Graphics chips speed up medical imaging

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Beyond just jazzing up video games, one of the growing array of applications being found for the powerful graphics-oriented chips that Nvidia and Advanced Micro Devices sell is in speeding up medical imaging, which can be a lifesaving benefit.

Using the kind of microprocessor that runs most personal computers and many medical gadgets, it would take an hour to produce a three-dimensional picture of a breast scanned by an ultrasound imaging device being developed by TechniScan, according to Jim Hardwick, a software engineer with the Salt Lake City company.

But with an advanced graphics chip made by Santa Clara-based Nvidia, he said, it takes about half that time.

Hardwick, who participated in a demonstration of several technologies enhanced by graphics chips at Nvidia's headquarters last week,? said it's important for doctors and their patients to get the results of such scans as quickly as possible.

"They want to be able to look at the image and talk before she leaves the office," he said.

Traditionally, most brainy computing tasks were done by microprocessors, also known as central processing units, or CPUs, which are mostly sold by Intel of Santa Clara. Graphics chips were seen as accessories, providing pretty pictures.

But in the past decade, a new kind of graphics chip -- known as a graphics processing unit or GPU -- has been developed to challenge the CPUs as well as Intel's dominance in the high-performance chip market.

Sold predominately by Nvidia and Advanced Micro Devices of Sunnyvale, GPUs have far more individual computing engines, or cores, than CPUs. That allows the GPUs to process multiple streams of data simultaneously, which makes them quicker at handling certain tasks than CPUs.

Indeed, a study last year by University of Pittsburgh researchers found that an Nvidia GPU produced much speedier computerized-tomography images of lung cancer than was possible with a CPU. As a result, the researchers concluded, "the benefit of using GPUs' processing power can be widely appreciated in medical image devices and diagnosis."

Sanford Russell, general manager of an Nvidia business unit exploring new uses for GPUs, said the chips are in several medical-imaging devices already being sold. He declined to identify the manufacturers, adding that Nvidia doesn't reveal its revenue from such sales. But he said his company is pleased with its progress in the medical area.

Over the past couple of years, the speed of Nvidia's GPUs has made them increasingly useful for everything from weather forecasting and commercial food development to analyzing chemical hazards and potential oil deposits. That swiftness also is attractive to health professionals, who have come to rely on medical-imaging machines to provide increasingly detailed pictures of diseases and other ailments.

Machines that provide 3-D views are especially useful because they sometimes enable doctors to spot maladies not visible on other equipment, experts say. But enormous data needs to be processed to produce 3-D images. That's why AMD's GPUs are used in a 3-D-capable

machine that Brussels-based Barco sells for radiologists, according to Lynda Domogalla, Barco's product marketing director.

While intensive image processing "is too much for the CPU to handle," she said, with a GPU manipulating the picture, "it's on a screen very quickly so the radiologist doesn't spend time waiting for the display."

AMD took a big financial risk in 2006 when it jumped into the GPU business with its $5.6 billion purchase of graphics chip-maker ATI Technologies. But AMD's GPUs are certainly proving their worth in markets such as medical imaging, said Patti Harrell, the company's director of stream computing. Even Intel is developing its own GPU.

"Ten years out," Harrell said. "I think you're going to find them in virtually all of the medium- and large-scale scanning and screening types of devices."

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