Using TEX Gyre Pagella OpenType Math

Herbert Voß

Abstract

With XeLaTeX and/or LuaLaTeX one can use OpenType, TrueType, and/or Type 1 fonts in his documents. The isolated world of (La)TeX fonts is now history. However, the number of available mathematical fonts which corresponds to the possible text fonts is still very small. This brief note is an example of using the TeX Gyre Pagella OpenType font, including math.

1 Introduction

With the 2012 release of TeX Live another free OpenType math font has become available: Pagella (Palatino) Math from the TeX Gyre project (`http://www.gust.org.pl/projects/e-foundry/tex-gyre`), coordinated by GUST, the Polish TeX user group. This is an important step forward toward completing this longstanding work.

The following example shows an arbitrary composition of text and mathematical characters (from Stephen Hartke's document at `http://ctan.org/pkg/free-math-font-survey`). Both text and math are taken from the Pagella OpenType font.

Theorem 1 (Residue Theorem). Let f be analytic in the region G except for the isolated singularities $a_1, a_2, \ldots, a_m$. If γ is a closed rectifiable curve in G which does not pass through any of the points a_k and if $\gamma \approx 0$ in G then

$$\frac{1}{2\pi i}\int_\gamma f = \sum_{k=1}^{m} n(\gamma; a_k)\mathrm{Res}(f; a_k).$$

AΛΔVBCDΣEFΓGHIJKLMNOΘΩƱPΦΠΞQRST
UVWXYYΨZ 1234567890
aɑbβcɔdδeɛɛfζξgγhℏħiıjjkκlℓλmnηθϑoσςφφϕpρϱ
q r stτπuμννvwωϖxχyψz ∞ ∝ ∅∅dð

2 Loading the fonts

Using OpenType and TrueType fonts with XeTeX or LuaTeX requires a bit of setup, usually done automatically at installation. In general, one can have the font files saved in his local or main TeX tree, the local or main system font directory. For Windows there is only one main directory, e. g. `c:\\windows\fonts`. On GNU/Linux, one can also have font files saved in his home directory.

While XeTeX uses the system `fontconfig` programs to find a font file, LuaTeX uses its own font handling which creates a font list `otfl-names.lua`. The name is a little bit misleading because it also lists the TrueType fonts (with extension `.ttf`).

3 XeLaTeX

XeTeX uses the config file `fonts.conf` from the system `fontconfig`. This is in general not available on Windows; thus, TeX Live and MiKTeX provide a `fonts.conf` for use there. Listing all available fonts with corresponding directories can be done by running the program `fc-cache` in a terminal:

```
fc-cache -v > xetex-font-search.log
```

(The TeX Live manual has more details about font configuration.)

4 LuaLaTeX

As already mentioned, LuaTeX uses its own file to find where the font files are saved. If a font defined in a document isn't found in that list, LuaTeX creates a new list to be sure that newly saved font files are also found. If one uses several new font files it is simpler to run the program `mkluatexfontdb` by hand before running the TeX document.

5 Using the fonts

There is in general no difference between XeLaTeX and LuaLaTeX when it comes to defining the fonts in a document:

```
\usepackage{fontspec}
\usepackage{unicode-math}
[...]
\defaultfontfeatures{Ligatures=TeX}
\setmainfont[
   BoldFont=texgyrepagella-bold.otf,
   ItalicFont=texgyrepagella-italic.otf,
   BoldItalicFont=texgyrepagella-bolditalic.otf]
 {texgyrepagella-regular.otf}
\setmathfont{texgyrepagella-math.otf}
\setsansfont [...]
```

With such font definitions we get PDF output with embedded fonts as shown here (truncated):

```
$ pdffonts beispiel.pdf
name                                 type
------------------------------------ -----------
GOKAFU+TeXGyrePagella-Regular-Identity-H    CID Type 0C
OCZARV+TeXGyrePagella-Bold-Identity-H       CID Type 0C
PHLUTA+TeXGyrePagella-Italic-Identity-H     CID Type 0C
XEYJEO+TeXGyrePagella-BoldItalic-Identity-H CID Type 0C
...
```

◇ Herbert Voß
herbert (at) dante dot de

Editor's note: First published in *Die TEXnische Komödie* 3/2012, pp. 71–72; translation by the author.