OPPONENT RECORD

Thesis compiled by Fredrick Chaine

Title of thesis: Classification of Electroencephalographic Signals for Brain-Computer Interference.

Opponent: Mitra Khorsand

Was it easy to understand the underlying purpose of the project? Comments.

Yes, the purpose was to examine and compare different techniques for classifying electroencephalography (EEG) data and the introduction gave a good description of the project and its goals.

Do you consider that the report title justly reflects the contents of the report?

No, the title only describes that the project will classify the EEG data, when it actually is more focused on evaluating and comparing different classification techniques. The title should have addressed that comparison.

How did the author describe the project background? Was there an introduction and general survey of this area?

The abstract and the introduction gave a concise description of the scientific area and the upcoming needs. This part was very interesting and easy to understand.

To what degree did the author justify his/her choice of method of tackling the problem?

The author did not reason enough about how he chose the three techniques that were compared. Neither did he mention if there were other techniques available. In the best case there should have been a discussion about all techniques that could have been used (including the ones that were not chosen in the end), and that discussion should have led to the final choices. But at least, there should have been some hints about other techniques and why they were discarded.

Did the author discuss the extent to which the prerequisites for the application of such a method are fulfilled?

Regarding the comparison of techniques, no prerequisites were given.

Is the method adequately described?

Some parts of the method were well described, for example the mathematical theorems were described in detail. But other parts of the method were not very well described. As mentioned above, the choices of the three kernel functions were not discussed in the text at all. The conclusion is that the quality of the method text varied. Some parts were described in great detail, others just briefly mentioned.

Has the author set out his/her results clearly and concisely?

The results were presented in diagrams which were elegant and organized. However it was hard to analyse and draw your own conclusions because of non-concise formats. You were given little ability

to compare the data of the different techniques. A summary of values of each diagram would have been really helpful.

Do you consider the author's conclusions to be credible?

The outcome of the comparison was quite straight forward, the third technique seemed to be the best, and this was what the conclusion stated. Therefore the conclusion seems credible.

What is your opinion of the bibliography? What types of literature are included? Do you feel they are relevant?

They were relevant but too few. For a project like this, the number of references desired, is greater than four.

Which sections of the report were difficult to understand?

The methodology part, because some sections were poorly described and that made it hard to follow the reasoning.

What are the stronger features of the work/report?

The introduction was good, because it was well written and easy to understand. Also, the parts of the methodology, that in detail described mathematical theorems, were strong. They were thoroughly described and well sectioned.

What are the weaker features of the work/report?

The parts of the methodology that were just briefly described, as mentioned earlier, and also the conclusion because it was sparse and could have been more developed.

What is your estimation of the news value of the work?

Since I am not very familiar with this subject I have a hard time evaluating how ground breaking the conclusion of this work is.

Summarize the work in a few lines.

The work was a comparison of three different techniques for classifying electroencephalographic (EEG) signals derived from tests on humans. The three techniques compared were the perceptron, the multilayer perceptron and the support vector machine. The conclusion of the comparison was that the support vector machine was the best at classifying EEG signals.

Questions to author:

1. Are there other alternative techniques for classifying EEG signals than the ones you've chosen?

- 2. If so, how did you decide on the three used in your paper?
- 3. Are there any similar papers written on this subject and what was their result?
- 4. Your reference list is very short, how come?

5. Your last sentence states that it is possible to train individuals to shape brain signals. How do you go about to do that?

6. If you were to carry on this project and do more detailed study, what would be the next step?