TECHNOLOGY

A Novel Discretely Actuated and Steerable Probe for Percutaneous Procedures

OVERVIEW

Background
In diagnostic and therapeutic medical procedures such as biopsy and radiofrequency ablation, a needle is used to reach a predetermined target. When flexible, bevel-tipped needles are inserted into soft tissue, they bend due to tip asymmetry, often resulting in targeting errors.

Innovative Technology
To improve steering precision in needles as well as hollow, flexible cannula, researchers at the University of Maryland have introduced discrete actuators along the length of the probing device. The probe (needle or cannula) can be bent in the required direction in real-time, allowing more areas of the body tissues to be targeted with greater accuracy. A shape memory alloy (SMA) based actuator would be well-suited for the device, with the potential for multiple actuators used at different locations along the probe. Electro-active polymer actuators might also be used. Probe steering can be done in real-time under several imaging modalities, including, but not limited to, Magnetic Resonance Imaging (MRI), Computed Tomography (CT), and ultrasound imaging.

Applications
Diagnostic and therapeutic medical procedures that involve guiding needles and other interventional devices through soft-tissue to target locations.

Advantages
-Corrects targeting errors that result from probe and soft-tissue interaction, probe bending, etc.
-Steers around obstacles in real-time
-Provides for greater efficacy in surgical procedures

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Contact OTC for licensing information

CATEGORIES

- Imaging devices
- Imaging

EXTERNAL RESOURCES

- US Patent 9,655,679

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