


RASTER IMAGING AND DIGITAL TYPOGRAPHY II



Edited by
Robert A. Morris & Jacques André

THE CAMBRIDGE SERIES ON ELECTRONIC PUBLISHING

Contents

RIDT91 conference	vii
-------------------------	-----

Robert A. MORRIS and Roger D. HERSCH	
Preface	ix

Outlines

Jakob GONCZAROWSKI	
A Fast Approach to Auto-tracing (with Parametric Cubics)	1
Richard SOUTHALL	
Character Description Techniques in Type Manufacture	16
Erik VAN BLOKLAND and Just VAN ROSSUM	
Different Approaches to Lively Outlines	28
Gerrit NOORDZIJ	
The Shape of the Stroke	34

Grayscale

Avi C. NAIMAN	
CRT Spatial Non-linearities and Luminance Linearization	43
Gideon AVRAHAM and Vaughan PRATT	
Sub-Pixel Edge Detection in Character Digitization	54
Joyce E. FARRELL	
Grayscale/Resolution Tradeoffs in Image Quality	65

Halftones

Youlu ZHENG	
Subdivision-Remainder Method for Converting Spatial Resolution to Intensity Resolution	81
Theophano MITSA, Robert ULICHNEY, and Kevin J. PARKER	
The Construction and Evaluation of Halftone Patterns with Manipulated Power Spectra	90
Isaac AMIDROR	
The Moiré Phenomenon in Color Separation	98

Craig C. COOK	
Color Digital Halftoning Using Multi-Cluster Halftone Dots	120

Non-European type

Ittai TAMARI	
Decipherability, Legibility and Readability of Modern	
Hebrew Typefaces	128

Charles ROSENBERG	
A Low Complexity Method for Compressing Kanji Font Bitmaps	137

Hiroshi ABE, Yoshimichi YAMAMOTO, and Yoshio OHNO	
High Quality Gray-Scale Kanji Font Generation Using Automatic	
Stroke Displacement	147

DONG Yunmei and Li Kaide	
A Parametric Graphics Approach to Chinese Font Design	156

FAN Jianping	
Towards Intelligent Chinese Character Design	166

Rendering

Marc CORTHOUT and Evert J. POL	
Supporting Outline Font Rendering in Dedicated Silicon:	
the PHAROS Chip	177

Roger D. HERSCH and Claude BÉTRISEY	
Advanced Grid Constraints: Performances and Limitations	190

Pierre A. MACKAY	
Looking at the Pixels. Quality Control for 300 dpi Laser Printer	
Fonts, Especially METAFONTS	205

Appendix

Jacques ANDRÉ and Robert A. MORRIS	
Colophon	216

List of authors	218
Index	219

Colophon

Robert MORRIS[†] and Jacques ANDRÉ[‡]

[†] *Univ. of Mass./Boston*

Boston, MA 02125

email: ram@cs.umb.edu

[‡] *Irisa/Inria, campus de Beaulieu*

F-35042 Rennes cedex, France

email: jandre@irisa.fr

This book has been made using the same processes as the previous *Raster Imaging and Digital Typography* conference proceedings [André & Hersch 89]:

1. Authors received structural guidelines from the editors.
2. Following these guidelines,¹ authors prepared their papers using various systems (such as \LaTeX , Microsoft Word, DCF, etc.) and sent them to the editors through different channels (email, ftp, floppies, etc.).
3. The editors translated this heterogeneous material to \LaTeX files using a single style².
4. Papers were proofed using an Apple LaserWriter at 300 dpi, and the editors made minor spelling and grammatical changes to make the presentations conform to American English usage.
5. The final corrected papers were run through \LaTeX and the output was converted to PostScript and transferred to a Linotronic typesetter to produce high resolution bromides.
6. Finally, some figures were pasted on the bromides (this occurred only for the few figures for which it was impossible to generate Encapsulated PostScript, such as low resolution images (e.g. pages 202, 210) or special device output (e.g. page 86). All others were electronically pasted by the inclusion of Encapsulated PostScript supplied by the authors.

The '89 Proceedings were produced by editors all in Europe who could meet in person to argue matters of style and presentation. For this work, we struggled under the minor inconveniences of transatlantic electronic cooperation—Internet file transfer problems, time zone differences which sometimes made “debate” last days, etc. Of greater significance is something completely new in this book: we have used fonts from the Lucida family. This font was designed by Charles Bigelow and Kris Holmes [Bigelow & Holmes 86] with a variant specifically for medium resolution devices. The family has several advantages:

1. Lucida fonts seem to reproduce very well ([Bowden & Brailsford 89]).

¹As editors, we are glad to thank the authors, all of whom abided by the guidelines.

²This style, cup.sty, was written by Rick Furuta to conform to requirements of the Series, then slightly modified by several \LaTeX gurus.

2. The family has several closely coupled variants, including a serif, a sans-serif and a typewriter font. Non-latin fonts (such as for Hebrew and Cyrillic) exist as well.
3. Lucida has a math extension font fully compatible with T_EX. This is not true of Adobe Times-Roman, so the RIDT'89 proceedings used *Computer Modern* fonts for formulae while the text was in Times. In this volume, formulae should be harmoniously integrated with the body text.
4. A brighter, narrower variant (*Lucida Bright*) specially designed for phototype-setters is available. It is this variant we used in Adobe Type 1 format to prepare the final bromides on the Linotronic.

We hope that the readers will approve our choices.

Acknowledgments

The editors wish to thank Bigelow & Holmes for supplying the most recent Lucida typefaces, Philippe Louarn and Atelier Irisa for considerable help in making the L^AT_EX style and fonts work, and Ikkon for producing bromides.

References

- [André & Hersch 89] Jacques André and Roger Hersch (eds.), *Raster Imaging and Digital Typography*, Cambridge University Press, 1989.
- [Bowden & Brailsford 89] Paul R. Bowden and David F. Brailsford, On the noise immunity and legibility of Lucida fonts, in [André & Hersch 89], 205-212.
- [Bigelow & Holmes 86] Charles Bigelow and Kris Holmes, The Design of Lucida, in J.C. van Vliet (ed.), *Text Processing and Document Manipulation*, Cambridge University Press, 1986, 1-17.