Review

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A computational approach to digital Chinese painting and calligraphy (1st ed.)
Xu S., Lau F., Pan Y., Springer Publishing Company, Incorporated, 2009. 380 pp. Type:
Book

Date Reviewed: Sep 18 2009

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Sparked by their recent research efforts, the authors of this text view themselves as being on a mission to explore digital art--that is, art that is created on or by a computer. They encourage aspiring modern artists to use nouveau technology, such as computers, instead of more traditional artistic approaches. In this manner, computer scientists can further the pervasive computing movement to include domains that have not been extensively cultivated with computer technology. This book is quite innovative in its perspective of how the brushstrokes necessary for Chinese calligraphy can be traced in paintings. Anecdotally, the authors use the enthusiasm for the 2008 Beijing Olympics to encourage spectators to study Chinese arts, too.

The text is divided into six parts. Parts 1, 2, and 6 present introductory, survey, and concluding perspectives (or, as the authors put it, "final fantasies"), respectively, that explain the scientific and mathematical approach used throughout the book. These parts also explain why many of the figures depict various geometric primitives and models of system architectures. Part 1 (chapter 1) introduces the relationship between computer science (CS) and fine art. It defines digital art, giving varied examples of this field and explaining why its creation tends to be computationally challenging. Part 2 (chapter 2) delves into current research technologies that enable paintings to be interactively and automatically generated by computers. This forms the context of the authors' computational approach to digital Chinese painting and calligraphy.

Part 3, "Interactive Digital Painting and Calligraphy," Part 4, "Automatic Generation of Artistic Chinese Calligraphy," and Part 5, "Animating Chinese Paintings," comprise the bulk of the book, consisting of chapters 3 to 11. Part 3 develops a software system for interactive support, Part 4 analyzes artificial intelligence (AI) techniques for generating calligraphy, and Part 5 combines all of the above with computer graphics, to create animations of Chinese paintings. These chapters are extensions of the authors' previously published work, including papers from *IEEE Intelligent Systems*, *ACM Transactions on Graphics*, and the Eurographics and Association for the Advancement of Artificial Intelligence (AAAI) conferences. Part 6 concludes with chapter 12, "Final Fantasies for Digital Painting and Calligraphy."

The target audience for this book spans the gamut. On the one hand, the book teaches graphic art--albeit through a scientific medium. On the other hand, it relies heavily on modern computational technologies and scientific research. The authors hope that both the art and science communities will be interested in the book's topics, and that a new community will emerge that explores the nexus of these formidable disciplines. In practical terms, this book can be used as the primary text of a specialized course on digital art or as supplementary reading material for advanced courses in related disciplines. The reader should be aware that the foundations of the parametric models considered in the research rely on sophisticated mathematics that is not readily accessible to everyone. However, even in this case, the book can serve as an important reference text on the subject matter.

Xu, Lau, and Pan nicely present a major computational approach in the field. This is one of the important texts in the current literature on these topics.

Reviewer: Minette Carl   Review #: CR137309

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