System for Controlling the Guidance of Biopsy Needles

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Technology description

Effectively Guides Needle Devices

This system offers control for the guidance of a biopsy needle. Medical professionals frequently use tomography and radiographic imaging methods such as X-ray and fluoroscopy to guide an advancing catheter to a specific target. Although the radiation doses received by patients and medical personnel in a diagnostic setting are low, their exposure to radiation during interventional procedures can reach alarming levels. Researchers at the University of Florida have developed a medical imaging system that minimizes ionizing radiation exposure. This new technology will enable precise, accurate tracking and guidance of biopsy needles while minimizing radiation exposure to both patient and medical personnel.

Technology

This medical imaging system consists of a computer controlled system for guiding a needle device, such as a biopsy needle, using computed tomography imaging (CTI), magnetic resonance imaging (MRI), fluoroscopic imaging, or 3D ultrasound system, or any combination of these systems. The 3D ultrasound system includes a combination of an ultrasound probe and both passive and active infrared tracking systems, enabling a real-time imaging display of the entire region of interest without probe movement. This new technology will facilitate more accurate and precise tracking and guidance of biopsy needles while minimizing exposure to ionizing radiation to both patient and medical personnel.

Application area

Three-dimensional guidance of needle device during diagnostic or interventional procedures

Advantages

Permits accurate, precise navigation of a biopsy needle while reducing or eliminating ionizing radiation exposure to the patient as well as medical personnel
Incorporates increased 3D guidance into diagnosis and interventional procedures, enabling the medical team to guide a biopsy needle more accurately and precisely to an optimal position

Enables the physician to better appreciate probe placement and anticipate required biopsy needle manipulations by providing guidance data in a virtual 3D environment
Eliminates the requirement for rigid body modalities to model anatomical targets, thereby allowing for effective modeling, high-precision biopsy, and radiation treatment of deformable anatomic regions
Efficiently engineered system enables medical facilities to perform interventional procedures requiring diagnostic radiology more rapidly, safely and economically, providing additional market potential

Institution

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