Interactive Teaching Materials in PDF using JavaScript

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Abstract

The use of JavaScript scripting language for adding interactivity to portable teaching materials of a high typographical quality in PDF file format is described. An extended version of the program TEX called pdfTEX is extremely useful for such purposes. It is shown that applications similar to those done by a CGI scripting on the web can be done in PDF, exploiting Acrobat forms and the embedded JavaScript engine implementation in Acrobat Reader or other PDF viewers.

An Outline

① Motivation: Teaching Materials needed

② Textbook Mathematical Analysis with Program MAPLE

③ Formats for Electronic Delivery

④ PDF

⑤ TEXnicalities

⑥ Summary and Future Work

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- A picture is worth 1000 words, an animation is worth even more (not only when showing series convergence).

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- Both textbook versions generated from *one* LaTeX source (with logical markup) with almost the same texts, but totally different design.

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- HTML, MATHML support in Internet browsers is not yet mature, low quality of typography and mathematics “typesetting”.

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- Images for animations are created by any means author wants: by METAPOST, Maple, . . . you name it. Images are *icons for form buttons* in PDF forms.
- TEX macros to automatize the generation process, including *document level JavaScript*.

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- The way of adding interactivity to mathematical textbook via JavaScript, TEX macros and Acrobat has been succesfully tested.
- The possible other usage of the method are possible: autotesting, multiple choice evaluation, multiple outputs (Braille, XML, . . .), calculator :-).