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**INFORMATION SHEET**

**1. Study Title: EMG removal from ECG with deep neural networks**

**Investigator(s):** Dr. Bernd Porr, [Students: Ramon Suwanban], School of Engineering, University of Glasgow

**2. Invitation:**

You are invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Contact us if there is anything that is unclear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

**3. Purpose of the study:**

The main purpose of this study is to provide statistical evidence to prove the use of deep neural network to effectively clean electromyography(EMG) out of electrocardiogram(ECG) signal.

EMG is the electrical signal initiated from the nerve cells associated with various muscles of human body. It is considered noise to other bio-signal recording because local EMG will unavoidably be picked up along with the desired bio-signal with electrodes.

ECG is the electrical signal initiated from the nerve cells associated with heart muscles. It have unique characteristic waves. Many heart diseases are detected from the abnormality of the waves.

**4. Why would your participation be useful?**

Your participation in this study will help provide statistical data proving the work of deep neuronal network in filtering EMG out of ECG signal. The deep neuronal network then will be applied to other applications, such as EMG removal from EEG.

**5. Do you have to take part?**

Taking part in this experiment is completely voluntary. You are not required to participate. If you decide to take part in this experiment but later change your mind, you are free to leave the experiment at any time without needing a reason and without any consequences.

**6. Procedures:**

You are requested to participate in an experimental session ideally lasting no more than 1 hour.

Initially, you will be asked to have three one-time-use electrodes placed on your right wrist, right shoulder, and left hip to record ECG and EMG of the right forearm. Consequently, Attys, a portable data acquisition device will be attached to your abdomen with a belt. Next, some wires will be used to connect the electrodes and the device. You will be asked to lay relaxed and still for clean ECG to be recorded. Finally, you will be asked to conduct right forearm muscle contraction in some of the recordings. Multiple recordings, ideally 12, will be taken. Each recording should take about 2-4 minutes. You may ask for a 5 minutes break at anytime.

**7. Possible Risks:**

There is no identifiable risk involved in ECG and EMG recording. There may be slight discomfort due to the weight of electrodes, wires, and the recording device attached to your body. There may also be tickling sensation while removing the electrodes after the recording is completed.

Any equipment used is approved by the appropriate medical device associations.

**8. What if something goes wrong?**

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone’s negligence, then you may have ground for legal action but you might be required to pay for it.

**9. Publication of Results:**

Participants will be given an individual number and will only be referred to by this number in any published articles/data. This will be such that the participant cannot be identified from the data published.

Results from this experiment may be published online and/or in journals. If you consent to having your videos taken, this may be published along with the results. However, the video will be pixelated on the participant’s face to ensure your identity is not revealed. You are not required to have your videos taken. However, by doing so, you will help us to identify any artefacts that might happen during the recording which helps in data analysis.

**10. Who has reviewed this study?**

This study has been reviewed and approved by the Ethics Committee of the College of Science and Engineering at the University of Glasgow.

**11. Contact for Further Information:**

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**Thank you very much for considering participation in this study.**

**Participants will be given a copy of the Information Sheet and a signed Consent Form to**

**keep.**