Making Materials Based on TeX and CAS/DGS

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Today, quite a number of mathematics teachers in universities and colleges are using TeX as their daily tool for editing high-quality mathematical documents, since it offers remarkable publishing features and extensive facilities for automating most aspects of typesetting. TeX also enables quick and easy edition, so that it is quite natural that those teachers use it also as their tool for editing teaching materials. However its capabilities for visualization and computation are fairly limited. So that, the simultaneous use of TeX and other devices (such as CAS or DGS) is often required. Such simultaneous use tends to result in the production of unsatisfactory teaching materials. For example, it is not so easy for usual teachers to manipulate the graphical outputs generated on the TeX documents in accordance with their needs to improve the educational effect of the materials.

  The basic goal of this working group is to open a forum for the exchange of ideas and disseminations of ongoing projects regarding the production of effective teaching materials with the simultaneous use of TeX and other devices. The emphasis is on computer tools that, either standalone or in combination with others (in the form of plug-ins, libraries, or similar), can substantially enhance TeX capabilities to generate high-quality mathematical documents for pedagogical purposes. The working group should include presentations addressing research and development issues or demonstrating technologies oriented to high-quality editing and printing of mathematics teaching materials. Examples might include TeX extensions and libraries, WYSIWYG mathematical editors and compilers, standards and developments for mathematical editing on the web, and so on. Among them, graphical extensions of CAS/DGS for mathematical printout (especially in the form of TeX) will become central topic. The presentations exploiting educational experience by using these technologies in an original way should also be included.

  The organizers hope that the discussion in this working group will shed some light on the following questions:

    Which methods are frequently used by teachers to insert mathematical artworks into printed teaching materials edited by using TeX?

     What are the merits or demerits of each method?

    In which conditions the graphical images generated on TeX documents can be

helpful for students to grasp mathematical concepts?

How does the simultaneous use of TeX and CAS/DGS graphical extensions enable teachers to improve their classroom design?

Are there any cases where the educational effect of the graphics use in TeX documents is demonstrated?

This working group solicits the presentations describing original research results in these fields. The working group language will be English.