ELECTRONIC PUBLISHING, VOL. 7(4), 195–196 (DECEMBER 1994)

Editorial

This is a special issue of *Electronic Publishing* on computer processing of type. Previous contributions in this field may be found in the *Raster Imaging and Digital Typography* conference proceedings, published by Cambridge University Press in 1989 and 1991 and in the more recent 1994 RIDT conference proceedings published as Volume 6 Issue 3 of EP-odd. During the years 1986 to 1991, digital typography was mainly concerned with digitization and rendering of fonts at low and medium resolution. At that time, systems for document entering, formatting, visualization and printing had to be created. One of the critical bottlenecks was the quality of scalable display and printer fonts. Once these basic problems were solved, research went on to more subtle themes such as optical scaling, creation of interpolated fonts, synthesis of fonts for Oriental and Asian languages as well as more advanced computerized font acquisition, design, synthesis and transformation tools.

The present special issue of EP-odd is focussed on *Character Shapes as Computer Objects*. In manuscript writing, character shapes were created individually one by one according to the movement of the scriptor's hand. With the invention of movable type, character shapes became solid objects. Variations in character shapes could only be obtained by explicit creation and production of new different typefaces. With the advent of the computer, typefaces became geometric objects described by mathematical functions. Computer manipulated typefaces described by their geometry may potentially regain the flexibility that is characteristic to handwriting. Such a flexibility is required in order to solve problems related to dynamic typesetting, i.e. assembly of character parts into full-blown characters, ligatures, mathematical formulae and optical scaling.

METAFONT, invented by Donald Knuth, was the first computer language created for type design. It provides features for meta-design, i.e. for automatically creating character variants such as oblique and bold letters of different weights. As a modular programming language, it offers facilities for defining separate character sub-parts and for assembling them into full-blown characters. Yannis Haralambous is one of the few experts using METAFONT as a tool for producing digital fonts for Oriental and Asian languages. In his contribution he develops a rather complete solution for the generation of a *Khmer script*.

An attempt to find solutions for solving the difficult problem of *font ligatures* is described by Michael Kokula. The method he develops for creating high-quality ligatures is based on the synthesis of smooth centerlines connecting character ends.

Jacques André and Irène Vatton aim at improving the quality of typeset *mathematical formulae* by synthesizing high-quality mathematical signs as a function of the place taken by the enclosed mathematical expression. For this purpose, they analyze the relative weights of traditional hot metal characters and symbols at different sizes. They try to deduce the rules describing the evolution of the symbols' shapes at increasing sizes. By applying these rules, they synthesize mathematical symbols of improved quality.

Since most existing digital characters are given by a geometrical description of their contours, tools must be developed to automatically identify character sub-parts such as stems or serifs and to extract characteristic points such as extremal and junction points

CCC 0894–3982/94/040195–02 *Received 3 November 1994*

from the character outlines. Jacky Herz follows this approach by proposing a general-purpose font-independent algorithm for identifying and automatically grid-fitting stems.

The present contributions show that this research field is wide open for those who would like to combine computer science and aesthetics. There is room for further innovations by making intelligent use of the potential offered by computer-driven character shape processing. I would like to thank all the contributors to this special issue of EP-odd and encourage them to pursue their research in this challenging field.

ROGER D. HERSCH, GUEST EDITOR