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Sensory Stimulation to Entrain Brain Rhythms in Deep Brain Regions

Category: Neurotechnology

Contact: Kashmira Kulkarni Phone: 470-303-2350

Summary

This technology utilizes auditory and visual stimuli to non-invasively entrain specific neural rhythms within deep brain structures, addressing diseases characterized by altered rhythmic activity such as Alzheimer's, Parkinson's, and epilepsy. It represents a novel approach to brain stimulation, capable of reaching areas beyond the scope of current non-invasive methods.

Development Stage

Prototype Complete

Problem Statement & Solution

Neurological disorders like Alzheimer's, Parkinson's, and epilepsy often involve disrupted neural rhythms, posing a challenge for treatment using traditional brain stimulation methods that struggle to reach deep brain structures accurately and non-invasively. Current technologies lack the temporal precision needed for effective stimulation of specific neural circuits, leaving a significant gap in treatment options for these conditions.

Researchers at the Georgia Institute of Technology have developed a novel brain stimulation technology that utilizes auditory and visual stimuli to non-invasively entrain specific neural rhythms within deep brain structures. This approach addresses the need for new therapies that can precisely target and modulate brain activity, offering a promising alternative to existing treatments and enhancing the quality of life for patients with challenging neurological conditions.

Advantages

- Non-invasive, avoiding the risks associated with surgical interventions.
- Capable of reaching deep brain regions previously inaccessible by non-invasive technologies.
- Simple to implement, using auditory and/or visual flicker to drive neural activity.
- Has potential therapeutic applications in a range of neurological and psychological diseases.

Commercial Applications

- Non-invasive therapies for diseases like Alzheimer's, Parkinson's, schizophrenia, and epilepsy.
- Research tools for studying the causal effects of specific neural rhythms on brain function and disease.
- Potential applications in treating neurodegenerative diseases by recruiting the brain's immune system.
- Approaches for controlling brain inflammation, protein, and gene expression non-invasively.

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Lead Inventor: Annabelle C Singer, PhD

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