

PhD project

Using deep learning methods to tailor sleep scoring to specific populations

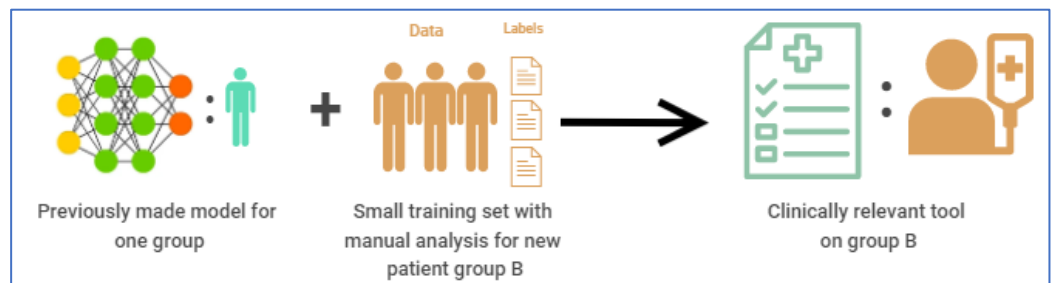
Research area and project description

In recent years, great progress has been made in developing algorithms for automatic sleep scoring. This is a societal good, because low-cost sleep scoring will benefit many different branches of health care.

However, sleep scoring is also an interesting ‘model problem’ for developing new methods in signal analysis. Large data bases for training and testing exist, and the problem is both complex and important. An exciting challenge is the fact that training data is not equally distributed among patient groups, and some groups, particularly those that are hardest to score, have relatively little training data.

In this project, the candidate will develop and test approaches to ‘transfer learning’ or ‘semi supervised learning’, in which high performing algorithms trained on large data sets will be transformed to perform similarly well on smaller data sets for rarer types of sleep recordings.

The developed methods can be used for regular, clinical sleep recordings, but an important task will also be in testing the methods for data recorded using the “ear-EEG”



platform, which has been developed in our group. In general, the methods developed in this project will likely be relevant for most mobile sleep monitoring platforms, of which there are a growing number.

Qualifications and specific competences

The successful applicant should have a strong quantitative background (i.e., bachelor’s or master’s degree in engineering, physics, mathematics or similar), and an interest in either machine learning, neuroscience, brain computer interfaces or biomedical engineering in general. The project is expected to entail a great deal of work with conventional deep learning libraries (tensorflow, pytorch or similar), so experience with those and/or scientific programming tools (matlab, python, R, C/C++) is a definite advantage.

Given the explorative nature of scientific research, an interest and willingness to learn new skills is an important quality – perhaps even more so than the specific skillset held by the applicant at the time of application.

Our group works in a collaborative and explorative fashion. This means that good communication skills, both written and oral, are important to carrying out the everyday work.

At the time of writing, the group consists of 1 full professor, 2 assistant professors, 2 post docs and 4 PhD students, spanning 5 different nationalities.

Practical details

The place of employment is Aarhus University, and the place of work is Department of Electrical and Computer Engineering, Finlandsgade 22, 8200 Aarhus N. The project is scheduled to start in fall 2021, with some flexibility allowed.

Contact

Applicants seeking further information are invited to contact:

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