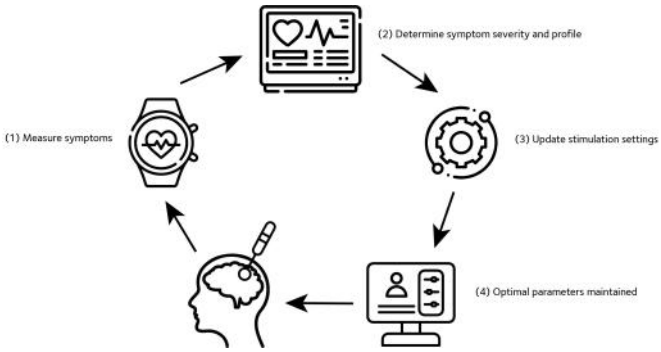
PROJECT NUMBER

21242

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of symptom severity and stimulation efficacy	Makes adjustments informed by current data, minimising the impact of outdated information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 and quote the project number.

The above information is provided ‘as is’ without conditions or warranties. Oxford University Innovation makes no representation and gives no warranty that it is the owner of the intellectual property rights in the technology described. © Oxford University Innovation Ltd 2026, Buxton Court, 3 West Way, Oxford, OX2 0JB.