Acousto-electromagnetic Imaging of the Brain

Technology #20150126

Neuroimaging Technology Integrates Focused Ultrasound with Electromagnetic Sensing

Acousto-electromagnetic imaging is a hybrid, multimodal neuroimaging technology that fully integrates focused ultrasound with electromagnetic sensing and imaging for mapping dynamic electrophysical (e.g., brain) activation. The noninvasive technology achieves neuroimaging of brain activity with high spatio-temporal resolution (i.e., mm spatial resolution and ms temporal resolution) and can detect and image dynamic brain activation and function at the neural circuit level in the brain as well as electrical activation in other organ systems (e.g., the heart).

High Temporal and Spatial Resolution

Existing neuroimaging techniques like electroencephalography (EEG) or magnetoencephalography (MEG) can map brain activation with high temporal resolution but suffer from very limited spatial resolution. Other functional neuroimaging, such as functional MRI, has high spatial resolution but limited temporal resolution. This first-of-its-kind acousto-electromagnetic neuroimaging provides the high spatial resolution of ultrasound while offering the imaging neural activation capability of EEG/MEG. As such, this transformative neuroimaging modality could have a profound impact on cognitive neuroscience research, clinical applications and diagnosing multiple neurological and mental brain disorders.

BENEFITS AND FEATURES:

- Integrates focused ultrasound with electromagnetic sensing and imaging
- Maps dynamic brain activation
- Noninvasive technology
- High spatio-temporal resolution (i.e., mm spatial resolution and ms temporal resolution)

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APPLICATIONS:

- Neuroimaging
- Functional neuroimaging
- Cognitive neuroscience research
- Clinical applications
- Diagnosing neurological and mental brain disorders
- Brain imaging for preventing, diagnosing or treating neurological and/or brain disorders (e.g., epilepsy, Parkinson’s Disease, deep brain stimulation, pain, depression, dementia)
- Cardiac activity imaging to guide catheter ablation or other clinical interventions

Phase of Development - Concept

Interested in Licensing?

The University relies on industry partners to scale up technologies to large enough production capacity for commercial purposes. The license is available for this technology and would be for the sale, manufacture or use of products claimed by the issued patents. Please contact Kevin Nickels to share your business needs and technical interest in this brain imaging technology and if you are interested in licensing the technology for further research and development.

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