University of Glasgow | College of Science & Engineering

COLLEGE OF SCIENCE & ENGINEERING

TEMPLATE ETHICS APPLICATION FORM

1. DESCRIBE THE BASIC PURPOSES OF THE PROPOSED RESEARCH.

To create an online public database of electrocardiograph (ECG) recordings in realistic movement scenarios and to benchmark heartbeat detection algorithms.

2. INDICATE WHO IS FUNDING THE RESEARCH (IF COMMERCIALLY FUNDED, ENSURE THAT PARTICIPANTS ARE INFORMED).

The project is going to be financially supported by Glasgow University's internal funding for MEng projects.

3. DESCRIBE THE DESIGN OF YOUR EXPERIMENT (E.G. CONDITIONS, NUMBER OF PARTICIPANTS, PROCEDURE AND EQUIPMENT WHERE APPROPRIATE).

The electrocardiogram (ECG) is the process of recording the electrical activity of the heart over a period of time using electrodes attached to the skin. The small electrical changes on the skin that arise from the heart muscle's electrophysiologic pattern of depolarising and repolarising during each heartbeat will be detected by the electrodes.

The aim of this project is to create realistic test data to assess the performance of heartbeat detection algorithms while the subject is moving. The spectrum of motion artefacts usually overlaps with ECG signals and changes in different movement conditions such as walking, jogging and running. Therefore, in these conditions, many heartbeat detection algorithms may prove ineffective.

Equipment

The ECG recording device will be the Attys (www.attys.tech) which is CE marked and is a wireless Bluetooth device which guarantees electrical isolation. Two Attys will be used: one connected to a Taope electrode chest strap and the other connected to standard 50mm round paper electrodes with cables. This allows the impact of cable movement on the recording to be investigated.

Procedure

The experiment will take place in in James Watt South, room 363 and will run as follows:

1. The participant will put on the chest strap and electrodes, a changing room is available for this purpose. The paper electrodes will be attached as follows: one on the right shoulder, one on the left shoulder and two on the left hip. The Attys will then be connected.
2. 120 second ECG recording, sitting down
3. 120 second ECG recording, timed maths questions
4. 120 second break
5. 120 second ECG recording, walking on treadmill at 4 kph
6. 120 second break
7. 120 second ECG recording, hand bike
8. 120 second break
9. 120 second ECG recording, jogging on treadmill at 8 kph
10. Electrodes and chest strap will be removed from participant

If the participant consents, a video recording of the subject will also be made during the movement and will form part of the database. This video will allow artefacts in the data to be identified and labeled. The video will be anonymised by pixelating the face of the participant and removing the sound.

We aim to recruit a minimum of 15 and a maximum of 30 subjects.

The recorded data will be stored on the university open access database.

4. DESCRIBE HOW THE PROCEDURES AFFECT THE PARTICIPANTS.

The participants will not undergo any change in their diet or day-to-day activities because of the test. During the test, a chest strap will be worn, and four electrodes attached to the skin: one on the right shoulder, one on the left shoulder and two on the left abdomen. They will be asked to perform some task and their ECG will be recorded.

5. STATE WHAT IN YOUR OPINION ARE THE ETHICAL ISSUES INVOLVED IN THE PROPOSAL.

The ethical concerns are minor as it is a non-invasive test. It is known that the ECG has been measured in many different situations and will not affect the subject. The subjects will be allowed to complete the tests in their own time and if they do not wish to undertake or complete it, they may withdraw at any point in time. Close supervision of the subject is ensured at all times by the project supervisor. Subjects will be accommodated for any special requirements or needs they may have. As the research data will be made publicly available online, additional care will be taken to ensure subjects are aware of this information.

6. SPECIFY THE NATURE OF THE PARTICIPANTS. INDICATE IF THE RESEARCH INVOLVES CHILDREN OR THOSE WITH MENTAL DISABILITIES OR HANDICAP. IF SO, EXPLAIN THE STEPS TAKEN TO OBTAIN PERMISSION FROM L.E.A.s, HEADTEACHERS, PARENTS, ETC. GIVE A BRIEF DESCRIPTION HERE AND FILL IN THE CHILDREN RESEARCH ETHICAL PLAN. THE FORM MUST BE UPLOADED TOGETHER WITH THE CONSENT AND INFORMATION FORMS.

The test is restricted to adults (>18yrs) only. Participants should be healthy individuals. The test is not gender specific.

7. STATE IF PAYMENT WILL BE MADE TO SUBJECT.

No payment or incentives are to be given to the participants.

8. DESCRIBE THE PROCEDURES FOR ADVERTISING, FOR RECRUITING PARTICIPANTS, AND FOR OBTAINING CONSENT FROM PARTICIPANTS.

Potential participants will be recruited by personal contact or with the help of advertisements. Social media will be used to share information regarding participation.

Each prospective participant will be provided with an information sheet and a consent sheet. This will clearly explain the purpose of the project, what they will be asked to do and how their data will be used.

We aim to recruit a minimum of 15 and a maximum of 30 subjects.

10. DESCRIBE HOW THE PARTICIPANTS' ANONYMITY AND CONFIDENTIALITY WILL BE MAINTAINED.

There will be no personally identifiable data, therefore anonymity and confidentiality will be maintained. The ECG files will be given non-identifiable numbers and if the participant opts in to the video recording the video will be anonymised. To ensure subjects are fully aware their data will be made public, significant notice will be given on the information and consent sheet.

11. DATE ON WHICH PROJECT WILL BEGIN AND END.

The project will start on October 15th, 2018 and will end on December 21st, 2018.

12. LOCATION AT WHICH THE PROJECT WILL BE CARRIED OUT.

The tests will be conducted in James Watt South, room 363.

13. DESCRIBE HOW PARTICIPANTS WILL BE DEBRIEFED AT THE END OF THE EXPERIMENT (THIS MUST INCLUDE THE OPPORTUNITY TO CONTACT THE EXPERIMENTER - OR SUPERVISOR - FOR FEEDBACK ON THE GENERAL OUTCOME OF THE EXPERIMENT).

At the end of the experiment, the participants can get back to the experimenter or the supervisor if they have some questions in mind or if they intend to give their feedback about the experience and the outcome of the experiment.