

CER Technology Fellowship Program –2008

Project Team: Benjamin Schafer, Assistant Professor, Civil Engineering, Whiting School of Engineering; Kapil Dalwani, Graduate Student, Computer Science, Whiting School of Engineering

Project Title: Online Collaborative Sharing Tool for Structural Engineering Models

Audience: Students in undergraduate engineering courses covering: perspectives on structures, statics, theory of structures, steel design, concrete design.

Pedagogical Issue: Engineering students are limited in their abilities to collaborate and share solutions to structure analysis and design problems. Students often must create models from scratch which is time consuming and may limit their focus on higher level skills.

Solution: The objective of this project is to create a virtual home for sharing student created structural analysis models and their accompanying results. The benefit of such a virtual home is that in many cases students will not need to create models from scratch (a time consuming practice) and can immediately explore structural behavior and response for a variety of structures of their choosing. This creates the opportunity for more focus on higher-level comparison and contrast skills as opposed to the lower-level model building stage. In addition, creation of a virtual home will allow students at several institutions to contribute and share their models, thus allowing a much wider variety of models and model types to be explored by any one student.

Technologies Used: Linux, PHP, MySQL, Javascript, AJAX, HTML

Project Abstract: The objective of this project is to create a virtual home for sharing student created structural analysis models and their accompanying results. The enabling technology for the structural analysis models is the computational structural analysis program MASTAN2 (www.mastan2.com). MASTAN2 was specifically created for the educational environment and has recently been released as unrestricted freeware. With MASTAN2 as freeware, it has the potential to become a ubiquitous platform for structural engineering education. The developed web site will be partnered with MASTAN2 and shared across schools (Bucknell and Johns Hopkins will be the initial test schools). In civil engineering education at Hopkins these structural analysis models are useful in at least the following undergraduate courses: perspectives on structures, statics, theory of structures, steel design, concrete design, and senior design 1 and 2. What is envisioned for this project is a “YouTube” like web site that allows students to upload MASTAN2 models along with metadata describing who they are, what they have modeled, and other key results. Enhancements beyond the basic model sharing feature that will be explored including a user rating system and connecting the structures to their physical location using a mashup with Google Maps. Formal educational assessment of the created site will be completed through faculty and student input.