

Linz, 20/4/2022

**Opponent review for the Bachelor Thesis: 'Feature Engineering for Spike Sorting'
written by Arnold Ackerlauer**

'Feature Engineering for Spike Sorting' is a bachelor thesis that focuses on extracting features from neuronal recordings for spike sorting applications.

Spike sorting is an unsupervised clustering technique that classifies neuronal action potentials based on their waveform shape. Usually there are no labels for such a task and the different neuronal groups are not known a priori. In this work, Arnold Ackerlauer examined various time-domain features using synthetic time-series generated based on real recorded spikes. This enabled the use of supervised classification approaches in an attempt to detect informative features that could be linked to the different neuronal populations firing in the vicinity of the electrodes. The purpose of this work was mainly exploratory. Mr. Ackerlauer examined different signal characteristics and feature selection techniques (simple ANOVA approach vs Random Forest feature importance) and his results are in line with previous literature. His thesis is well-written and well-organized. He addresses diligently all the main research questions. A more detailed state of the art would be optimal.

All in all, the thesis meets my criteria and I am pleased to recommend it for ACCEPTANCE:



Carl Böck, Institute of Signal Processing