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Introduction to KeTCindy --- Unification of Dynamic Geometry and High-Quality Printing ---

In the collegiate mathematics education, TeX has become a quite popular tool since it enables us to easily edit mathematical documents. However, it is not so easy for usual teachers to produce well-structured teaching materials with TeX. In fact, the generation of high-quality graphical images in TeX final output is not easy since the computational and graphical capabilities originally inherited to TeX is neither rich nor user-friendly. Also some extra elaboration is needed to place each components into the preferred positions of the document.

In order to lighten such burdens of teachers, we developed a plug-in named KeTCindy into the excellent dynamic geometry software Cinderella. KeTCindy converts the procedure to draw graphical objects on Cinderella screen into TeX readable code to generate the corresponding mathematical artwork on its final PDF output. The characteristics of KeTCindy system can be summarized as follows:

- (1) The generated image on TeX final output can be finely-tuned by using the KeTCindy commands embedded into the scripting language of Cinderella (Cindyscript).
- (2) Since high-quality graphics are generated on PDF format, they can be used on other software than TeX like Microsoft Word.
- (3) Through using Cindyscript, we can implement several package to flexibly format the TeX graphical output. So, for instance, we can easily generate animations on TeX.
- (4) The interactive operation onto the mathematical objects on Cinderella screen can be directly reflected onto its exported image.
- (5) Flexible page layout of TeX final output can also be executed through using the KeTCindy-related TeX environment named "ketlayer".
- (6) We can import the data calculated or simulated by using other computing software (like Maxima, Scilab, Risa/Asir and R) and combine them with the graphical data, so that extremely wide range of mathematical objects can be presented.
- (7) The procedure of TeX compilation has been extremely simplified through batch/shell processing triggered by button clicking on Cinderella.

As a result, KeTCindy system serves the environment in which learners can unify their intuitive reasoning through observation of the interactive presentation on PC and their discursive inference with the use of TeX document including finely tuned graphics.

In this workshop, we show the usage of KeTCindy system and demonstrate some samples generated with it, through which it is expected that some user-friendly environment for teachers to edit well-structured teaching materials can be established.