Docket #: S19-550

Algorithm for Local Field Potential Burst Duration Detection in Adaptive Deep Brain Stimulation

The Bronte-Stewart lab has designed an algorithm for calculating neural activity burst duration to better manage closed loop deep brain stimulation in patients with Parkinson's disease. Bursts of neuronal oscillatory activity are related to worsening signs and symptoms of Parkinson's. For example, prolonged burst durations are connected to gait freezing symptoms. Deep brain stimulation (DBS) devices for treating Parkinson's currently rely on continuous stimulation throughout. Some attempts at adaptive stimulation rely on fast fourier transform computation, but this is slow in real-time and is computationally expensive. The algorithm from the Bronte-Stewart lab overcomes these challenges by monitoring for burst activity and calculating its duration. This allows for adjusted stimulation levels to improve therapeutic efficacy and could potentially mitigate gait freezing episodes.

Stage of Research

- Prototype

Applications

- **Adaptive deep brain stimulation for Parkinson's disease**

Advantages

- **Less computationally expensive**
- More responsive in real-time than current control mechanisms

Publications

- Petrucci, M., et. al. A Closed-loop Deep Brain Stimulation Approach for Mitigating Burst Durations in People with Parkinson's Disease IEEE 2020

Patents

- Published Application: 20220241594

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