

Ultrasound Methods for Brain Imaging and Therapy

A focused ultrasound controller with real-time methods to localize, characterize, and control the cavitation activity for imaging, diagnosis, and treatment

Georgia Tech inventors have invented a focused ultrasound (FUS) controller system that uses microbubbles to enhance the treatment of brain diseases. This cost-effective system enables fast localization, characterization, and control while providing high-resolution mapping of vasculature without the need for MRI imaging. The technology provides cavitation control, which is crucial for safety and consistent therapy. This technology also enable fast volumetric imaging can be done tens of seconds as opposed to tens of minutes with alternative methods.

Summary Bullets

- **Cost efficient** – fast localization, characterization, and control minimize costs
- **Does not require MRI** – high-resolution mapping eliminates need for MRI imaging
- **Fast operation** – operation can be performed in minutes

Solution Advantages

- **Cost efficient** – fast localization, characterization, and control minimize costs
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Potential Commercial Applications

- Treatment of brain diseases
- Brain mapping and diagnosis

Background and More Information

Focused ultrasounds (FUS) mediated stable and inertial microbubble vibrations (acoustic cavitation), are associated with several bio-effects. One of these side effects is blood-brain barrier disruption, which enhances drug delivery to brain tissue. Microbubble are also excellent vascular agents that under controlled oscillation can be used to map out small vessels and flow in the brain and elsewhere. Unfortunately, existing commercial applications of these effects require MRI guidance, which is expensive.

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