PRELIMINARY BRAIN COMPUTER INTERFACE DESIGN BASED ON MOVEMENT PLANNING

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Abstract

The design of a Brain Computer Interface (BCI) has to be carefully considered. Experimental factors which might influence thought processes must be taken into consideration. This poster outlines our BCI design based on detecting movement planning. Our novel BCI design uses a gaming paradigm as its central concept.

Any BCI system designed to classify Electroencephalogram (EEG) data on-line must take into acount the effect of human brain plasticity, i.e. the ability to learn. One way to utilise this change in behaviour is to present the subject with information about how well the predictor in the system is performing. This is referred to as biofeedback.

Designing the BCI data collection system around a *game scenario* presents us with an intuitive method of channeling feedback to the subject. This change in paradigm will allow the study of the effects of biofeedback in its different forms, in a realistic environment, in a manner consistent with the eventual environments in which the BCI system is likely to be utilised.

This shift in paradigm gives several advantages over cued and selfpaced methodologies [GSN + 01]. It is intuitive to the user. Most people are now familiar with gaming enviroments and so require no additional training. The design of the game can make the system more engaging and help to focus the subject's mind on the task in hand.

We present an overview of the experimental protocol and setup under development. The aim is to, wherever possible, reduce experimental factors that can affect the thought processes of the subject from whom movement planning data is being collected [BB98, RER + 99]. We also give details of the prediction models under consideration [RGRed, GSN + 01].

References

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