Web Based Laboratories for Teaching Electromagnetics for TEMPUS eLab Project

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Objectives

Development of:

- ***Web-Based Experiment ⇨ eLab****

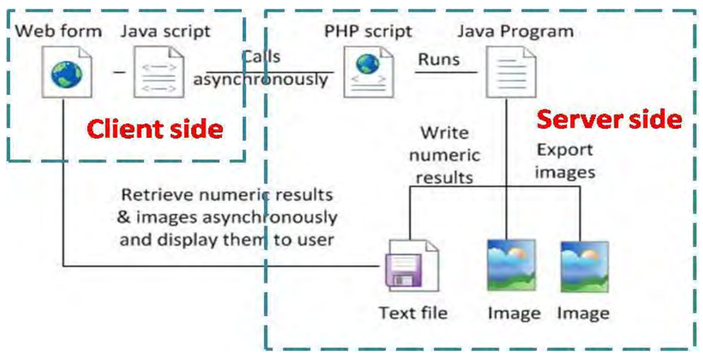
Challenging Issues

- Experiment should be remotely accessible through the internet using any browser
- No COMSOL installed on student's computer
- Should not require a student's experience in using COMSOL

Implementation

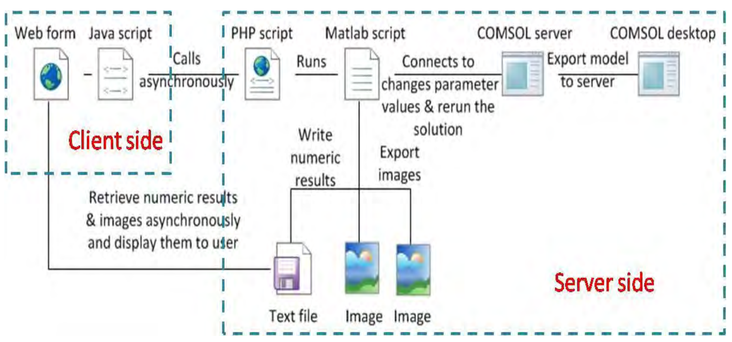
- Test experiment: "*Magnetic Field due to Parallel Current Carrying conductors*"
- Each task is packed into a Java applet
- Different interfaces corresponding to experiment's tasks and expected output

Evolution of the Development



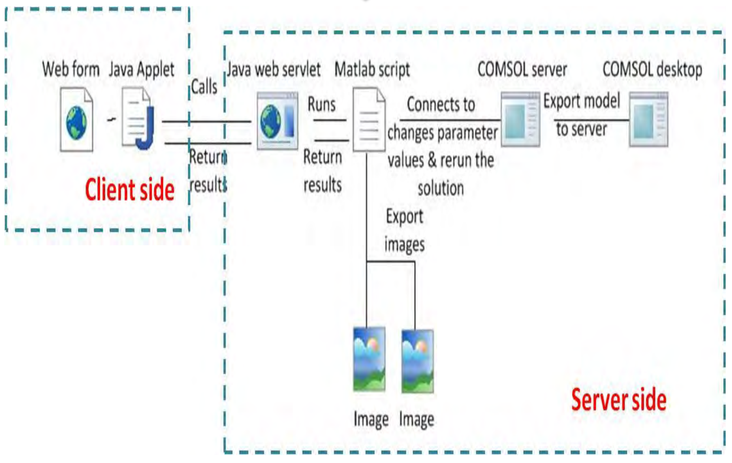
First Approach

- Needs to initialize the model each time a parameter is tuned
- Very long simulation time



Second Approach

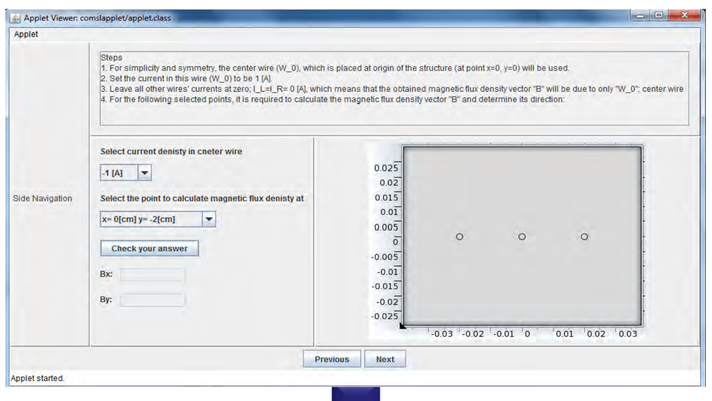
- COMSOL server holds the model in memory
- Better simulation time



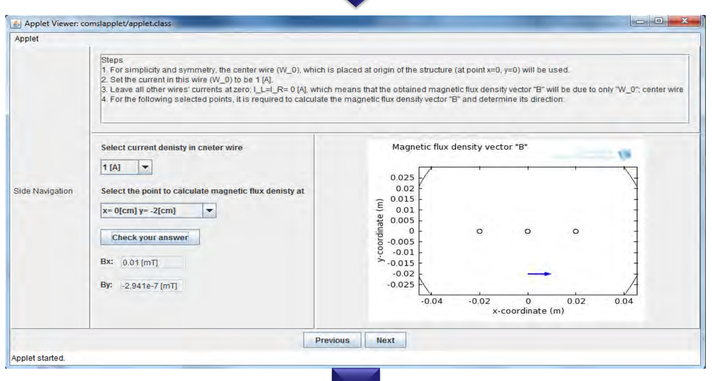
❖ Third Approach

- Better control of the flow
- More robust and less error prone

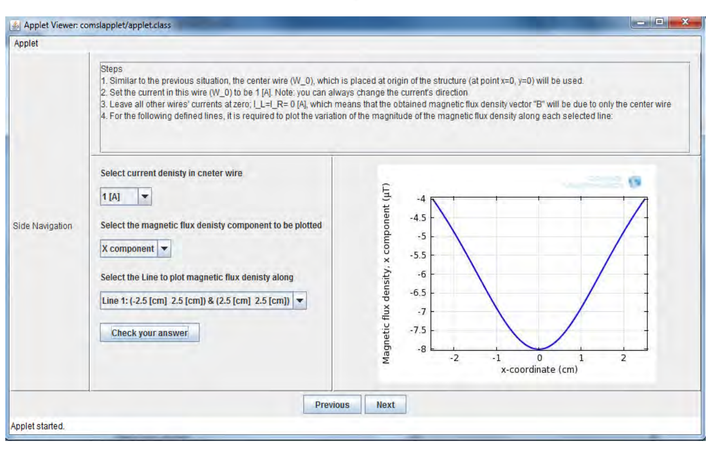
Snapshots of the Test Experiment



- Interface of the developed Java applet



- Displayed plot and numerical results for the magnetic flux density vector at a selected point



- Screenshot of the second task interface with the required plot displayed

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