

Open Development of Open Font

Introduction

/efont/ — Electronic Font Open Laboratory

Kazuhiko <kazuhiko@fdiary.net>

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- Toward the Next Generation

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Open Font Definition

- Just like 'Open Source Definition'
 - free redistribution
 - source code
 - derived works
 - no discrimination against persons/groups
 - no discrimination against fields of endeavor
 - distribution of license
 - license must not be specific to a product
 - license must not restrict other software

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Why is Open Font needed?

- To follow the changes (free to modify)
 - CCS/CES (Shift-JIS -> Unicode -> ?)
 - format (TTF -> OpenType)
 - design trends (line-oriented -> curve-oriented)
 - etc.
- To exchange documents (free to use, free to distribute)
 - W'Y'SIWYG --- What I See Is What You Get.

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Open Font Today

- Latin --- many (URW, Bitstream Vera etc.)
- Chinese --- some (Arphic 4 fonts, Wang 10 fonts)

汉字 漢字

- Korean --- some (Baekmuk 4 fonts)

漢字 漢字

- Japanese --- a little...

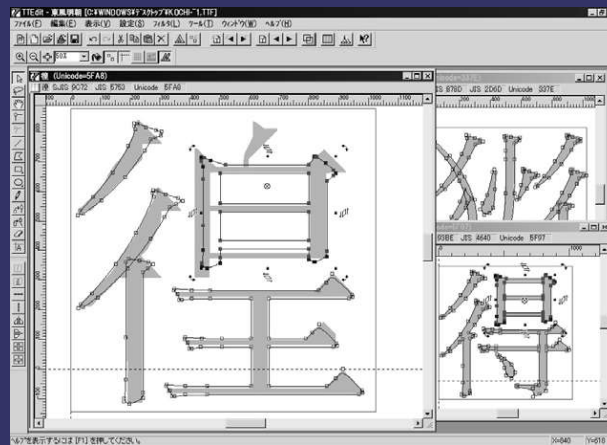
漢字 漢字

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Kochi Font

- License: public domain
- Method: parts assemble
- Based on a free TTF that is converted from a free 32dot bitmap font



Original bitmap



Converted TTF



Kochi font

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Kochi Font's Tragedy

- It was revealed that the origin of Kochi font is a stolen bitmap...
- The copyright holder of a original bitmap offered a 'free-of-charge' license
- The author of Kochi font rejected their offer, and the development was cancelled

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Next Generation Font Development

- Speed is first, but quality is second
- Framework that makes people to join development easily
- Good management to fragment problems and subjects

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Can we Collaborate
in Open Font Development?

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KANOUE Hiroki (ATLAS Co., Ltd.) <kanou@khdd.net>

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Themes

- express development of Kochi font substitute
- revaluation of Wadalab Font Kit
- development of human resources

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Present Status of Free/Open Font in Japan

- (presently) there is no font set for practical use
- development was done personally
 - “cathedral-building style” model
- collaboration was exceptional
 - jisksp16 (bitmap)
 - elisa font (bitmap)
 - derivative font development (bitmap and/or outline)

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Influences of “Kochi” font retraction

- undesirable effect is predicted
 - Illegal use of commercial fonts will increase
- need to basic fonts is very high
- we had to provide license-free substitute for Kochi fonts
 - The font in which their outlines are replaced with other original sources

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Development of Substitute Font

- distribution stopped at noon in 18th June
- the substitute is provided at evening in 21st June.
- blank is less than half a week
- other negotiations, publicities, answers to questions in parallel

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Timeline (1)

- Noon in June 18:
Furukawa announced to stop distribution of Kochi fonts
- Noon in June 20:
He told that alphabets and kana is his original.
- 16:00 in June 20:
Kazuhiko received reencoded Wadalab font from Akagaki
- 21:00 in June 20:
Uchida provided sasage-mono font (includes only Greek and Cyrillic glyphs)
- 1:00 in June 21:
sourceforge.jp/projects/efont/ opened.

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Timeline (2)

- 19:00 in June 21:
first (broken) version of substitute font was released.
- 20:45 in June 21:
Kazuhiko fixed the broken archive.
- 8:00 in June 23:
second version (fixed baseline mismatch) was released.
- Noon in June 23:
misencoding in 12dot bitmap is reported.
- Evening in June 26:
fixed version (by kludge script) was released.
- Noon in June 28: document is supplied together.
- August 9: minor fix is released.
(some bugs in pfaedit were fixed)

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Technical Elements

- Sources
 - kana and Latin script : from Kochi font
 - Kanji : from Wadalab font
 - Greek / Cyrillic (serif): from sasage-mono
 - Greek / Cyrillic (sans): CID conversion kit for Kochi font
- Tools
 - PfaEdit

the speaker is very familiar with them

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PfaEdit

- a font editor with many features
 - handles most of common font formats
 - abundant features
 - rapidly developed
 - powerful scripting
 - all processes is scripted for reproducibility and tracability
- see <http://pfaedit.sourceforge.net/>

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An example of pfaedit script: CID/OTF Conversion Kit

- Produces Adobe-Japan-1-4 glyph set
 - 15443 glyphs. About 3000 composit glyphs
- new kanji glyphs are edited by interactive session of pfaedit
- automatic composition of ligatures
 - 99 routines, 3800 lines
- other tools is also used: ttf2pt1 tftinker
- GSUB table generated by Adobe FDK for OpenType (AFDKO) — not included

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What is Wadalab Font?

- also mentioned as “Wadaken” (ken stands for labo) developed by Wada laboratory (University of Tokyo) members.
- output from their kanji glyph composition system
- released in 1993 (OCF format), later converted to CID Font
- 12,000 glyphs (including X 0208 and 0212 - supplementary kanji)
- design quality is barely acceptable
 - the purpose is system, not font

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Excerpt from Definition files

; joint definition

```
(setq 割 ' (yoko 害 りっとう))
```

```
(setq 害 ' (tate うかんむり 害の中 口))
```

; primitive definition

; points are defined in 400x400 square

```
(setq 害の中 ' (((200 12)
```

```
  (200 159 (link-ok t))
```

```
  (7 161)
```

```
  (392 161)
```

```
  (56 113)
```

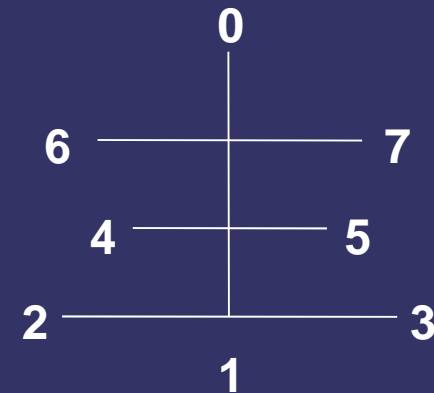
```
  (344 113)
```

```
  (41 65)
```

```
  (360 65))
```

```
((tate (0 1)) (yoko (2 3) (link 1)) (yoko (4 5)) (yoko (6 7))))
```

; 'tate' stands for vertical line, 'yoko' for horizontal line



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What is Wadalab Font Kit?

- released in June, 2003.
- written in UtiLisp/C and ulx (clx port to UtiLisp)
- renderer: 9,000 line, skeleton editor: 7500 lines
- Algorithms
 - sample skeleton is scaled uniformly
in some case, overlap is allowed
 - automatic balance of bounding boxes
based on balancing minimum distance of stems
 - stroke by program (serif, sans, rounded sans)

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Revaluation

- font quality
= algorithm + data definition(s)
- they were underestimated
if they had good aesthetical adviser, result
should be much better
- Good Lisp program
small meta notation on Lisp
allows trial and error of algorithms
but slow (two hours per typeface on
PentiumIII-866MHz)

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Brushing up

- porting UtiLisp/C and ulx (to FreeBSD)
- bug fix of stroke generator (parameter)
- fix of known misdesigns

.... one person x two months

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Reengineering plan

- port from UtiLisp/C to Common Lisp
 - decrease initial effort
 - run on many systems
- better skeleton editor
 - slow and lacks some feature (aligning, etc.)
 - should we add skeleton font support to PfaEdit?

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Reengineering plan (2)

- redesign of skeletons (we should not insist on autodesign)
 - extract strokes from existing public domain font data
 - targeting Ayu 20dot Gothic Font now
- redensing of stroke sample
 - from Kochi (stroke style is original)
dots, diagonal strokes...

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Reengineering plan (3)

- stroking algorithm
 - now based on geometrical calculation
 - BOTH aesthetical sense and programmer's carefulness needed
 - hard to collaborate
 - it should be replaced by template matching and coordinate transform
 - needs much sample data because they are less flexible
 - but easy to expect the result

I don't have enough spare time to refine balancing algorithm

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Difficulties of collaboration in font development

- standardization of design sense
- online discussion on the glyph design is difficult
- hard to share developer's time
- obscure specifications, unmaturing tools

but...

no one knows everything---typography,
font technologies, software engineering

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my experience (1) : jisksp16

- 1993-96
- 6 persons shared bitmap design
many of them are Morioka's Kanji ML
members
- extending 16 dot JIS X 9052 bitmap (X0208
implementation) to X0212
wrong policy about simplified glyph
Yasuoka checked and modified (about 1
year)
- some fluctuation in design remains

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my experience (2) : CID/OTF version of Kochi font

- 2001-2003
- glyph are taken from Kochi and QuiMi fonts
 - Uchida gave me facilities by designing needed facilities first
- planned the feedback of glyph designs actually very few characters

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my experience (3) : mona font

- 2002-now
- proportional font to width-compatible to "MS Gothic"
- development on anonymous BBS "2ch"
many user's feedback
- BDF -> bitmap TTF -> outline TTF
- original TTF table assembler/dumper (ttftinker)
- I cooperated as "18"
additional glyphs, fix of tools, outline

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my experience (4) : substitute for Kochi font

- success as an emergency measure, but continuous development is not shared.
- Uchida is planning JIS X 0213 definitions.

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my experience (5) : M+ outline fonts

- outline font development by coz (Morishita)
- preceding bitmap development and discussion on 2ch
- high quality modern sans-serif face
- begun in October 2003
- three major technical advisers
script coding, bitmap->outline
PfaEdit debug will progress

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How can We Get More Cooperators

- the problem common to other nitch OSS developments
- the largest problem in middle term
- everyone have interest in good design
- if you attract 100 users' eyes, 1 or 2 may join as developer...?

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Opening Good Font Developing Methods is Important

- tools and project management (how to share jobs)
- opening the knowledge makes developments in next generation easier
- this is worthful for commercial developers
 - a hopeful example: good hinting for non-latin scripts
 - FreeType and desktop manager developers made good autohinting
 - high-quality commercial product mainly targets to paper
 - good screen rendering (especially anti-alias) makes everyone happy

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Online Resources

- To know how qualities of hinting affect to anti-aliased glyphs, see:

http://cgi.din.or.jp/%7Emer/Fonts/Hint_Antialias/index.cgi

- Fonts and tools mentioned in this presentation:

gps.tanaka.ecc.u-tokyo.ac.jp/wadalabfont/pukiwiki.php

monafont.sourceforge.net

mplus-fonts.sourceforge.jp/mplus-outline-fonts/

sourceforge.jp/projects/efont/

pfaedit.sourceforge.net

www.asahi-net.or.jp/%7Esd5a-ucd/freefonts/

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