Interactive MathML Processing on the Web

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Abstract

We have developed a new web site called mathmlcentral.com that is intended as a general resource for the MathML community. The site includes a set of interactive tools for creating, rendering, validating, and transforming MathML. Using these tools, it is possible to do the following.

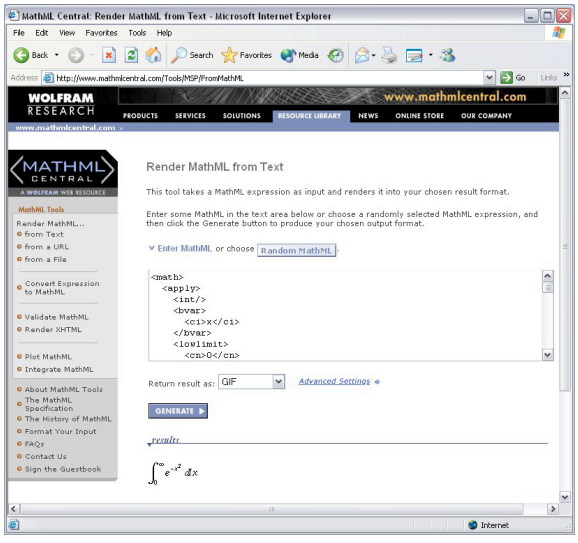
■ Convert MathML input to a variety of formats including GIF, JPEG, SVG, or *Mathematica* expressions. The properties of the output, such as the font size, transparency, display width, and so on are customizable via a preferences dialog.

■ Convert arbitrary mathematical expressions, in *Mathematica* syntax or standard mathematical notation, to MathML. The output can be in the form of presentation markup, content markup, or both and can also be tailored to a specific display environment, such as browsers supporting the W3C's Universal MathML stylesheet.

■ Validate MathML against the MathML 2.0 DTD. The server can check for syntax errors in any MathML expression and either confirm that the expression is valid or print an error message specifying the type and location of the error.

■ Perform simple computations on MathML input, such as plotting graphs or solving integrals.

■ Process XHTML documents to automatically convert any embedded MathML expressions into images. The resulting document can then be viewed in all browsers, including those that do not support MathML.



All the tools on mathmlcentral.com take advantage of *Mathematica*'s built-in functions for importing, exporting, and transforming MathML. A copy of web*Mathematica* running on the server is used to do all the computations and display the results in real time. The site integrates *Mathematica*'s computational abilities and its support for MathML with standard web technologies such as HTML, JavaScript, CSS, and Java. Our work shows how MathML provides a convenient format for creating dynamic math web sites and serving interactive computations on the web.