New Comprehensive Font Set to Serve Sciences

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All for one and one for all, six scientific publishers are working on a comprehensive font set that will include special characters used in scientific, technical, and medical publishing.

The publishers—American Chemical Society, American Institute of Physics, American Mathematical Society, American Physical Society, Elsevier Science, and the Institute of Electrical and Electronic Engineers—have been working together since 1997 to design, fund, and manage the font project.

Scientific and Technical Information Exchange (STIX) fonts, as the new font set is called, will be the first scientific fonts supported by Unicode. Each character is assigned a unique Unicode number, which can be used across all platforms, programs, and languages. STIX fonts will also include more than 7500 glyphs—far more than any existing typeface. "We may not have everything", said project director Tim Ingoldsby of the American Institute of Physics, "but it's pretty darn close."

The project group has designed the new typeface with a serif to resemble Times New Roman and expects it to be complete and ready for release by fall 2003. The STIX fonts will then be free for download, under royalty-free license, to editors, publishers, scientists, and the general public.

Currently, with no existing comprehensive font set, publishers assemble the characters they need by purchasing many fonts from different font manufacturers. Ingoldsby said it is unreasonable to expect individuals to do the same, inasmuch as publishers may spend tens of thousands of dollars to accumulate all the fonts they require.

Special characters also pose a problem for online publishing. "As long as all that is being required is PDFs, this is OK, because the publisher's fonts can be embedded in the PDFs, so every reader will have all the characters needed", Ingoldsby said. "In the Web world, this won't work. HTML (or, more likely, XML/MathML) documents will require the browser on the scientist's work station/PC to have access to every required character."

To avoid this problem, many online journals currently resort to pasting graphics of some characters into the text of the Web page. But inserting graphics is a poor solution, Ingoldsby said. "Often, the only way to create [special characters] is with a GIF", he said. "That looks awful if you try to enlarge the font, because the GIF will stay the same size." The result is images of characters that do not match the rest of the text in size and style and are not searchable as text.

In technical documents, the number of graphics required for special characters can be staggering. Consider, for example, a research paper on wave propagation that appeared in the *New Journal of Physics* in 2002.[1] The article was posted on the journal's Web site, *www.njp.org*, in both PDF and HTML forms. The HTML version, however, required a total of 270 graphic images to include all the symbols and equations needed. With STIX fonts, Ingoldsby said, this will be unnecessary.

As with any typeface, standard Web viewing will require all users to have the STIX fonts on their computers before they can properly read text posted with that font set. For that reason, the group of publishers is planning a big publicity campaign encouraging users to download the free fonts, Ingoldsby said. The STIX team also is encouraging software designers to incorporate the new fonts into their products.

To ensure that the new font set is comprehensive, each of the participating publishers provided a list of all the characters it uses to publish scientific documents. The lists were compiled and now have been incorporated into the STIX fonts.

Many characters and glyphs included in the STIX fonts are used only in subfields of mathematics and science. These include the symbols for many constants and operators, as well as more than 200 arrows. "You wouldn't think there were that many arrows", Ingoldsby said. "Single arrows, double arrows, triple arrows, curvy arrows . . . and each has a different meaning."

Project information and updates are available on the STIX fonts Web site, *www.stixfonts.org*. Once released, the new font set will be available on this site and the Web sites of all six participating publishers.

Reference

1. Shestopalov YV, Kotik NZ. Interaction and propagation of waves in slotted waveguides. New J Phys 2002;4:40.1-16. Available at www.iop.org. Accessed 5 August 2002.

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