

Saving Lives One Heart Beat at a Time

Designers of today's sophisticated medical devices need to use whatever tools they can to help ensure their project results in a successful product that meets all expectations. This article examines the pairing of a hardware solution with a software package that enables designers of products for smaller companies to achieve the results of those using more expensive systems.

By George Walsh

When performing coronary bypass surgery, surgeons must position the heart and stabilize the coronary artery, which is traditionally done by stopping the heart and using a heart-lung bypass machine to keep the patient alive. This procedure is not only extremely invasive; it is high risk and involves taking the patient to near death. The challenge for Strategix Vision, a Montana-based design firm, was to design a new device to stabilize the heart during surgery to allow for off-pump bypass surgery (also known as "beating heart" bypass surgery).



Utilizing NVIDIA Quadro FX graphics technology on workstations running SolidWorks CAD software, Strategix Vision designed the Embrace Heart Stabilizer, a device that stabilizes a portion of the heart during surgery without stopping the entire heart. With this product, which is widely used and marketed by Johnson & Johnson, heart surgery is less traumatic, has fewer complications, and often cuts recovery time in half. The Embrace Heart Stabilizer was recognized by BusinessWeek Magazine with a Gold "IDEA Award" for design excellence. The magazine commented: "Embrace is an example of innovation in function. Design put to good use to save lives."

"The advantage we have in the design market is that we deliver complete, well-thought-out solutions. We try to get inside the users head," says Marty Albini, Design Engineering Director for Strategix Vision. "That's why we have research professionals on staff and why we try to understand the whole environment the client is trying to address."

As one might expect, Strategix Vision's clients aren't interested in excuses about deadline delays. So, to deliver projects to customers on time and within budget, Strategix relies on professional hardware and software solutions that allow the design team to devote more brain cells to design and less to troubleshooting with the combination of SolidWorks design software and NVIDIA Quadro FX professional

graphics.

Hardware and Software Offer Solutions

Strategix relies on SolidWorks for a range of design challenges, including medical design. According to Albini, Solidworks has been the company's workhorse CAD software for many years, due to the program's ease of use and broad industry acceptance. Albini emphasizes that, while the company has tried many design software products, SolidWorks's features and functionality have increased over the years to compete with higher-end solutions, at a price point comparable to much less capable systems. "With SolidWorks, a small company like ours can have the design toolbox of a very large company," he says. "It's been a tremendous boon for us."

Albini is also impressed with SolidWorks's support structure, which relies heavily on its resellers for troubleshooting. "When you have a problem, you call them directly," he says. "If they can't handle your problem, they escalate it to the next level of support from SolidWorks, but nine times out of 10, the reseller can give you the answers you need. In the area of support, there are some real horror stories out there," Albini continues. "If you're working on a project, a problem can really stop you dead in your tracks. When our reseller hasn't been able to help us with a challenge we're facing, we've actually gotten calls from SolidWorks software developers reacting to enhancement requests that we've submitted. In the world of CAD development, that's pretty rare."

The combination of software and hardware also offers other benefits to Strategix. In particular, Albini cites the fact that NVIDIA Quadro FX GPUs can handle the display of SolidWorks' near raytrace capabilities. This is due to the fact that SolidWorks and NVIDIA have worked closely in optimizing the application on Quadro series GPUs to enable a feature called RealView, which allows SolidWorks users to create fully rendered images of solid models in real time. The rendered images, in combination with the reliability and speed of NVIDIA's graphics cards, help immensely in providing demonstrations of the company's designs to clients.

Award Winning Design

Strategix's choices in hardware and software are not the only factors in its success. Since the company opened its doors, it has won numerous awards for its achievements.

Among these honors are:

IDEA student Gold award (made it to the cover of *Time Magazine's* Design issue)

2000/2005/2006 IDEA Gold award (the "Oscars" of American design)

1999/2000/2001 Chicago Athenaeum Design awards

1998 Medical Design Excellence Award

"In the environment we're working in, we've tried graphics cards from just about every manufacturer you can think of," says Albini. "The key reasons that we've

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stayed with NVIDIA graphics are performance and unbeatable support. Some other graphics cards offer high performance in the short run, but as soon as a new operating system comes out, you can't use them anymore."

As for Strategix's investment in NVIDIA Quadro FX GPUs, the story doesn't end with what the graphics cards can do, but in the fact that the company really doesn't have to think about them once they're installed. "NVIDIA keeps us focused [on] our work rather than on solving problems with hardware," he says.

The Human Element

Strategix's design mantra is straightforward to make technology human. "In the world of design, creativity is what it's all about," explain Albini. "Technology is not an end in itself, but a means to an end." The combination of Solidworks and NVIDIA Quadro FX graphics gives Strategix designers the professional tools necessary to concentrate on the design and delivery of product. "It's a win-win situation that keeps a flourishing firm up and running," says Albini. "It also has the potential to save human lives."

ONLINE

For additional information on the technologies and products discussed in this article, visit the following websites:

www.strategixvision.com [1]

www.nvidia.com [2]

www.solidworks.com [3]

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