

OpenType GX

an exploratory proposal

<https://goo.gl/0N3zLy>

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TYPO Labs, 10–11 May, 2016, Berlin

Agenda

- Background
- Architecture
- Practicalities
- Proposal
- Implementation
- Possibilities
- Demos
- Discussion

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Background

- ATyp1 2014 Barcelona
- Noto Phase III
- FontTools + Sascha = gvar
- FreeType + Adam = IUP
- Skia graphics + Skia font
- ATyp1 2015: OpenType 2.0
- OpenType GX, the proposal

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Architecture

- MM vs TrueType GX
- Copy some tables over
- Possibly extend (later)
- Extend OpenType tables

Architecture

- Non-invasive
- Existing workflows...
 - Glyphs
 - UFO+.designspace
 - FontLab?

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Practicalities

- Overlap removal
- Cubic-to-quadratic
- CFF point numbers
- Extrapolation

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Proposal

- Font variation metadata
- Glyph shape variation
- Font metrics variation
- Positioning variation
- Conditional subst & pos
- Glyph metrics variation
- Hinting data variation

Font var metadata

- Apple 'fvar' table
 - Arbitrary axes
 - Named instances
- Apple 'avar' table
 - MutatorMath Bender
 - Luc(as) curve
 - Pablo curve
- Clarify standard axes

Glyph shape var

- Apple 'gvar' table
 - Arbitrary masters
 - per glyph
- Apply to 'glyf' / CFF

Font metrics var

- Apple 'fmtx' table
- 'fmtx' 2.0 for OS/2, etc
- No UPEM var allowed

Positioning var

- GPOS / GDEF
- Value / Anchor / Caret
- Device table
 - VariationDevice
- Merger script

Condi'nal subst & pos

- GSUB / GPOS
- Alternate lookups
 - MutatorMath subst
 - Glyphs 'bracket' trick

Glyph metrics var

- Needed for layout
- Performance
- New table for
 - 'hmtx' vars
 - 'vmtx' vars
 - 'VORG' vars

Hinting: TrueType

- Apple 'cvar' table
- Extend ttfautohint
- FreeType autohinter

Hinting: CFF

- Hint op vars
- Extend AFDKO autohinter
- Run-time AFDKO hinter

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Implementation

fvar / avar / gvar / cvar

→ Apple: OS X, iOS?

→ FreeType (bug fixes)

Implementation

fvar / avar / gvar / cvar

→ FontTools

→ varLib.__init__

→ varLib.mutator

Implementation

Combined with other tools

→ UFO + .designspace

→ Glyphs

Implementation

GSUB / GPOS / GDEF

→ Design

→ Prototype

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```
@font-face {  
    font-family: MyFont;  
    font-weight: 700;  
    font-stretch: condensed;  
    src: url("fonts/myvar.ttc#2,wght=1.4,width=0.7")  
        format(collection, variation),  
        url("fonts/fallback-bold-cond.ttf"),  
        format(truetype);  
}
```

```
@font-family {  
    font-family: MyFont;  
    src: url("myvar.ttf") format(truetype);  
    font-weight-min: 100;  
    font-weight-max: 500;  
    font-stretch-min: 70;  
    font-stretch-max: 130;  
}
```

Possibilities

- Justification
- Animation
- Grading
- Tickling
- ...

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Links

- <https://github.com/behdad/fonttools>
- <https://github.com/googlei18n/fontmake>
- <https://groups.google.com/forum/#!forum/fonttools>

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