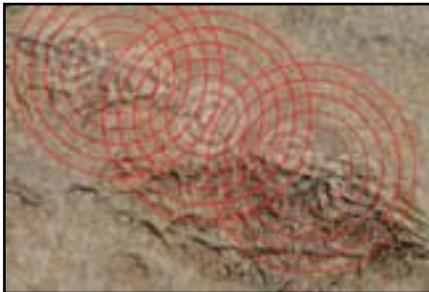


Using Advanced Interactivity to Create Compelling Simulations for Immersive Earth Science Visualizations

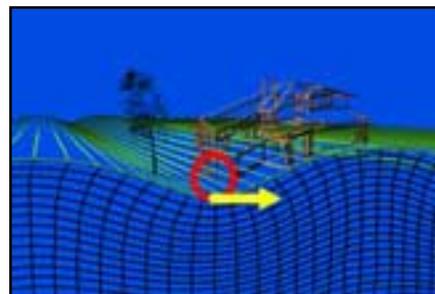
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I have worked closely with geoscience educators for the past five years helping them explore ways to apply technology to their educational efforts. My work has been in the role of education courseware development using tools that offer greater interactivity, accessibility, and scalability than those typically found in undergraduate education. In the past, high-end visualization tools such as AVS and OpenDX have been used to generate powerful visualizations for earth science education at San Diego State University, but have met with mixed results. It is extremely difficult to make these programs conveniently available to undergraduate students, and their non-intuitive interfaces only add to the challenge. Educators have a difficult enough time teaching complex concepts. The last thing they need is the challenge of teaching their students how to use a tool.



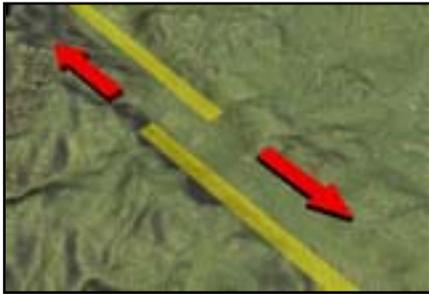
As a result, for the past few years I have developed a functional understanding of many tools useful for courseware development. My primary tool of choice is Macromedia Director®. It is the most powerful tool for prototyping and integrating instructional media available. For years, Director has been the leading tool for instructional courseware development. It offers advanced interactive features and cross-platform support. Now, with the addition of Shockwave 3D, a whole new realm of earth science modeling and simulation has opened up.

Still, Director cannot “do it all”. Perhaps my greatest strength is in identifying the appropriate tools for the job, and knowing how to integrate their results into a coherent and meaningful instructional experience. Other tools essential to Earth Science educational development include Discreet’s 3D Studio Max® or Corel’s Bryce® for more detailed



modeling, Macromedia's Flash®, Adobe's Photoshop®, and Apple's QuickTime®.

With these tools, I have recently developed an interactive stereoscopic flythrough capability for the GeoWall. The main feature that may be of greatest interest to the GeoWall community is that the stereo cameras can fly through a 3D space in much the same way our eyes do. In this regard, using simply a mouse as a navigation device, users can navigate a 3D space similarly to using a "magic wand" with a polhemus 3-space tracking device. GeoWall users who don't have such a device will find this very exciting.



With this new level of interactivity, we can introduce students to some compelling and profoundly realistic interactive experiences. Some relatively simple demonstrations of the capabilities have been developed and will be presented. These

demonstrations are only the beginning. Numerous other models developed and implemented with Shockwave 3D have been developed that run in a web browser using the Shockwave plugin, some with the ability to animate 3D objects by parsing XML data from a web site or by accessing a MySQL database. For those users without a GeoWall, additional demonstrations have been developed that can be "free-viewed" ("free-viewing" is a technique in which you cross your eyes to merge the two stereoscopic images and perceive depth). You can explore these and numerous other models that will soon be converted to stereoscopic versions for the GeoWall, at:



<http://www.edcenter.sdsu.edu/geowall/>

<http://www.edcenter.sdsu.edu/ssc/3d/>

<http://www.sci.sdsu.edu/volcano/>

<http://www.edcenter.sdsu.edu/3d/3dg/index.html>

<http://www.edcenter.sdsu.edu/dleseworkshop2004/3dearthquakes.htm>