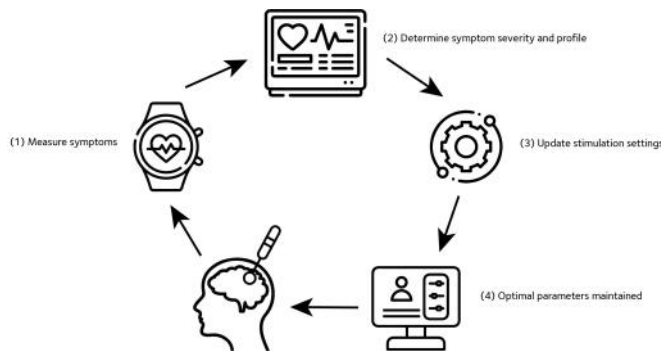


# Adaptive neurostimulation: A real-time optimisation algorithm to enhance neuromodulation therapies

Algorithm fine-tunes brain stimulation therapies in real-time, adapting to changes like disease progression and body rhythms. This personalised approach can enhance treatment effectiveness for conditions such as Parkinson's and chronic pain.

**Applications:** Invasive and non-invasive neuromodulation therapies, such as Deep Brain Stimulation and Transcranial Magnetic Stimulation



| Features                                                                                       | Benefits                                                                                                                                 |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Algorithm provides dynamic adaptation to patient-specific changes                              | Provides personalised, real-time optimisation of therapy settings                                                                        |
| Time-varying Bayesian optimisation (TV-BayesOpt) considers the time-varying nature of symptoms | Continuously adjusts to align with daily biological rhythms and disease progression                                                      |
| Inputs can be driven by either a peripheral or central disease biomarker                       | Reduces reliance on trial-and-error from manual parameter setting based on the limited snapshot provided in daytime clinical assessments |

| Features                                                                                         | Benefits                                                                                                                                        |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Direct measure of symptom severity and stimulation efficacy                                      | Makes adjustments informed by current data, minimising the impact of outdated information                                                       |
| Prioritisation of recent patient data                                                            | Refines therapy delivery over time, leading to superior symptom control compared to static or manually adjusted methods                         |
| Continuous performance enhancement                                                               | Can enhance treatment effectiveness for conditions such as Parkinson's and tremor, as well as emerging areas where neurostimulation is relevant |
| Relevant for all conditions currently considered for brain stimulation or peripheral stimulation |                                                                                                                                                 |

## Awaiting patent and Available for

- Co-development
- Consulting
- Licensing

To find out more, contact [enquiries@innovation.ox.ac.uk](mailto:enquiries@innovation.ox.ac.uk) and quote the project number.

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