August 7, 2010

Dear Members of the TUG Development Fund Committee:

This letter is to more formally restate my email request for additional funding from the TeX Users Group for the Oriental TeX Project of which I am the project leader and from which I collaborate with Hans Hagen and Taco Hoekwater and their highly relevant LuaTeX project, the latter which was also launched by the original Oriental TeX Project grant. In our recent email exchange you have asked for more status information, and I am happy to provide it here.

1. My role in the Oriental TeX Project project

I do the following with the Oriental TeX Project: project management; fund raising; provide long-term vision; provide OpenType expertise; mock font development in order to test features; software development planning and software quality assurance; documentation.

2. Accomplishments during the preceding funding cycle

I am grateful for the prior funding of $5,500 in partial support of my participation in the Oriental TeX Project. From the holistic perspective, during this period we finally crossed the Rubicon from elemental infrastructure to real-life results. In particular we have accomplished:

a Stabilization of the OpenType engine.

In this phase I provided, among other things, mock fonts for testing especially the GPOS instructions within OpenType fonts. Getting mixed GPOS lookups — such as cursive and kerning — to interact nicely has been a challenge.

b An effective workflow.

Hans Hagen and I operate iteratively. I extensively test the system by adding more and more lookups to our ever more sophisticated Arabic-script font, code-named Husayni. Then I torture the framework. Each time we find a bug I implement the lookup in OpenType Layout Services (OTLS) — often using a mock font that I especially develop for

that purpose — and visually compare it with the results of MkIV. Sometimes the bug is in MkIV, sometimes in the font, and sometimes in the FontForge code used by LuaTeX to open and read OpenType fonts.

Often Hans and I spend hours interpreting the results of both MkIV and OTLS. On rare occasions, we reject the VOLT interpretation of the spec. For instance, there was a rather esoteric case where it made much more sense to optimize the font rather than add an apparently illogical hack to the implementation of successive Pair Positioning lookup types.

More recently — early October last year year — I discovered a case where FontForge was confused about how to apply the so-called "Ignore Combining Marks" flag to certain lookups. In OTLS on the contrary the flag was applied by default.[1] In this case Hans and I had to bring Taco Hoekwater into the discussion and patch LuaTeX to get the correct interpretation of the tables.

The point is that, as a team, we draw on each other's talents to get the job done. I am pleased to be intimately involved in this process.

c Initial version of a paragraph-optimization scheme, using alternate glyphs. Thus, we are closing in on one of the "holy grails" of the Oriental TeX Project.

3. Request for additional funding

I am requesting an additional $3,000 of funding for partial support of my Oriental TeX Project work in this summer of 2010. This is important in order to keep the project moving.[2]

This summer we would like to focus on our fresh bi-directional model. Up to now, most bi-directionality in TeX has been naive, in the sense that it involves the mere mirroring of boxes via, e.g. the "pagedir and "bodydir primitives of Omega/Aleph. The actual needs of bi-directional scripts are much more subtle than that.

For example:

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[1]See http://fontforge.sourceforge.net/pfaeditchangelog.html

[2]I am starting a new round of funding applications this year, and I expect more success in my own fund raising efforts and to once again be able to feed that into TeX development efforts as before.

a The way numerals are handled in Arabic and Persian involve some subtleties.

b The way figures and floats are aligned should be done in text/par-directions-independent way.

c The Unicode bi-directional algorithm, while very important, is in some respects better suited to the needs of text-editing than to typography and typesetting.

d Naive mirroring on the old Omega model means that we have to do silly things like "leftaligned to get right alignment, etc.

More generally, a full solution to the challenges of bi-directionality needs to take into account (a) the Unicode Bi-directional Algorithm; (b) the needs of individual right-to-left languages with respect to bi-directionality; and (c) the relationship of bi-directionality to the structural elements of macro-typographical layout.

For my part, I intend to (a) provide a model and specification; (b) develop mock fonts for testing, as needed; (c) develop an extensive testing suite; and (d) write documentation.

4. Future commitments per your guidance

a I will provide a paper or extended abstract of my presentation at the TUG 2010 conference in San Francisco.

b I will provide a brief monthly update on what I have been doing and how the project is going during the life of this additional requested funding.

c I will write a paper on the project for a 2011 issue of TUGboat.

Thanks for giving me the opportunity to do this summing up. I look forward to further mutual cooperation in the short-, mid-, and long-term efforts to move the TeX paradigm to ever higher heights of excellence.

Best wishes, Idris

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