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CAP SLEEP TRACKING SYSTEM

Fully automated Cyclic Alternating Patterns (CAP) scoring technology with applications in sleep tracking

Benefits

- Fully automated CAP scoring technology that also includes conventional sleep staging capability
- Robust and time saving - hours of manual scoring is reduced to a few minutes also eliminating subjectivity.
- High fidelity CAP scoring - sensitivity: 75%, accuracy: 91%, specificity: 94%, and F1-score: 69%, significantly outperforming existing methods.
- Can be readily integrated in existing hospital or in-home sleep scoring systems or used to accelerate consumer sleep analysis systems.

Background

Cyclic Alternating Patterns are recurrent, transient events in the human brain activity during NREM sleep. They are characterized

by cyclic sequences of cerebral activation (phase A) shorter than 1 minute followed by periods of deactivation (phase B) which separate two successive phase A periods.

Electroencephalography (EEG) is a non-invasive technology to record electrical activity of the human brain. In addition to sleep diagnostics, it allows detecting improper functioning of the brain, e.g. epilepsy, stroke and brain tumours. EEG devices typically record electrical activity of the brain from the scalp; recent advances focusing on consumer health include ear-based sensors.

Technology overview

Our novel system is fully automated, exploiting the dynamical, temporal information in EEG recordings for the classification of A-phases. The system uses a recurrent neural network to extract crucial information in the temporal behaviour of EEG. The automatic classification system is equipped to deal with the biasing issue of imbalanced data sets, and uses state-of-the-art signal processing methods to reduce the inter-subject variation.

Opportunity

- Clinical trials
- Exclusive and non-exclusive licensing opportunities.

IP status

PCT WO 2020/248008 A1 - A METHOD AND SYSTEM FOR CLASSIFYING SLEEP RELATED BRAIN ACTIVITY.

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FURTHER ENQUIRIES

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