MSc project

Title:
"Sleep, Awake & Move" in patients with Parkinson's disease (A collaboration between DTU, Danish Center for Sleep Medicine, Rigshospitalet, Glostrup, and University of Applied Arts and Sciences of Southern Switzerland (SUPSI), Lugano, Switzerland)

Introduction:
A substantial proportion of patients with Parkinson's disease (PD) report prominent spontaneous, transitory improvements in motor function after night-time sleep and before taking the first dose of dopaminergic medications. This phenomenon is known as "sleep benefit" (SB). In the Awake & Move study, we are exploring the effect of nocturnal sleep on motor function in a group of PD subjects undergoing two non-consecutive full video-polysomnographies coupled with bilateral wrist actigraphy (triaxial accelerometer, light and temperature sensors) at the sleep lab of the Neurocenter of Southern Switzerland in Lugano. Twenty-four patients were included in this study. This document is a proposal of an ancillary analysis which will be held in collaboration with the Technical University of Denmark, Department of Electrical Engineering, the Danish Center for Sleep Medicine and the University of Applied Arts and Sciences of Southern Switzerland (SUPSI) in Lugano.

Objectives:
1. To fine-tune for PD patients an open source algorithm of analysis of actigraphic signals to estimate sleep and wakefulness in these patients.
2. To validate the above-mentioned algorithm against video-polysomnography.
3. To explore the validity of our newly developed algorithm to detect abnormal behaviors during sleep (REM behavior disorder, pseudo-REM behavior disorder) based on machine learning techniques.

Supervisors:
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Prerequisities:
Experience with Matlab and R, signal processing and machine learning is required.

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