



Thesis Project Form

Title (tentative): Unraveling the pathophysiology of idiopathic REM sleep behavior disorder

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Description

Motivation and application domain

Idiopathic REM sleep behavior disorder (iRBD) is considered a prodromal stage of alpha-synucleinopathies. Indeed, patients with iRBD have a 70% chance of developing parkinsonism/dementia within 10-15 years. Previous studies observed an abnormal glucose metabolism before the development of parkinsonism/dementia. Other studies reported changes in electroencephalography activity in iRBD patients with disease progression. A link between abnormal glucose metabolism and altered EEG activity could provide new insights into the pathophysiology of iRBD.

General objectives and main activities

The main objective of the project is to investigate whether changes in electroencephalographic activity correlate with abnormal metabolic patterns. To this end, the project will involve several activities: (i) preprocessing of EEG signals; (ii) computation of EEG measures to evaluate brain synchronization and brain dynamics; (iii) source reconstruction analysis to observe electroencephalographic changes in specific brain networks; (iv) comparison of electroencephalographic activity with abnormal glucose metabolism.

Training Objectives (technical/analytical tools, experimental methodologies)

1. Background literature analysis
2. EEG preprocessing
3. Development of the pipeline to perform a source reconstruction
4. Data analysis in Python/MatLab

Place(s) where the thesis work will be carried out: DIBRIS - Pad. E

Additional information

Maximum number of students: 1