Visualize server side calculations with JSXGraph

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1   Abstract

There are a lot of great mathematical tools, like CoCoA, Maple, Axiom, Mupad, R, Mathematica, Matlab, and Maple, which can be used in a class room for presenting and discovering mathematical topics like geometry and algebra. To use these tools, the teacher first has to install them on all the student's computers and he usually has to teach the students how to use them. To avoid the sometimes complex and laborious installation and licensing issues and to save the extra lessons required to teach the students on how to use those mathematical tools, JSXGraph can be used as a graphical control tool, e.g. the user can choose the input parameters by dragging points. JSXGraph then sends the coordinates to a web server where a python script runs your program, grabs the results and displays them back in a web browser using JSXGraph.

Usually this is bound with a bunch of programming work, too. But to ease the integration of JSXGraph into your favorite mathematical tool (or the integration of your favorite mathematical tool into JSXGraph), we provide a Server-Client-Framework in JSXGraph, which does the biggest part of the work for you. All you have to provide - besides your program of course - is a small wrapper class written in Python and a JavaScript method to process the results from your program. This wrapper class is the link between JSXGraph and your program. In this class you provide methods, which eventually run your program and an initialization routine which tells JSXGraph which methods you want to be accessible from the web browser. JSXGraph uses this information to create a JavaScript function for each exported method, which you can call from within the browser and actually use AJAX to run your program on the server.