

Events and Sightings

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Users Group Celebrates Major Anniversary of TeX

The 32nd anniversary of TeX was celebrated at the TeX Users Group (TUG, <http://tug.org>) annual conference on 28–30 June 2010 at the Sir Francis Drake Hotel in San Francisco. Because of the significance of this anniversary ($32 = 2^5$), TeX's inventor Donald Knuth participated in the celebration.

Don (as he is widely known) Knuth revolutionized typesetting when he released his TeX typesetting and Metafont font-design systems in 1978.¹ Knuth was motivated to create the first high-quality, mathematically based typesetting system by disappointment with the typesetting from his publisher for the revised version of volume 2 of his magnum opus *The Art of Computer Programming*. Being a meticulous man, he carefully analyzed volumes of the *Transactions of the American Mathematical Society* starting in 1900. He presented his results on 4 January 1978 in the renowned annual invited Josiah Will Gibbs Lecture (<http://www.ams.org/meetings/lectures/meet-gibbs-lect>), showing the decline in typesetting quality over the years and how more mathematically based typesetting could regain the lost quality.² Through this presentation, he began engaging the worldwide mathematics community with TeX.

In 1982 Knuth released significantly improved versions of TeX and Metafont. As with everything he does, Knuth provided comprehensive documentation of his work, resulting in the publication of his five volume *Computers and Typesetting Series*³ and his collected papers on digital typesetting.⁴

From the outset, Knuth had made it possible for other developers to build features on top of his systems, and in 1990, Knuth stopped active development of TeX and Metafont. He explained:

My work on developing TeX, METAFONT, and Computer Modern has come to an end. I will make no further changes except to correct extremely serious bugs. I have put these systems into the public domain so people everywhere can use the ideas freely if they wish.⁵

In the years since, TeX and Metafont have greatly influenced features now (or soon to be) found in various commercial and open source typesetting and word processing systems. A large worldwide development and support community has continued to build on top of Knuth's specific TeX and Metafont systems. The derivatives of TeX and Metafont remain among the most stable, flexible, powerful, multilingual, and

high-quality typesetting systems available (and available without payment) and are used in all fields of publishing and academic activity.

The recent annual TUG convention in San Francisco had its typical share of presentations on technical developments, tools to aid or extend use of the TeX systems, and so on. The full list of presentations is available on the TUG website at <http://tug.org/tug2010/program.html>, and videos of all the presentations are available on the River Valley TV website (<http://river-valley.tv/conferences/tug-2010>). However, in keeping with the anniversary and Knuth's presence, there were also more history presentations than usual:

- Walter Gander described writing the first book typeset with LaTeX.
- Chirs Rowley talked more generally about the history of LaTeX.
- Bart Childs (one-time TUG president) described using literate programming (another creation Knuth developed to support the development of TeX and Metafont)⁶ and aspects of the earlier days of TUG.
- John Hobby mused about whether one particular aspect of his design for MetaPost (a derivative of Metafont) had been the correct approach.

Finally, Knuth was joined for a panel discussion (<http://river-valley.tv/tug-2010-panel>) by nine of his Stanford students who helped him develop TeX and Metafont.⁷

- David Fuchs was Knuth's "right hand man for TeX82" and devised TeX's device independent (dvi) output format.⁸
- John Hobby developed the theory and math for Metafont's polygon pens and other aspects of Metafont and later developed MetaPost (<http://tug.org/TUGboat/Articles/tb10-4/tb26hobby.pdf>).
- Frank Liang worked on hyphenation algorithms for TeX, and his TeX82 algorithm is used today by many other typesetting systems (<http://www.tug.org/docs/liang>).
- Oren Patashnik developed the BibTeX system for formatting bibliographies in many standard styles (<http://www.tug.org/TUGboat/Articles/tb24-1/patashnik.pdf>).
- Michael Plass's PhD thesis presented methods for line breaking and pagination with floats that are used in TeX (<http://www.tug.org/docs/plass>).



Figure 1. TUG 2010 conference attendees. (Courtesy of the TeX Users Group (TUG) and Uwe Ziegenhagen.)

- Tom Rokicki developed what has become the principal converter for moving TeX from implementation in Pascal to implementation in C and developed the converter dvips, for moving dvi to PostScript.
- Luis Trabb Pardo was Knuth's "right hand man" for the development of TeX78.
- Howard Trickey did one of the first ports of TeX to Unix and wrote the first four BibTeX styles.
- Joe Weening was involved in various ways in the transition from TeX78 to TeX82.

The last day of the conference ended with a half-hour humorous presentation by Don Knuth on a new modern typesetting system to replace TeX (<http://river-valley.tv/earthshaking-announcement>).

Not surprisingly, a lot of highly precise typesetting and font work was shown during the conference, including a commemorative book⁹ and a piece of embroidery from Knuth with this annotation:

This souvenir TeX lion was embroidered by a numerically controlled sewing machine using the remarkably simple EULER-TRAIL algorithm at www-cs-faculty.stanford.edu/~knuth/programs.html.

A keepsake in honor of TeX's 32nd anniversary, 30 June 2010

TeX remains computer history's longest running open source success story (<http://www.tug.org/TUGboat/Articles/tb24-1/gaudeul.pdf>).

References and Notes

1. D.E. Knuth, *TeX and Metafont: New Directions in Typesetting*, Am. Mathematical Soc. and Digital Press, 1979.
2. D.E. Knuth, "Mathematical Typography," *Bulletin of the Am. Mathematical Soc.*, vol. 1, Mar.1979, pp. 337–372;reprinted in D.E. Knuth, *Digital Typography*, CSLI Publications, 1999.
3. D.E. Knuth, *Computers and Typesetting Series*, Addison-Wesley, 1986: "The TeXbook," vol. A; "TeX: The Program," vol. B; "The METAFONT-book," vol. C; "METAFONT: The Program," vol. D; and "Computer Modern Typefaces," vol. E.
4. D.E. Knuth, *Digital Typography*, CSLI Publications, 1999.
5. D.E. Knuth, "The Future of TeX and METAFONT, TUGboat 11," 1990, <http://tug.org/TUGboat/Articles/tb11-4/tb30knut.pdf>.
6. D.E. Knuth, *Literate Programming*, CLSI Publications, 1992.
7. Historical interviews of seven of these nine panelists are available at <http://tug.org/interviews>.
8. D.E. Knuth, *Computers and Typesetting Series*, part 31 of "TeX: The Program," vol. B.
9. K. Berry and D. Walden, eds., "TeX's 25 Anniversary: An Commemorative Collection," TeX Users Group, 2010, <http://tug.org/store/tug10>.

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