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Graphics for Professionals

Eye-Popping Chemistry

Molecular structures come to life with Matrox DualHead2Go enabling real-time, full-color 3D stereoscopic images in the classroom.

Images courtesy of UCSF School of Pharmacy

Using a standard laptop computer, visualization software and his DualHead2Go, Professor Shafer can walk into the lecture hall minutes before class starts, hook up his DualHead2Go to two projectors with polarized lenses on them, and project impressive and effective stereoscopic images onto the installed non-depolarizing silver screen. Students just have to put on their passive, polarized glasses to view real-time full-color 3D images of the macromolecular structures being discussed in class.

The University

Renowned for its excellence in educating and training students in the health professions, the University of California, San Francisco (UCSF) boasts some of the nation's most prestigious advanced study programs in the health sciences. Working in the University's PharmD program and educating students in both pharmacy and graduate (PhD) programs is Richard H. Shafer, a professor of chemistry who also serves as Vice Chair of the Department of Pharmaceutical Chemistry.

The Challenge

Intrigued by stereo views of the skeletal system reconstructed from CAT scans a colleague created for medical students, Professor Shafer wanted to help his own students understand certain molecular interactions, for example, the tight binding of a drug to its receptor, by showing them molecular structures in stereoscopic 3D.

Stereo-viewing equipment was not a problem—UCSF had already invested in a non-depolarizing silver screen for one of its lecture halls, along with two projectors equipped with polarizing filters that allow left- and right-eye images to be displayed on screen. Students could use inexpensive glasses to see images in true stereoscopic view and full color. In addition, because of the ready availability of freeware programs for displaying stereo imagery in a side-by-side mode, Shafer was able to easily generate the displays on the fly.

His main challenge was finding a way to drive the two projectors from a laptop, because he really didn't want to haul a desktop computer to the lecture hall every class. He wanted to find a cost-effective alternative that would enable him to output two different images to two separate projectors from a single laptop.

The Solution

The first thing he looked at was the most common approach—using an expensive, dual-output graphics card capable of displaying quad-buffered stereoscopic images. However, this capability was only available on very expensive, specialized laptops.

Shafer's search for a convenient and relatively inexpensive solution came to an end when another faculty member recommended the Matrox DualHead2Go. He found the DualHead2Go was an inexpensive solution that worked with both Macs and PCs laptops. In fact, it was about 10 times less expensive than the other options on the market.

The Result

Shafer decided to try out his new setup on the first day of class in September 2008. He found the DualHead2Go remarkably easy to set up—it worked right out of the box and provided excellent stereo effect. Needless to say, the session went over very well—there were many oohs and aahs when the students put on their glasses and saw the stereoscopic effects. Seeing the binding interactions in 3D really helped the students comprehend intricate molecular interactions, and engaged them far more than a traditional lecture.

With the students so impressed and asking for more, Professor Shafer is now revising his lectures to incorporate more of these stereo viewing sessions to illustrate specific drug-receptor interactions using real-time display and manipulation of macromolecular structures such as proteins, DNA and drug-receptor complexes.

With this setup the University provides a powerful learning tool, giving students a unique perspective that helps them visualize and grasp complex subject matters.

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