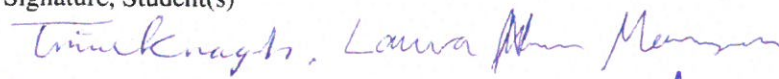


Studienævn for Matematiske Fag

Application for Thesis Contract – Autumn 2019	
Name(s) and Cpr.no.: Trine Nyholm Kragh – 210794 1862 Laura Nyrup Mogensen – 120495 1078	
Specialisation: (tick off the relevant specialisation) <input type="checkbox"/> Mathematics <input type="checkbox"/> Mathematics-Economics <input checked="" type="checkbox"/> Mathematics-Engineering	
Supervisor(s): Jan Østergaard, Rasmus Waagepetersen	
Collaboration with a company or alike: Company Contact Person:	
Project title: Bayesian Dictionary Learning for EEG Source Identification	
Number of ECTS: 60	
Starting: September 1, 2019	Submission deadline:
Description of the thesis (100-200 words): <p>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 X and mixing matrix A, given some electroencephalography (EEG) measurements Y, to solve the so called EEG inverse problem $Y = AX$, where we have more sources (N) than sensors (M), an over-complete system ($N > M$).</p> <p>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.</p> <p>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.</p> <p>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.</p>	
Signature, Student(s) 	
Signature, Supervisor(s) 