This is essentially a precedent study or a "generative mechanism" as Choma suggests. Five works by different designers are shown, beginning with Shigeru Ban's Japan Pavilion. Choma provides the "recipe" for the design, with graphic details of each of the elements and their mathematical formulas. In Acconci Studio's Mur Island study, Choma describes how scaling is used, followed by ascending and cutting techniques. NOX's work indicates the use of texturing as does that of Arata Isozaki's Ark Nova concert hall. Essentially the case studies serve to show how trigonometry can be used to create innovative and imaginative architectural designs.

The final section describes what the author calls "developable surfaces" -- taking a plane and transforming it into a cylinder or a cone. Mathematical formulas here again are tied to the visual images of the forms. The book concludes with a chapter entitled "Assumptions" wherein Choma reminds readers: "The choice of which tool to use determines which procedures can be followed" (p. 223).

Choma includes a description with how he developed the book and a bibliography comprised of basic but often theoretical titles. He ends by stating that he "let the equations and shapes be the primary text" (p. 231). That intentional choice makes the books easy to use and a real asset for the architectural designer.