Online submission form

Title: Measuring EMG and EEG simultaneously to determine the EMG pollution in the EEG during a variety of tasks.

1. The purpose of this project is to measure brain and muscle activity, for use in various brain computer interfaces such as games, cars, toys and medical applications. This study follows up on previous research conducted by Dr Bernd Porr at the Southern General Hospital in converting brainwaves into auditory information, therefore allowing distinguishable differences between anaesthetised and awake patients. Brain activity, recorded by using Electroencephalography (EEG) and Electromyography (EMG) result in similar spectrums and the EMG recording can pollute the EEG signal, meaning that if the EMG reading were rigorously filtered then a purer EEG signal can be analysed leading to a better signal unaltered by surrounding muscles and therefore more accurate equipment for brain interface technology, this being the main purpose of the project.
2. This project is funded through the University of Glasgow as part of the undergraduate teaching.
3. The potential applicant will enter the laboratory and will be asked to lie supine while standard electrodes, used to record EEG/EMG, will be placed on the applicants forehead (frontal lobe) chin (lower mandible) and behind the ear (photograph/drawing of electrode placement can be given on request) in order to obtain the data needed. The process for the application of these electrodes is standard, the skin is initially wiped by with an alcoholic wipe to clean the skin contact surface, an electrode conducting gel is applied to the skin before the electrode is placed over it. This is to maximise the conductivity of the surface, reducing unwanted interference. After this process the data is ready to be collected. The potential applicant is then asked to perform several tasks, firstly from a supline position the participant will be asked to read text and the perform a number of movement tasks in five second intervals, these being clenching teeth, raising eyebrows, frowning, smiling, moving head side to side and some artefact tests. Then from a sitting position the participant will be asked to perform some simple puzzle and gaming tasks, Sudoku puzzles, crosswords and online games. None of these tasks are in any way dangerous or at a risk to the participant and the tests will be exactly the same for each participant. The data obtained is then collated, processed and analysed through MATLAB. The experiment will last maximum one hour.
4. This procedure is non intrusive and the participant will feel no adverse or beneficial effects from the conducting of these tests.
5. In our opinion the ethical concerns are minor, the participant will be able to conduct the tasks in their own time and under close supervision from the supervising investigator. If the subject requires special requirements, this will be met to the best of our ability. The subject can stop the experiment at any time.
6. Participants will be found through advertising or through personal contacts. All participants will be over the age of eighteen and are therefore competent to give consent. The tests are not gender, age, ethnic, racial, ideological or sexually specific. The tests will not be carried out on people with mental disabilities and participants will be healthy individuals however proof of this from their general practitioner is not necessary.
7. Payments will not be given to the subject for this study.
8. Advertising will be done through the university teaching office and by personal advertisement on social media sites. Consent forms will be signed by the participant before the tests commence.
9. This ethical proposal will meet all requirements in the BPS code of conduct.
10. Although the participants name will be kept on the consent form, which will be obtained by the investigator, it will only be available on request and will not be used in the study. The names will not be connected to the data and will be kept mutually exclusive. The results of this study might be used for a journal submission, might be used for online publication on a web page and the anonymised data might be made available to other researchers. Pictures/videos might be taken from the subjects during the experiment but only with their consent.
11. The study will commence as soon as possible and will finish in March 2014.
12. The study will be conducted in a designated laboratory (R909/R910) inside the Rankine building on Oakfield Ave within the University of Glasgow.
13. Before the commencement of the tests, the participants will be given the following: a copy of their consent form, a document detailing what the experiment is, the method of the tests to be conducted and the contact information of the investigator and supervising investigator. This allows the participant to have follow up discussions, seek information or issue complaints post study.