EuroBachoTeX 2007

Michael Guravage

Saturday

Jerzy Ludwichowski, GUST president and conference organizing committee chair, opened the conference by welcoming all the participants, and encouraged everyone to enjoy the proceedings in the spirit of the conference — "Paths to the Future".

Jerzy Ludwichowski

The first speaker was **Jonathan Kew**, who related the history and current status of X∃TEX. After its initial appearance in the spring of 2004 on Mac OS X, a version supporting OpenType fonts appeared the following year. X∃TEX for Linux was announced at BachoTEX 2006, and was quickly followed in June by a version for Windows. This year marked a milestone for the X∃TEX project, in that it became an integral part of TEX Live distribution.

Key features of the current X∃TEX implementation include its native Unicode support, improved integration with existing macro packages and its smart inclusion of hyphenation patterns.

Looking ahead, future releases will support host operating system fonts (OpenType, TrueType and PostScript) with no TEX-specific setup. Another new feature is inter-character tokens — inserting arbitrary tokens in-between adjacent characters based on character classes. This allows one to easily mix scripts and fonts, or insert spacing to stretch text. Finally, to better support non-Latin scripts, minority languages, and scripts not yet in Unicode, X∃TEX will support SIL's Graphite font system.

Taco Hoekwater began his presentation by announcing that MetaPost version 1.0 is now available. New features include file name templates, new color

types, i.e. cmyk, grey-scale and marking-only and an improved manual. To overcome the various size limitations of the current implementation, MetaPost version 1.1 will incorporate dynamic array allocation and provide greater numeric precision. To obviate problems with existing input files, this new version will appear as a separate binary. Finally, in the next year or so Taco anticipates making MetaPost functionality available as a library.

The title of **Hans Hagen's** presentation was "Beware of too much tokenspeak". TEX consumes characters which, in turn, become tokens, and then nodes. Hans gave us a glimpse into how LuaTEX, at the node list level, is simplifying and streamlining previously complex pieces of TEX. So much so that he has been able to retire moderate pieces of existing ConTEXt code. Consistent with the theme of the conference, Hans described how LuaTEX provides a genuine opportunity to embrace the future.

Joanna Ludmiła Ryćko introduced the TEX Clinic. The clinic began last year at BachoTEX, and was open to anyone at the conference seeking relief from a nagging TEX complaint. A number of TEX clinicians were introduced and put at the disposal of the participants.
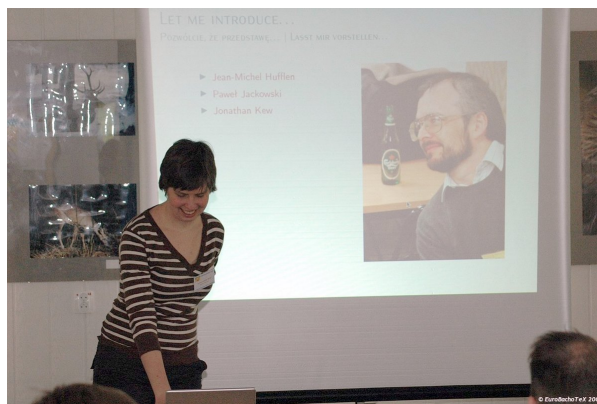
Joanna Ryćko

Johannes Große presented MathPSfrag — a tool that replaces existing labels in Encapsulated PostScript graphics with LATEX generated labels. MathPSfrag extends PSfrag, allowing both automatic and fine grained manual control over label content and placement.

Siep Kroonenberg presented her epspdf conversion utility. Written in Ruby and Ruby/Tk, and using Ghostscript and pdftops, epspdf offers both command line and graphical user interfaces for a round-trip conversion between PostScript and PDF.

EuroBachoTEX 2007 participants. *Not standing, from left:* Siep Kronenberg, David Kastrup, Stanisław Walczak, Jonathan Kew, Grażyna Jackowska, Jerzy Ludwichowski, Ewa Koisar, Joanna Ryćko, Marek Ryćko, Jakub Zdroik, Michał Kolany, Hossam A.H. Fahmy, Mojca Miklavec, Frank Küster, Arthur Reutenauer.

Standing, from left: Włodzimierz Martin, Ewelina Łuczak, Harald König, Małgorzata Łuczak, Stanisław Wawrykiewicz, Wojciech Łukaszewicz, Tomasz Łuczak, Jarosław Brykalski, Ross Moore, Taco Hoekwater, John Trapp, Reinhard Kotucha, Hàn Thế Thành Péter Szábo, Sam Guravage, Michael Guravage, Karel Píška, Hans Hagen, Bram Otten, Bogusław Jackowski, Volker RW Schaa, Agata Wylot, Aleksandra Kaptur, Heiko Oberdiek, Leszek Czerwiński, Marcin Woliński, Jan Ryćko, Marta Wolińska, Grzegorz Murzynowski, Adam Kolany, Radosław Tryc, Dorota Kolany, Norbert Preining, Ferenc Wettl, Andrzej Borzyszkowski, Dorota Cendrowska, Zofia Walczak, Ulrik Vieth, Matrin Schröder, Dag Langmyr, Ewa Szelatyńska, Jano Kula, Karel Horák, Petr Sojka, Deimantas Galčius, Klaus Höppner, Natalia Chlebus, Vytas Statulevičius, Atif Gulzar, Alexander Berdnikov.

Photo by Jacek Kmiecik.

Zofia Walczak demonstrated several basic and advanced features of the Portable Graphics Format (PGF) package. Written by Till Tantau at the Institute for Theoretical Computer Science at the University of Lübeck, PGF is partitioned in three layers: system, basic and front-end. Ti*k*Z is a front-end for PGF. It provides access to all the features of PGF, and is intended to be easy to use. If you look closely you will see it has borrowed part of its syntax from both Metafont and PSTricks.

Norbert Preining stood in for **Jim Hefferon** and described a new 'experimental' procedure for uploading software to CTAN. The workflow includes upload, approve and install steps resulting in TDS compliant bundles. A means for updating package meta-data is also present.

Jean-Michel Hufflen introduced us to XSL-FO, comparing and contrasting corresponding LATEX and XSL-FO structures.

Grzegorz Murzynowski introduced gmdoc, a package for documenting LATEX style files. It differs from its predecessor by emphasising compact 'minimal' markup.

Grzegorz Murzynowski continued by describing his gmverse and gmcontinuo packages. The former provides right alignment for long and broken lines of verse. The latter allows typesetting paragraphs *in continuo*, marked not with a new line and indent but continuously, marked with only the ¶ sign.

In the last talk for Saturday, **Marek Ryćko** argued for a fine, or finer, grained component architecture for TEX functionality. He hopes that focusing on interfaces to facilitate integration will be the tipping point for TEX development.

The weather was clear and cool throughout the week. So it was under the stars and a waxing moon that, later that evening, we enjoyed the annual bon-

Handmade paper projects

Norbert Preining

fire; replete with food, drinks, songs, and of course fire-breathing pyroTEXnics.

Sunday

This year we found the accommodations not quite ready for guests. For instance, there were no curtains and toilet paper was missing as well. It took us a while to find out that all cloth and paper was being used in the "make yourself some paper" workshop given by **Grażyna Jackowska** that ran in parallel to the talks. As the conferences advanced, the participants had to become more careful where they walked because handmade paper was hanging on trees everywhere.

Andrzej Tomaszewski began the second full day of talks by describing the various conditions and limitations he encountered while producing "The Master of Life Arteries of the Greater Warsaw;" a jubilee book for the Warsaw Municipal Water Authority.

Dorota Cendrowska presented several, oft disregarded, design criteria to consider when typesetting enumerations for inclusion in printed text and multimedia presentations.

Jerzy Ludwichowski described his and **Karl Berry**'s work on consolidating the GUST SOURCE and NONSOURCE font licences into the single GUST Font License (GFL). The result is a license that is legally identical to the LaTeX Project Public License (LPPL), which the FSF and Debian already accept as a legitimate free software license.

Jean-Michel Hufflen described how MlBibTEX strives to be a better BibTEX. Starting in 2000, Ml-BibTEX originally was written in C, but has been reimplemented recently in Scheme, a Lisp dialect. Jean-Michel anticipates MlBibTEX's first public release in May of this year.

Next, **Jean-Michel Hufflen** showed how lexicographical order relations are language-dependent, and how MlBibTEX addresses this issue in the context of multilingual bibliographies. Bibliography styles can be unsorted or sorted. However, the `bst` language's sort function is suitable for English only. MlBibTEX uses `nbst` and Scheme, which together allows one to sort European languages in correct lexicographic order.

David Kastrup described how to download, install and use the Emacs AUCTEX package. You can retrieve the latest version of AUCTEX from

`http://www.gnu.org/software/auctex`.

And for the stout of heart, the source code for a pre-release version of Emacs 22 is available from `http://alpha.gnu.org/gnu/emacs/pretest`.

Péter Szabó demonstrated `dvdmenuauthor`, a collection of tools, including pdfLaTeX and xpdf, used to create menus for `dvdauthor` — an excellent low level tool for creating video DVDs on Unix systems.

Norbert Preining described how the Debian "etch" release contains both TEX Live 2005 and teTEX — in parallel — and how both system administrators and regular users can benefit from side-by-side TEX distributions. Norbert concluded with a preview of TEX Live 2007 and further developments regarding TEX on Debian.

The presentation of **Atif Gulzar** and **Shafiq-ur Rahman**, who are from Pakistan, began by explaining how Urdu is used by some sixty million people in twenty countries. Urdu is based on an Arabic script with Nastaleeq as its most prevalent writing style. Nastaleeq is highly contextual — written right-to-left and top-to-bottom. Atif constructed an Omega virtual font containing 827 glyphs, and used Omega external OTPs in a two-pass solution
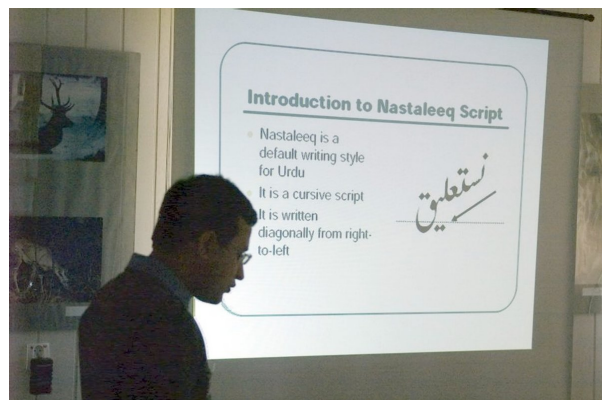
Atif Gulzar

to achieve the appropriate ligature placement and kerning. From the more than twenty thousand valid ligatures in Urdu, Atif was able to correctly render and place a subset of approximately seven thousand ligatures.

Hossam A.H. Fahmy presented his joint paper with **Amir M.S. Hamdy** about their aim to create a font suitable for typesetting the Qur'an. Using examples from existing fonts, he explained many of the problems that one encounters when attempting to digitize a calligraphic script like Arabic. The second part of the talk focused on a detail of that: how to simulate a real-world pen nib in Metafont.

All the news about pdfTEX version 1.40 was brought to us by **Martin Schröder**. Most prominent among the new features are the ability to create compressed object streams, support for JBIG2–encoded images, and the addition of a colorstack à la dvips. The colorstack feature is already in use in the new releases of the hyperref package, and solves the LATEX problem of the text color disappearing at a page break.

Karel Horák walked us through the history of the háček — or caron, if you prefer — in Czech typesetting. He showed us not only an objective historical progression of the symbol shape, but also many forms that occur in actual fonts. Some few he considered good, some more not so good, almost all are apparently simply hideous and out of touch with Czech tradition. The likely cause is that the big font foundries never considered asking a Czech typographer for an opinion.

Hàn Thế Thành also talked mostly about accents, but in this case about the ones used in Vietnamese. The writing system is based on the Latin alphabet, but it has a great many accented characters to denote sounds that are not differentiated in the roman alphabet. His VnTEX package is a complete solution for typesetting Vietnamese, including support for large number of fonts, some of which he created himself.

Hàn Thế Thành

The day ended with two presentations by **Tomasz Łuczak**. The first talk was about the LyX document processor (`www.lyx.org`), the second about how to convert wiki markup into TEX source. Unfortunately, both talks were given in Polish, and even with the simultaneous English translations provided by kind audience members they were hard to follow.

Monday

There were no lectures scheduled for Monday. Instead, we took an excursion to Toruń where we visited the District Public Library–Copernican Library and toured the town. After which we drove on to Chełmno where we enjoyed a scrumptious dinner and music before returning home.

Toruń, situated astride the Vistula (Wisla) river, has been an important regional and trading center since medieval time. A member of the Hanseatic League, Toruń boasted a fleet of one hundred and fifty ships, whose trade allowed Toruń's prosperity to rival that of Brugge, Copenhagen and London. UNESCO designated the Gothic buildings of Toruń's Old Town a World Heritage Site in 1997.

At the Copernican Library we were treated to a sample of the treasures of their collection, including a first edition of Copernicus's "Revolutionibus Orbium Coelestium", or "The Revolution of the Heavenly Orbs", which appeared in print in 1543. Lastly, we were shown a recent reproduction of Gutenberg's Bible. The exemplar is one of 180 copies, matching Gutenberg's original number. Each exemplar was made using the same materials and techniques as the originals, including individual letter variations (font

Gutenberg Bible exemplar at the
Copernican Library

expansion) that Gutenberg used to achieve aesthetic interline spacing.

Our tour of Toruń's Old Town began at the historic Town Hall under a statue of Nicholas Copernicus with the inscription, "He moved the earth, and made the sun stand still". We visited several churches and historical landmarks before ending where we started.

We were running late, so it was late in the afternoon when we arrived in Chełmno, a town located on seven hills, and one of Europe's best examples of defensive architecture. Chełmno's several churches date from the thirteenth and fourteenth centuries. On the fourteenth of February each year, the inhabitants ostentatiously celebrate Saint Valentine's Day since the local parish church has kept the saint's reliquary for many centuries.

After a short stroll through the town, we retired to a local restaurant where we enjoyed a delicious buffet dinner. Entertainment was provided by a group of musicians including Bogusław Jackowski's daughter.

Tuesday

In the first presentation Tuesday, **Hàn Thế Thành** presented a summary of font-related topics in pdfTEX. Some, like font expansion and margin kerning, are already documented in the pdfTEX manual. The rest are scattered across `README` and example files, e-mails and mailing lists. For the first time, all these topics were brought together in one place. Topics include adjusting letter and interword spacing, adding additional kerning before or after certain characters from a font, Unicode support for browser cut, paste and search actions and subfonts — a mechanism for supporting CJK languages.

Our excellent entertainers

Hans Hagen began his presentation by describing the issues driving the development of ConTEXt's font system, namely switching between different font styles and sizes, and proper font handling in math mode. To make font switching easier, ConTEXt can assemble a collection of different fonts into a single structure called a typescript. For example, a typescript might use palatino-regular as the default serif font, palatino-sans as the sans font, courier as the monospace font and euler as the math font. Instantiating this typescript would make these fonts available when using the commands `\rm`, `\ss`, `\tt`, and `$...$` respectively.

Hans Hagen

Hans concluded by describing how the trend toward OpenType fonts, consistent user interfaces and DTP-like functionality will continue to inform where and how ConTEXt controls fonts — and vice versa.

Taco Hoekwater explained how LuaTEX, with its native support for OpenType fonts, will obviate the need for static font metric files. Currently LuaTEX implements a few dozen callbacks at strategic points in TEX. When populated, callbacks will override

TeX's default behaviour with custom code. Taco demonstrated how, when using OpenType fonts, LuaTeX callbacks invoke code that extract the font metric information directly from the OpenType font itself.

Grzegorz Murzynowski identified two differing opinions concerning the TeX & Co. logos. The first group contends that the font is part of a logo, and therefore the combination is inviolate. The second group contends that a logo should be typeset in the same font as its context. For the latter group Grzegorz suggests several slight modifications to the LaTeX logo to make it fit better with various fonts.

Sam Guravage, the youngest speaker ever to address a BachoTeX conference, explained how he uses TeX for all his school assignments. Sam enumerated what he found easy in TeX e.g. sectioning and lists, and what he found difficult e.g. figures and error messages. Sam's conclusion was that TeX makes his work look better, and looking better meant higher grades.

Sam Guravage

David Kastrup began a series of talks by introducing `qstest` — a LaTeX macro package for writing regression tests. The idea is that a user can include a number of tests in his `.dtx` files and use pattern and keyword lists to specify which tests should be run, either when his package is loaded or while running a separate test file through LaTeX. The `qstest` package, together with the `dtx` documentation format and `docstrip`, allows one to integrate unit testing and documentation in a single `.dtx` file.

David Kastrup continued with a discussion of the `makematch` LaTeX macro package. Factored out of the `gstest` package, `makematch` matches patterns with wildcards against a list of targets.

David Kastrup

David Kastrup concluded his series of talks by explaining how the `bigfoot` macro package, originally written as a footnote apparatus for text-critical editions, can benefit the ordinary LaTeX user. For example, default footnote behavior bypasses TeX's global pagebreak optimization whenever a footnote does not completely fit on one page. In contrast, footnote breaks in `bigfoot` are reconsidered for each possible breakpoint of the main text. This means TeX will find the optimum combination of breaks in main and footnote texts.

Robustness, optimization, color continuity and paragraph footnotes are just a few reasons why LaTeX users might consider using `bigfoot` to replace TeX's native footnote apparatus.

Klaus Höppner walked us through the process of creating PostScript Type 1 fonts from Meta-Post sources using MetaType1. Created by Bogusław Jackowski, Janusz Nowacki and Piotr Strzelczyk, MetaType1 is a collection of tools including MetaPost, `t1utils` and AWK; together they are used to generate PostScript Type 1 AFM, TFM and PFB files. Though documentation was scarce, MetaType1 proved to be the correct tool for the job.

Petr Sojka and **Michal Růžička** explained how they generated PDF, HTML and XHTML+MathML output from a single LaTeX source file. While many single-source publishing approaches begin with XML, the amount of mathematics involved made TeX the only viable input format. By enforcing a strict separation of form and content, and modifying the TeX4ht sources, the authors were able to realize individual workflows for each output format.

Péter Szabó reflected on his experience compiling various conference proceedings — including those of last year's EuroTeX conference. Péter described

how the judicious use of procedures and tools can clarify and simplify the work of authors, editors and printers. Revision control software, mailing lists, shell scripts, utilities, instant messaging and of course TeX, can be combined to realize effective publication workflows.

David Kastrup described DocScape Publisher, an XML-oriented database publishing system from QuinScape GmbH. At its core, DocScape uses LaTeX, pdfTeX, and David Carlisle's xmltex. Current applications include financial reports, a variety of product catalogs, and online excerpts.

Karel Píška described procedures and programs he has developed for comparing and viewing font elements. His workbench can be downloaded from
 `http://www-ep.fzu.cz/ piska/tfcpr.html`.
From this set, Karel demonstrated several tools:

cprpk, cprpkt1, cprpkt1c, cprticpk, cprpkpk: tools for comparing two bitmapped representations of a glyph pair at two different resolutions.

prfkrn, prfkrna, cpkrn, cpkrna: tools for comparing kerning pairs in two (or three) relative TeX fonts, or in two releases of one font.

prfof, cprof: tools for comparing and proofing outline fonts.

Karel Píška

In his second presentation, **Karel Píška** applied his tools to analyze and verify the Latin Modern fonts. His results included examples of individual letter defects and inconsistencies. Interestingly, he found an inordinately large number of kerning pairs; the majority of which he thinks are not relevant to any language. Through his exacting work, Karel is improving the quality of the fonts we use every day.

Janusz M. Nowacki unveiled his complete set of Latin glyphs for the Cyklop font. Designed and cast in lead in Warsaw in the 1920s by J. Idźkowski, Cyklop is a very heavy sans-serif two-element font, Originally produced only in the oblique form, in sizes from 8 to 48 pt, Cyklop is used for newspaper titles, posters, forms, labels and invitations. In addition to the new Latin glyphs, Janusz has added a complete new upright variant.

To round out the day, an informal reception was held in the lecture hall, where participants could enjoy a glass of wine, pleasant conversation, and an exhibition of black and white prints taken by Janusz.

Wednesday

Paweł Jackowski presented this year's crop of TeX beauties and oddities, sixteen in total. You have to see these pearls to believe them. The entire collection can be found at:
 `http://www.gust.org.pl/pearls`.

Paweł Jackowski

Ross Moore spoke about his experience typesetting articles for *The Journal of The Australian Mathematical Society*. Leveraging the interactive capabilities of PDF, AMS journal articles, available free online, now incorporate useful meta data that readers would otherwise have to research themselves.

To enlighten our path to the future, **Arthur Reutenauer** recounted TeX's recent history. Subtitled "Pax TeXnica — The program on which the sun never sets", Arthur described how, from TeX78 to Aleph, XeTeX and LuaTeX, the various TeX engine extensions and macro packages have gradually enabled us to typeset every language and script of the world — well, almost.

Ulrik Vieth presented an overview of the TEX historic archive, an archive of historic TEX distributions and packages hosted on the TUG FTP server (`http://ftp.tug.org/historic/`). TEX's history spans thirty years now, and while its early history is well documented, the history of various macro packages, fonts, and systems like Metafont and MetaPost must often be pieced together from anecdotal evidence.

After thirty years, the history of TEX remains an interesting topic of research. The archive contains a wealth of information, but gaps still exist. Contributions are welcome, especially those about (pdf)TEX and Latin Modern fonts.

Bogusław Jackowski, Jerzy Ludwichowski and **Janusz M. Nowacki** described the current status of the two large font projects being developed by the TEX user groups: Latin Modern and TEX Gyre.

The Latin Modern fonts project was begun in 2002. Based on Computer Modern, the Latin Modern family currently consists of seventy-two text and twenty math fonts, available in both OpenType and PostScript Type 1 formats.

The Gyre font project that was begun in 2006 aims to supplement the thirty-three URW++ fonts distributed with Ghostscript to cover all Latin languages, similar to the LM fonts. Hinting is improved and files in OpenType format are provided. Extensions to the math capabilities are planned for the near future.

Here are the TEX Gyre fonts which have already been given new names:

Original name	:	Gyre name
Avant Garde	:	Adventor
Bookman	:	Bonum
Courier	:	Cursor
Helvetica	:	Heros
Palatino	:	Pagella
New Century Schoolbook	:	Schola
Times	:	Termes
Zapf Chancery	:	Chorus

The Latin Modern and Gyre project pages are on the `http://www.gust.org.pl` website, in the folders `/projects/e-foundry/latin-modern` and `/projects/e-foundry/tex-gyre`.

Recalling Niklaus Wirth's statement that "algorithms plus data structures equal programs", **Marek Ryćko** demonstrated how to realise Lisp-like structures and methods in TEX. Marek argued that a clean and consistent approach to handling lists of elements will make programming TEX simpler, and TEX programs, i.e. macros, more reliable.

Jerzy Ludwichowski concluded the conference proceedings by thanking the organizers, authors and participants. And as a particular encouragement, the GUST board awarded Sam the award for the best conference presentation. The award was impressed on one of the handmade paper sheets.

⋄ Michael Guravage
(with Hans Hagen & Taco Hoekwater)