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2009

Fovia, Inc.: Recipient of the 2009 North American Interactive Advanced Visualization Platforms Technology Innovation of the Year Award

"We accelerate growth."

2009 North American Interactive Advanced Visualization Platforms Technology Innovation of the Year Award

Award Recipient: Fovia, Inc.

Award Description

Frost & Sullivan's Technology Innovation Award is bestowed upon a company (or individual) that has carried out new research, which has resulted in innovation(s) that have or are expected to bring significant contributions to the industry in terms of adoption, change, and competitive posture. This award recognizes the quality and depth of a company's research and development program as well as the vision and risk-taking that enabled it to undertake such an endeavor.

Research Methodology

To choose the award recipient, Frost & Sullivan's analyst team tracks innovation in key hi-tech markets. The selection process includes primary participant interviews and extensive primary and secondary research via the bottom-up approach. The analyst team shortlists candidates based on a set of qualitative and quantitative measurements. The analysts also consider the pace of research and technology innovation, and the significance or potential relevance of the innovation to the overall industry. The ultimate award recipient is chosen after a thorough evaluation of this research.

Measurement Criteria

In addition to the methodology described above, there are specific criteria used to determine the final rankings. The recipient of this award has excelled based on one or more of the following criteria:

- Significance of the innovation(s) in the industry, and across industries (if applicable).
- Potential of the products of innovation(s) to become industry standard(s).
- Competitive advantage of innovation vis-à-vis other related innovations.
- Impact (or potential impact) of innovation(s) on company or industry mind share and/or company bottom line.
- Breadth of intellectual property related to the innovation(s), that is, patents, scientific publications, and papers in peer-reviewed journals.research and development (R&D) spending, products in development, and new product features and modifications. This is accomplished through interviews with the market participants and extensive secondary and technology research. All new product launches and new products in development in each company are compared and evaluated based on degree of innovation and customer satisfaction. Companies are then ranked by number of new product launches and new products in development.

The Frost & Sullivan 2009 North American Technology Innovation of the Year Award in the field of interactive advanced visualization platforms is presented to Fovia, Inc., a privately held company located in Palo Alto, California. Fovia is being recognized for its CPU-based, High Definition Volume Rendering® platform that offers unrivaled image quality and uncompromised performance for 2D/3D advanced volume visualization. Volume rendering is an advanced technique for analyzing extremely large sets of data in three-dimensions. This technique has extensive applications in fields such as medicine, dentistry, veterinary science, industrial engineering, geoscience and bioscience. Fovia's innovative, software-only High Definition Volume Rendering solution overcomes the many limitations of imaging technologies currently available, and enables local, enterprise-wide and web-based volumetric rendering. Furthermore, Fovia's High Definition Volume Rendering solution, or HDVR®, successfully leverages the scalability and flexibility of off-the-shelf CPUs.

Company Background

Fovia, Inc. was founded in 2003 to address the challenges of data explosion – the exponentially increasing amount of data being acquired by modern imaging modalities. Scalability of its rendering solution was of paramount importance, and the company felt that by developing a CPU-based solution, it could leverage multi-core, multi-processor and multi-threaded generational processor development. Over time, this strategic vision has been validated. HDVR is more scalable, cost effective, flexible, and easily deployable on an enterprise-wide basis than GPU or other hardware-based approaches. Fovia's HDVR software engine can be easily and natively integrated into various original equipment manufacturers' offerings, therefore allowing OEMs to quickly and cost-effectively offer best-in-class volume rendering to their customers.

Fovia's customers include GE Healthcare in the medical imaging field, AMICAS in the PACS field (picture archiving and communication systems), 3M/Imtec in the dental and industrial cone-beam CT field, iDent in the dental implant field, and Animage in the veterinary field. The company has also signed approximately 200 research agreements with leading universities and research institutions around the world.

Fovia has attracted an internationally recognized group of educators and researchers to serve on its advisory board, including Geoffrey D. Rubin, M.D., Stanford; Sandy Napel, Ph.D., Stanford; Gordon Harris, Ph.D., Harvard; Eliot Siegel, M.D., University of Maryland; Richard S. Breiman, M.D., University of California, San Francisco; and Thomas Schiff, Professor Emeritus, D.M.D., University of the Pacific.

Technology Relevance in the Market Place

The amount of thin-slice, volumetric data acquired by modern imaging modalities continues to increase at an exponential rate. Thousands of CT slices can now be captured in less time than it took to capture 50 slices just five years ago. This increased data production has made patient evaluation based entirely on source images (axial slices) virtually impossible. Viewing hundreds or thousands of printed images in 2D on x-ray film, using a traditional backlit light box, is impractical, time-consuming and expensive.

Advanced 3D visualization has become a critical component of medical care, and 3D analysis is essential in areas such as clinical diagnosis and surgical planning. 3D views improve surgical outcomes by giving surgeons a better "road map" from which to plan their procedures. Interactive navigation of volume data from scanners also spares some patients from invasive procedures such as endoscopy or conventional angiography. Similarly, in the dental field, 3D tools have become critical in a number of specialties, including implantology, orthodontia and TMJ treatment.

Three dimensional imaging is a valuable tool for accelerating diagnoses, eliminating unnecessary tests and treatments, optimizing the use of minimally invasive surgeries and therapies and gaining additional insight needed for clinical decisions. Driven in part by a shortage of radiologists, the high cost of imaging equipment and overall cost pressures in the healthcare system, an increased workload must be completed with the same or fewer people as before. Speed in interpreting images is essential for increasing workflow productivity and avoiding bottlenecks caused by the large number of images being generated. Therefore, from both a cost and a quality of service perspective, there is a clear need for efficient, high quality advanced visualization tools.

However, despite the well-established need for advanced visualization tools, and the dramatic improvements in the technology used to acquire volumetric data, the technological advancements required for efficient visualization and distribution of such data has been slow to materialize. This disparity has resulted in bottlenecks, inefficient workflow, poor visualization quality and performance, as well as missed or delayed diagnoses and increased liability.

Prior to the introduction of Fovia's CPU-based HDVR software, existing solutions were unable to handle the large volumes of data being generated, and they exhibited many limitations, including: requiring expensive graphics cards or specialized hardware (ASICs); forcing significant trade-offs between image quality, speed and cost; inability to easily distribute images remotely (therefore requiring a dedicated, advanced visualization workstation); inflexibility and non-scalability; and a high obsolescence factor.

Fovia's HDVR technology, on the other hand, has successfully overcome these volumetric data challenges. With Fovia's software, large volumes of data can be visualized and analyzed in high definition -- both locally on workstations and remotely via server-based, thin-client technology.

Just as business applications have evolved from mainframe-based solutions to desktop applications to applications being delivered via a client-server model (including via the internet and smart-phone delivery), volumetric imaging is following a similar evolutionary path. Fovia's proprietary algorithms, running on off-the-shelf hardware, allow 24-hour remote, interactive visualization, thereby enabling a paradigm shift in volumetric imaging.

How the Technology Works

Fovia's enabling technology is based on a proprietary new family of algorithms with far lower computational costs, more efficient memory utilization and significantly better image quality than any currently available solution – including those utilizing dedicated hardware. The performance improvements stem from high-level algorithmic optimizations that exploit coherence in the data more efficiently than previous approaches. These new algorithms achieve rendering rates that are fast enough for interactive applications on desktop computers or laptops, without using specialized hardware and without compromising image quality. They are the foundation for the world's most advanced, fully interactive volume visualization system, capable of achieving interactive, High Definition Volume Rendering on desktop PCs or laptop computers, both locally and in client-server environments.

The software's superior performance and quality are the result of proprietary, volumetric ray-tracing algorithms that deliver on-the-fly interactive, deep super-sampling quality with off-the-shelf Intel processors. Fovia's volumetric ray-tracing algorithms, coupled with Intel's multi-processor, multi-core and multi-threaded architecture, represent a scalable category killer in the volume rendering field.

Fovia has designed its software engine to be easily integrated into various OEM offerings, thereby allowing OEMs to easily, quickly and inexpensively integrate a best-in-class 3D solution. Fovia offers flexible integration options to OEMs through deep, native integration of its HDVR software engine via an SDK-API with Java, C++ or .NET/C#.

Innovative Features

Fovia's High Definition Volume Rendering platform is a disruptive technological breakthrough that overcomes the many limitations of currently available imaging technologies, and enables local, enterprise-wide and web-based volumetric rendering.

HDVR is more scalable, cost effective, flexible, and easily deployable on an enterprise-wide basis than are GPU or other hardware-based approaches. Fovia's HDVR software engine can be easily and natively integrated into various original equipment manufacturers' offerings, therefore allowing OEMs to quickly and cost-effectively offer the world's most advanced volume rendering to their customers.

Fovia's HDVR algorithms and architecture take full advantage of the future directions in both imaging and computing (larger datasets, larger projection displays, multi-core processors, multi-threading, multi-CPU environments and server-side rendering for thin-clients) without sacrificing quality or performance. This scalability has been, and will continue to be, critical to ensuring the long-term superiority of Fovia's solution.

The software's ability to deliver non-compromised remote rendering (including via the internet or over wireless connections) is one of the key advantages of Fovia's HDVR solution. With Fovia's HDVR architecture, any networked PC or laptop can serve as an advanced 3D post processing workstation, enabling "anytime, anywhere" access to imaging workflow.

Fovia's HDVR software eliminates dependence on proprietary hardware. The HDVR platform is hardware agnostic, cross-platform and runs on Windows, Linux and Mac platforms. Any permutation of servers and clients is possible, therefore allowing a hospital, for example, to run its servers on any of Fovia's three operating systems, while having thin-clients simultaneously and concurrently using Windows, Linux and Mac operating systems.

Fovia's technology platform enables radiologists and other users of imaging data to make better decisions through more effective utilization of the imaging data acquired by modern scanners. Fovia's HDVR solution directly addresses the significant limitations of currently available imaging technologies, including the difficulties in effectively visualizing and analyzing the increasing quantity of volumetric data acquired, and the distribution of such data directly to users who may be in different locations.

The scalability of Fovia's technology, its freedom from GPUs and specialized hardware, and its server-side rendering address and overcome significant problems and challenges in the volume rendering field, and contribute to the disruptiveness of Fovia's technology.

Conclusion

Frost & Sullivan is pleased to present Fovia, Inc. with the 2009 North American Technology Innovation of the Year Award in the field of interactive advanced visualization tools, in recognition of the development of its High Definition Volume Rendering technology. Through strong capabilities and credentials, Fovia, Inc. is positioned to offer OEMs advanced visualization that can be deeply integrated to meet everyday market needs today and tomorrow. Over time, advanced visualization tools such as HDVR will become more commonplace as they are integrated within OEM systems, offering their customers advanced 3D functionality as a standard part of their system solution.

About Frost & Sullivan

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