

Editorial Comments

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I am very pleased to introduce this special issue, devoted to Hán Thế Thành's dissertation, "Microtypographic extensions to the \TeX typesetting system", submitted to the Faculty of Informatics, Masaryk University, in Brno, Czech Republic, in fulfillment of a requirement for the Ph.D. degree.

Thành, as most readers of *TUGboat* will know, is the creator of pdf \TeX , an extended implementation of \TeX that can generate pdf output directly as an alternative to `dvi`.

pdf \TeX

The first steps toward what would become pdf \TeX were introduced to TUG'96 in Dubna, Russia [8] by Petr Sojka. Response to the presentation was enthusiastic: the paper was awarded the UK \TeX Users Group's Cathy Booth memorial prize. The promise of this work was that it addressed the future—"Publishers are moving towards the art of creating *electronic* documents."

A pdf \TeX discussion list [7] was established in March 1997, and has been a lively forum ever since. Thành has been an active participant in most of the discussions and, until he returned to Vietnam, his response to bug reports and suggestions was prompt and thorough; since leaving Brno, however, his e-mail connection has been unpredictable.

The next installment in the saga was the appearance of the first user manual [5]. The name of the program was now firmly established as pdf \TeX , and the output could be switched from `dvi` (the default, which would become `trip`-worthy a short time later) to `pdf`.

pdf \TeX was accepted as Thành's master's degree project; on this firm basis he has experimented further with many nuances of fine typography.

One such experiment was reported to TUG'98: "Improving \TeX 's Typeset Layout" [6]. In this paper, a technique is described for adjusting interword spacing after paragraphs have been broken into lines. Quoting from the abstract:

Instead of changing only the interword spacing in order to justify text lines, we also slightly expand the fonts on the line as well in order to minimize excessive stretching of the interword spaces.

This technique is reminiscent of the approach used by the *hz*-program [9] invented by, and named for, Hermann Zapf. In this program,

[Zapf] and URW wanted to reinstate in the age of computers that which Johannes Gutenberg had achieved five hundred years ago; namely, a justified setting of text with equal inter-word spacing and optically straight margins. Such setting could be achieved only by hard work until the present.

In October 1992, at the annual Goudy Award presentation at the Rochester Institute of Technology, Peter Karow of URW spoke on the *hz*-program. Thinking that I recognized the basic paragraphing strategy, I asked him after his talk what he had based this on. His reply: " \TeX , of course!" Here was a demonstration, from the "traditional" typesetting community, that \TeX 's line-breaking algorithm not only yields output of high quality, but also provides a sound basis for further improvements.

This is the area which Thành chose to pursue for his doctoral research.

Digression

Independently from the microtypography investigation, work continued on pdf \TeX . Others besides Thành contributed actively to the project through the discussion list, and their own independent projects. One of the most active and dedicated participants in this has been Hans Hagen; his Con \TeX t system, grounded solidly in pdf \TeX , adds interactivity and many new ways of looking at \TeX as a back end for development of on-line documents, rather than as an end in itself to produce typeset copy for publication. This tool resulted in several papers presented at TUG'98 [2-4] (the first two of these were awarded the Cathy Booth prize for best paper), and another at the Polish \TeX group, GUST's, 1999 meeting in Bachotek [1].

The dissertation

In his research, Thành examined many different points of view regarding the interaction between fonts and composition techniques. The regularity of spacing in Gutenberg's 42-line Bible and the mechanism by which this effect was achieved were important influences. Hermann Zapf's analysis of this mechanism, the use of the same letterforms in different widths, became a key component of Thành's project. Developing algorithms to determine what kinds of adjustments might be necessary and carrying them out on the fly form the core of what is described here. All this must be done without the reader being aware of what has happened.

The completed project was submitted in October 2000. The examination comprised two sections: competence in the chosen field, computer science,

and review of the dissertation project. Among the examiners for the first section were Petr Sojka and Jiří Zlatuška, both of Masaryk University, and both active in TUG. The dissertation committee included Hermann Zapf and Hans Hagen. Donald Knuth also reviewed Thành's samples and sent a nice 10-page letter with comments.

The pages that follow will demonstrate that the degree was well earned.

Production of this issue, and acknowledgments

The pages of the dissertation that follow are images of the actual dissertation as submitted. They have been embedded as pdf code into pages framed in the *TUGboat* format. A separate running footer has been included to carry the original page numbers, in case of internal page references.

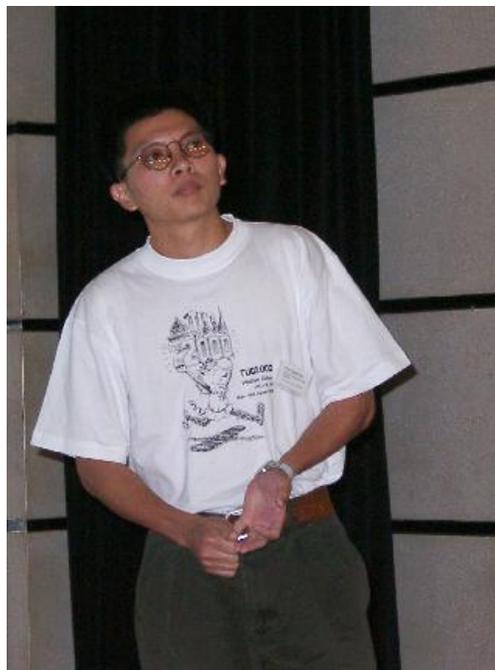
The work of creating this format was accomplished by Hans Hagen, to whom we offer our warmest thanks. As might be guessed, he performed this feat using ConT_EXt. Hans has agreed to work with the *TUGboat* production team to create a ConT_EXt author package, but we don't have a schedule for this yet.

Of course we are grateful to Thành for permitting us to reproduce his work, and to all who supported him in bringing it to completion. Thành has returned to Vietnam, and we wish him the very best — we hope that he is able to make good use of the knowledge he has gained. Although his e-mail connection is uncertain, we know that he will want to return to participation in the pdfT_EX list [7], so please stay tuned.

References

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- [2] Hans Hagen, “The calculator demo, integrating T_EX, METAPOST, JavaScript and PDF”, *TUGboat* **19** (1998), No. 3, pp. 304-310.
- [3] Hans Hagen, “Visual debugging in T_EX, Part 1: The story”, *TUGboat* **19** (1998), No. 3, pp. 311-317.
- [4] Hans Hagen, “Visual debugging in T_EX, Part 2: The macros”, *TUGboat* **19** (1998), No. 3, p. 317.
- [5] Hán Thế Thành and Sebastian Raetz, “The pdfT_EX user manual”, *TUGboat* **18** (1997), No. 4, pp. 249-254.
- [6] Hán Thế Thành, “Improving T_EX's Typeset Layout”, *TUGboat* **19** (1998), No. 3, pp. 284-288.
- [7] pdfT_EX discussion list; subscriptions to the list can be entered, and the archives viewed, at <http://tug.org/mailman/listinfo/pdftex>.
- [8] Petr Sojka, Hán Thế Thành, and Jiří Zlatuška, “The joy of T_EX2PDF — Acrobatics with an alternative to DVI format”, *TUGboat* **17** (1996), No. 3, pp. 244-251.
- [9] URW Software & Type, “*hz*-program: Micro-typography for advanced typesetting”, URW Software & Type GmbH, Hamburg, Germany, 1993

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Hán Thế Thành at TUG 2000
photo by Alan Wetmore.