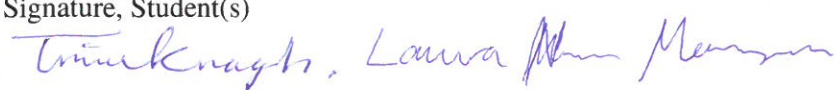


<b>Application for Thesis Contract – Autumn 2019</b>	
Name(s) and Cpr.no.: <b>Trine Nyholm Kragh – 210794 1862</b> <b>Laura Nyrup Mogensen – 120495 1078</b>	
Specialisation: (tick off the relevant specialisation) <input type="checkbox"/> Mathematics <input type="checkbox"/> Mathematics-Economics <input checked="" type="checkbox"/> Mathematics-Engineering	
Supervisor(s): <b>Jan Østergaard, Rasmus Waagepetersen</b>	
Collaboration with a company or alike:  Company Contact Person:	
Project title: <b>Bayesian Dictionary Learning for EEG Source Identification</b>	
Number of ECTS: <b>60</b>	
Starting: <b>September 1, 2019</b>	Submission deadline:
Description of the thesis (100-200 words):  <b>The thesis will investigate state of the art methods such as Covariance-Domain Dictionary Learning (Cov-DL), and Multiple Measurement Sparse Bayesian Learning (M-SBL) with respect to identification of source localisation matrix <math>X</math> and mixing matrix <math>A</math>, given some electroencephalography (EEG) measurements <math>Y</math>, to solve the so called EEG inverse problem <math>Y = AX</math>, where we have more sources (<math>N</math>) than sensors (<math>M</math>), an over-complete system (<math>N &gt; M</math>).</b>  <b>We will propose an algorithm which uses the investigated methods on synthetic EEG data and real EEG data. Further, the purpose is to extend the algorithm to perform in real-time on EEG data.</b>  <b>With the proposed algorithm some experiments with EEG equipment will be conducted on site. The purpose is to analyse the results in different sound environments such as noisy and noise-less cases and cases of directional noise.</b>  <b>The overall purpose of the real-time performance is to provide results that can be useful to the hearing aid industry, considering the development of self-adaptive hearing aids. By this extension and associated analysis we seek to extend the existing results within the area.</b>	
Signature, Student(s) 	
Signature, Supervisor(s) 