Reviewer's report

Title: Predicting progression of mild cognitive impairment to dementia using neuropsychological data: a supervised learning approach using time windows

Version: 1 Date: 12 Apr 2017

Reviewer: Anette Hall

Reviewer's report:

The manuscript looks at predicting progression from MCI to dementia within 2-5 years using different time windows and comparing that to the commonly used first last approach where time to dementia is not taken into account. The models are trained using Cognitive Complaints Cohort, with 516 patients, which are cross-validated and tested with a separate set of 115 patients recruited from a different site belonging to the same cohort.

While predicting MCI progression is a popular topic, exact time windows for this have not been so widely studied, so the research question here is relevant. However, the manuscript would benefit from adding clarifications and editing specifically to the methods and results sections.

1. Methods is quite detailed concerning model building. There are four figures describing the process, which seems a bit excessive. I would recommend dropping out figures 1 and 4.

2. The subsection Settings (page 11) and Table 3 should be a part of Methods, not Results. Consider also moving the first part of Results (page 10) to Methods.

3. The Correlation based feature selection should be explained in much more detail. How does the method work in principle? How many original variables were there and how many were selected? What variables were dropped out? Were there any key differences between the features selected for the different time windows?

4. The Coimbra validation part is explained in much less detail than the cross-validation. There should be a table of the results, similar to Table 5. Also, did you test, if the feature
selection also had a positive effect to these validation results, not only the cross-validation?

5. Figures 5 and 6 describe the same results for cross-validation and independent validation. For the sake of enabling comparison, these could be combined in a single figure.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published
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