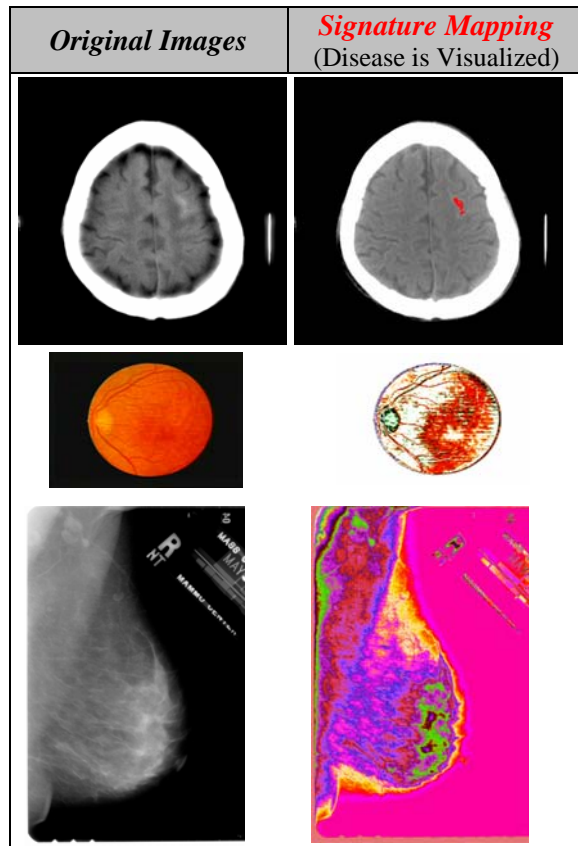


A New Vision for Medicine - a New Tool for the Detection of Diseases



Guardian Technologies (GDTI) provides high-performance image analysis solutions that achieve detection levels that many scientists, industry leaders in threat detection, and medical imaging professionals believed could not be achieved. Initially deployed for advanced explosive detection, GDTI's PinPoint™ product has proven enormously successful in detecting organic explosives with very low false alarm rates. This same core technology is now being marketed through GDTI's newly-formed, wholly owned subsidiary, Applied Visual Sciences, Inc. for medical applications under the brand name "Signature Mapping". Evaluation of *Signature Mapping* capabilities have demonstrated significant positive clinical results across a wide range of medical applications including; radiology, pathology, neurology, ophthalmology, new drug testing, and dental imaging. While all of these areas of medicine represent significant opportunities for GDTI, the company's initial market focus is in the field of diagnostic radiology. *Signature Mapping* incorporates GDTI's patent

pending core technology to process, map, visualize, detect, and identify unique image-based "signatures" or "fingerprints" for a wide range of tissue types and disease states that have been previously unidentifiable or indistinguishable to the human eye. GDTI's suite of advanced radiographic analytical products represents the potential for significant breakthroughs in clinical diagnostic capabilities. The company plans to develop a family of products for the visualization, detection and characterization of diseases utilizing *Signature Mapping*™ technology applied to radiographic analysis and clinical interpretation.

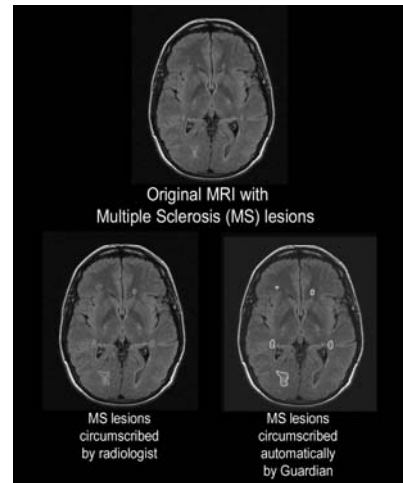
Signature Mapping offers extensive clinical usefulness and value for diagnostic radiology. Guardian's software solutions are easily integrated with all imaging modalities including CT, MRI, Ultrasound, Nuclear Medicine and PET, Digital Vascular Radiology and Digital X-Ray. Within radiology, the company currently is focusing its resources for ongoing product development and clinical investigations in brain, breast, and lung imaging.

BRAIN IMAGING

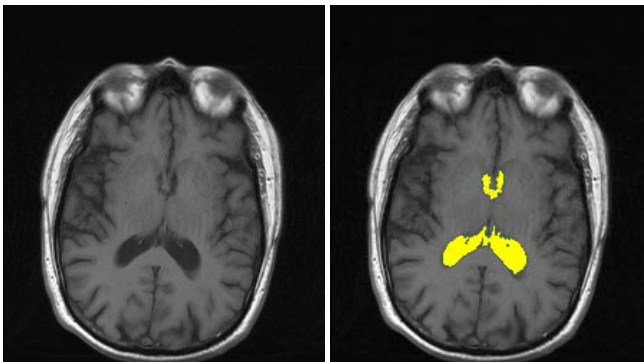
Guardian has deployed Signature Mapping in three related brain imaging applications:

- Multiple sclerosis, (MS) is a disease that has been diagnosed in over 400,000 Americans, and may affect up to 2.5 million people globally¹. MS is a lifelong disease with no cure. Patients have multiple MRI scans during the diagnostic process, as well as follow-up assessments requiring the radiologist to quantify and report any changes to MS lesion(s) over multiple studies and time. This evaluation process is a time-consuming and inexact activity when done without the help of an automated detection technology.

Signature Mapping algorithms are capable of accurately detecting lesions and more importantly, providing accurate measurements of size and overall lesion volumes. Compared to clinical observers, *Signature Mapping* proved to be a more sensitive tool for detecting lesions which were considered marginal or undetectable and provided extremely accurate measurements while reducing the radiologist analysis time from minutes to seconds.



- Normal pressure hydrocephalus is another neurological area under investigation with *Signature Mapping*. In the normal course of aging the adult brain begins to shrink, and as a result, the internal ventricles which contained cerebral spinal fluid enlarge. Enlargement of the ventricles is also associated with numerous anomalies including obstructing tumors. The challenge for the radiologists is to determine whether the pressure changes in the ventricles are caused by the normal aging process or due to an anomaly. *Signature Mapping* imaging software can detect and quantify ventricular size and visualize the cerebral spinal fluid from MRI images. As a result of this capability, *Signature Mapping* has demonstrated its ability to detect cerebral spinal fluid and provide a methodology for segmenting the ventricles and quantifying ventricular size and changes over time.



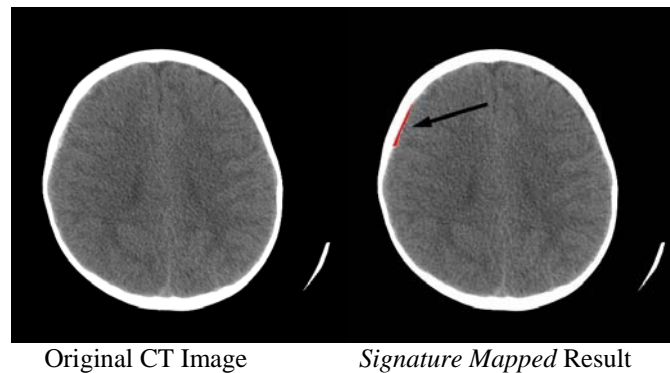
Signature Mapping imaging software can detect and quantify ventricular size and visualize the cerebral spinal fluid from MRI images. As a result of this capability, *Signature Mapping* has demonstrated its ability to detect cerebral spinal fluid and provide a methodology for segmenting the ventricles and quantifying ventricular size and changes over time.

- Acute intracranial hemorrhage (AIH) is the third area of neurological application for *Signature Mapping*. This area is of clinical interest due to the large number of intracranial bleeds occurring due to traumatic head injury. There are over 1.4 million traumatic brain injuries in the US non-

¹ http://www.nationalmssociety.org/site/PageServer?pagename=HOM_ABOUT_who_gets_ms; National Multiple Sclerosis Society web site

military population each year². *Signature Mapping* is an accurate and sensitive tool for the detection of acute intracranial bleeds. It also demonstrated an ability to differentiate between small intracranial bleeds such as less than 5% subdural hematomas from difficult to discern bone-hardening artifacts typical in most CT scans.

Signature Mapping for AIH – The red area in the image on the right below shows the area where *Signature Mapping* correctly located the hemorrhage.



LUNG IMAGING

Signature Mapping as an initial screen tool and monitoring device for Tuberculosis (TB).

Tuberculosis is a serious world health problem; the World Health Organization estimates that over 2 billion people or one third of the world population currently are infected with the TB bacillus (germ) and that 5 – 10% of these people will become sick or infectious at some point in their lives³. Tuberculosis is an immune deficiency disease and is a leading cause of death for people who are HIV positive. Tuberculosis is a leading cause of death outside the United States afflicting millions of people in Africa and Eastern Asia⁴. A *Signature Mapping* methodology has been developed to detect lung volume area, quantifying normal lung volume from diseased lung volume and quantitatively report changes through the drug treatment progress. *Signature Mapping* has demonstrated itself to be an excellent tool to aid in quantification and tracking of TB therapy.

² Traumatic Brain Injury: Definition, Epidemiology, Pathophysiology, January 26, 2007, Author: [Segun T Dawodu, MD, FAAPMR, FAANEM, CIME, DipMI\(RCSed\)](#), Former Clinical Instructor, Mount Sinai Medical School; Current Director, Pain and Injuries Rehabilitation Services, [PMRehab Pain & Sports Medicine Associates](#); web site: Brain injury association of American, statistics: <http://www.biausa.org/aboutbi.htm>; web site: Center for Disease control, National Center For Injury Prevention and Control, fact sheets

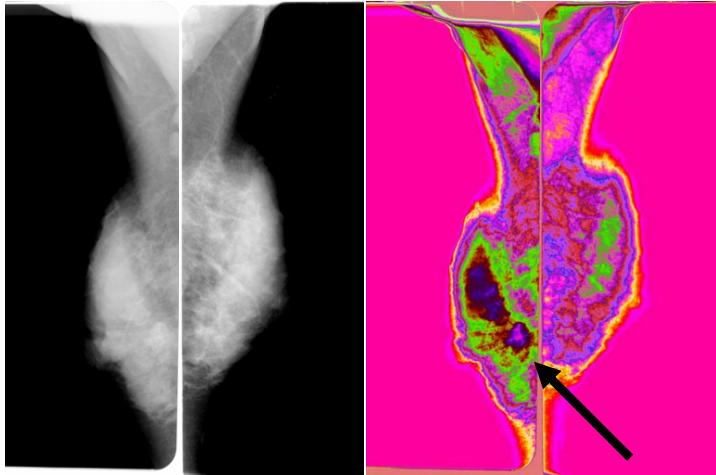
³ <http://www.who.int/mediacentre/factsheets/fs104/en/index.html>

⁴ Website: World Health Organization Statistics & Website: CureResearch.com

BREAST IMAGING

Signature Mapping applications for screening and diagnostic mammography imaging

Breast cancer is the second leading cause of cancer death in women in the US and worldwide. Over



Original Mammogram

Signature Mapping shows
cancer in left breast

180,000 new cases will be diagnosed in the US and over 40,000 deaths will result each year⁵. Screening mammograms are a low cost screening tool for early detection and GDTI estimates approximately 30 million women are screened each year in the US. Screening mammograms are very difficult to interpret due to the lack of intrinsic contrast in breast tissue combined with the clinical challenges in interpretation of dense or thick breast. These factors lead to large numbers of false positives and needless biopsies. GDTI cites a statistic that clinicians at USC indicated that as high as 50% of dense breast tumors could be felt, but not clearly seen or detected on x-rays. Typically, these dense breast areas obscure the visualization of anomalies and potential tumors. *Signature*

Mapping has been used to clarify difficult to visualize areas of the breast and to provide improved visualization and detection of tumor edges.

It can be observed in the example shown above that *Signature Mapping* visualization provides added clarification and delineation of tumor edges. It demonstrates the promise that *Signature Mapping* holds as a clinical tool to detect and segment tumors, even when they are obstructed by dense breast tissue. In addition, early results suggest opportunities for earlier detection and mapping of tumors onset. Microcalcifications, a precursor to cancer, were easily visualized and demonstrate unique signature responses. These outcomes are highly encouraging. Further clinical studies are in progress.

Because the GDTI software serves as a seamless, add-on complement to existing medical imaging approaches, and because the technology has applicability across a broad range of radiology imaging modalities, the potential market opportunity for *Signature Mapping* includes the global medical imaging equipment and PACS (picture archiving and communication) systems market. This market includes not only software associated with the sale of new equipment but also leverages investments made in equipment already in use.

⁵ Website: CureResearch.com & Website: American Cancer Society, fax and figures;
<http://www.cancer.org/downloads/STT/CAFF2007PWSecured.pdf>

A Convergence of Demographic and Economic Factors Driving Growth

“The medical imaging market consists of medical imaging systems, imaging information technology, and contrast agents and radiopharmaceuticals. Imaging systems include modalities such as x-ray, MRI, CT, PET, ultrasound and nuclear medicine systems. Contrast agents and radiopharmaceuticals are detected by imaging systems to generate medically-useful images. According to Frost & Sullivan, the U.S. imaging market was approximately \$11.2 billion in 2003 and represented approximately 43% of the global market. The imaging market is expected to grow 8.5% annually between 2003 and 2008, driven by expanding uses for imaging products, increased demand for digital imaging and the development of new contrast agents. Although sales of contrast agents are related to the number of imaging procedures performed, the contrast agents market is expected to grow more quickly than that of imaging systems, which require high capital investment and are only replaced as necessary. Total U.S. revenue of contrast imaging agents and radiopharmaceuticals in 2003 was approximately \$2.4 billion.”⁶

There are number of key considerations to highlight regarding the current state of the medical imaging market and the trends driving its growth:

- **Market Size.** Frost & Sullivan estimated the global medical imaging equipment market value at \$26 billion in 2003 with a forecasted 8.5% annual growth rate. Industry equipment sales likely exceed \$36 billion today. GDTI reports that Frost & Sullivan estimates global shares at 46% for North America, 26% for Europe, 18% for Asia, 10% for the Rest of World. GDTI also cites a Frost & Sullivan estimate of global radiology procedures at over 1 billion radiographic studies completed each year with an annual compounded growth rate of between 3% and 5%; with the United States accounting for between 300 million and 350 million procedures per year. With a target market that includes not only new medical equipment sales, but imaging systems and diagnostic workstations already in service, it is clear that there is a very large market opportunity for GDTI.
- **Demographics.** As Peter Drucker noted⁷, demographics represents the future that has already happened. Millions of baby boomers are reaching retirement age and it is difficult to imagine how healthcare demanded by this demographic can go anywhere but up.
- **Advances in healthcare.** Improved drug treatment therapies combined with earlier detection technologies will prolong and save lives - fuelling the demand for imaging services. It is reasonable to expect this upward spiral to drive demand for healthcare and the increase in the range of conditions to be diagnosed and treated.
- **Global economy.** Worldwide demand for more sophisticated and accurate diagnostic procedures is growing; patients around the world expect improved access to radiology

⁶ Covidien (NYSE: COV); Sec filing 10-12B 1/18/07;
<http://ccbn.10kwizard.com/cgi/convert/pdf/CovidienLtd1012B.pdf?pdf=1&repo=tenk&ipage=4603013&num=-2&pdf=1&xml=1&odef=8&dn=2&dn=3>

⁷ “The Future That Has Already Happened”; The Futurist Magazine; November 1998; www.wfs.org

tests, improved accuracy, better patient outcomes and overall better quality of healthcare. It is impossible to ignore the impact of the growing prosperity of the developing world, particularly India and China which together are home to over 1/3 of the world's population. Although the U.S still has the largest economy, our population now represents less than 5% of global population, and it seems reasonable to expect that as the masses of poor Indian and Chinese people increase their wealth, there will be an ongoing increase in healthcare demanded in these countries, as well as in other developing countries.

- **Healthcare Trends.** A number of clinical trends will impact the growth and demand for Guardian Technologies Signature Mapping software. In general, radiology procedural demand continues to have robust growth especially in the digital modalities such as CT, MRI and Ultrasound. Radiographic procedures have grown in their overall complexity as new technologies and innovations have been added to the radiology arsenal of diagnostic procedures. In addition, digital studies have seen a significant increase in the number of images per study, putting a major burden on the radiologists to read more procedures, which are more complex and have higher volume of images per study.
- **Increased Emphasis on Screening.** Early detection and assessment of therapeutic patient response has added to the complexity and range of demands placed on the radiologist. Emerging retail medical market and consumer demand for improved quality of diagnosis, lower cost improved access and better quality of care further challenge the radiology department. Growing shortages of trained and qualified radiologists will further exacerbate demand on the radiologists.
- **Healthcare economics.** With necessity as the mother of invention, rising costs and rising demand are driving changes in healthcare treatment and technology - treatment is being decentralized away from major hospitals and there is an increasing emphasis on outpatient and minimally invasive surgery. Additionally, any mention of healthcare costs must reference the impact of litigation and malpractice insurance. While these trends have a wide range of causes and potential effects, it is reasonable to expect that there will be an increasing demand for the early and accurate detection and diagnosis of medical ailments. As evidenced by Covidien's (NYSE: COV) expectation of stronger growth for its contrasting agent products than for its imaging systems, it is reasonable to expect that a heightened attention to early and accurate diagnostics will drive demand for products that complement medical imaging equipment, which is expensive to replace relative to complementary products that enhance the equipment's utility.

Battling With the Giants, Not Against Them

The medical imaging market is inhabited by some of the giants of global commerce – including GE Medical Systems, Philips Medical Systems, Siemens Medical Solutions, Bristol-Myers Squibb, Schering AG, Becton Dickinson, Toshiba, Eastman Kodak, Bracco, Covidien and others. Of course, it is not always the case that the largest businesses are the best innovators, and the *Signature Mapping* software is designed not to replace the equipment sold by these companies, but rather to be integrated into a digital imaging system and improve post-acquisition image analysis. Guardian's *Signature Mapping* technology is well positioned to take advantage of the market power of these major companies by enhancing their products' capabilities. *Signature Mapping* can be easily integrated into the imaging system or stand-alone workstation without major cost.

Example of Signature Mapping Computer Aided Detection for Lung Nodules in X-Rays Enhancing the Utility of a Conventional Diagnostic Approach



Conclusion: As outlined in the company's filings and in the disclosures and disclaimers noted at the end of this report, there are many risks and challenges faced by GDTI as it endeavors to execute its strategy for penetrating the medical imaging market. However, although operating in a space crowded with some of the world's largest companies, GDTI's *Signature Mapping* software has the potential to serve as a complement utility to both the medical imaging systems currently in service and to new equipment sales. Furthermore, with demographic and economic forces converging to heighten the focus on early and accurate detection and diagnosis, GDTI is targeting a large and likely rapidly growing

market opportunity. Guardian's *Signature Mapping* technology holds a tremendous opportunity to both improve diagnostic accuracy by providing earlier diagnosis and improve radiologists' reading efficiencies providing both a clinical and economic value to the healthcare community.

Please review the important disclosures and disclaimers at the end of this report

<p>Company Contact Information: Guardian Technologies International, Inc. Mr. Richard Borrelli, Vice President Phone 703-481-4861 info@guardiantechintl.com</p>	<p>Financial Communications Contact: Trilogy Capital Partners Mr. Ryon Harms, President Phone 800-592-6067 ryon@trilogy-capital.com www.trilogy-capital.com</p>	<p>Analyst Contact Information: Patrick J. Murphy, CFA Analyst Murphy Analytics Phone 636-273-9440 www.murphyanalytics.com pmurphy@murphyanalytics.com</p>
www.murphyanalytics.com	www.guardiantechintl.com	Page 7 of 8

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The Analyst for this report Patrick J. Murphy, CFA, has written independent research reports on microcaps and smallcaps in the energy, financial services, telecommunications, aquaculture and biotech sectors. In addition to his work with Murphy Analytics, Mr. Murphy also provides analytical services to a municipal derivatives advisory firm and a broker/dealer. His analysis draws upon 15 years of professional analytical experience that includes institutional asset management and transaction analysis, as well as public finance derivatives advisory and business development. Mr. Murphy has owned commercial real estate and small businesses, and has provided investment analysis in multiple asset classes including venture capital, public and private fixed income and equities, municipal derivatives, and commercial real estate finance. He is an alumnus of the University of Notre Dame (1991), with an undergraduate degree in Economics, and earned a Masters Degree in Finance from St. Louis University. Mr. Murphy is a CFA Charterholder and a member of the CFA Society of St. Louis.

I, Patrick J. Murphy, hereby certify that all views expressed in this report accurately reflect my personal views about the Company, and that no part of my compensation was or will be related to the views expressed in this report.