GPU Computing

Acceleware & The University of Wisconsin-Madison

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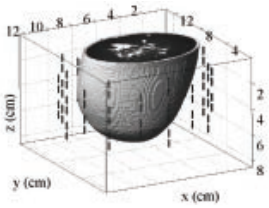
CHALLENGE

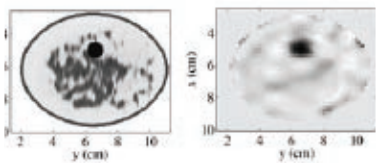
The earlier that breast cancer can be detected, the greater the survival rate. Dr. Susan Hagness and a multi-disciplinary team of scientists are investigating the use of ultra-short pulses of low-power electromagnetic waves to produce 3-dimensional diagnostic images of the breast and higher-power waves to focus energy at the site of a tumor to treat the cancer. The technology has a potential to detect cancer through harmless scans of the breast providing diagnostic information that is complementary to X-ray mammography, and to treat the cancer without surgery. However, constructing the images from the data produced by the technique requires repetitive, time-consuming calculations.

SOLUTION



Researchers at the University of Wisconsin-Madison have adopted the Acceleware hardware acceleration platform, which harnesses the power of NVIDIA GPU computing solutions to dramatically increase the speed of the sophisticated computations required by the technology. “Our new breast-imaging technology, which is being developed for breast cancer detection, incorporates algorithms such as inverse scattering solutions, which are tremendously computer-intensive. Acceleware’s solution provided us with an order of magnitude speed-up of those computations, allowing for image generation in hours instead of days,” says Dr. Hagness. This technology provides a 3-dimensional image of the breast which provides detail that makes it easier to interpret and localize a potential problem than the traditional 2-dimensional mammography images.

IMPACT



For many types of cancer, including breast cancer, it is more advantageous to treat and cure the cancer if it is found early.[1] By using the Acceleware/NVIDIA solution, the creation of microwave images after a full breast scan can now take as little as a few hours to complete, quickly providing the treating physician with a better-quality, 3-dimensional image on which to base diagnosis and treatment decisions—without requiring an uncomfortable or invasive procedure. Dr. Hagness and her team at the University of Wisconsin-Madison hope that this technology will someday be used to treat patients more easily, with less discomfort. The results are promising and combined with a reasonable price point, this technology has potential for expansive use in the future.

For more information, visit: www.acceleware.com
For more information about NVIDIA GPU computing solutions, visit www.nvidia.com/tesla
[1] http://www.cancer.org