Docket #: S19-551

Kinematic Controller for Adaptive Deep Brain Stimulation to Mitigate Gait Impairment

Gait impairment and freezing are two of the most significant symptoms of Parkinson's disease which can be treated via deep brain stimulation. Researchers in the Bronte-Stewart lab have developed a kinematic controller algorithm to modulate the frequency used in deep brain stimulation treatments to better treat patients. Lower frequency stimulation is better suited to treating gait impairment and freezing, while higher frequencies are better suited towards rigidity and tremor symptoms. This controller assesses gait trends in real-time to adapt stimulation frequencies and restore proper gait function.

Related Technology: Stanford Docket 19-550: "Algorithm for Local Field Potential Burst Duration Detection in Adaptive Deep Brain Stimulation"

Stage of Research

- Prototype

Applications

- **Movement disorders such as Parkinson's**
- Electrical stimulation to alleviate signs and symptoms

Advantages

- **Adaptive to patient's movement state**

Publications

- O'day et al. The turning and barrier course reveals gait parameters for detecting freezing of gait and measuring the efficacy of deep brain stimulation PLOS One (2020)
- O'day et al. Demonstration of Kinematic-Based Closed-loop Deep Brain Stimulation for Mitigating Freezing of Gait in People with Parkinson's Disease IEEE (2020)

Patents

- Published Application: 20220241591
- Issued: 12,109,417 (USA)

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