**STUDY INFORMATION AND CONSENT FORM**

**Title of Study:** Performance assessment of a myoelectric deep sensing hand prosthesis

**Principal Investigator**: Hossein Rouhani, Faculty of Engineering (780 492 8344)

**Study coordinator:** Leonardo Torres, Faculty of Engineering (780 232 7107)

This information sheet is only part of the process of informed consent. It should give you a basic idea of what the research study is about and what your participation will involve. If you would like more detail about something mentioned here or information not included here, please ask. Please take the time to read this carefully and to understand any accompanying information. You **will receive a copy** of this form for your records.

**WHAT IS THE REASON FOR DOING THE STUDY?**

This study aims to design a low-cost and multi-functional prosthetic hand. The first goal is to use muscle activity sensors for grasp classification and with the final goal of hand prosthetics development.

In addition, individuals with amputation cannot sense the environment with the current developed prosthetic hands. Hence, adding an artificial sensing mechanism will enable them to sense the environment by transferring the sensed force at fingertips to their arm skin. This study tries to develop the most effective transitional function to transfer force information as vibrations on their arm skin.

## WHY AM I BEING ASKED TO TAKE PART IN THIS RESEARCH STUDY?

Based on a rich dataset collected from able-bodied individuals. We invite you to take part in this research study because **you are an able-bodied person who can perform multiple hand grasps.** And, we will collect your data (muscle activation, vibration motors, force sensors, and hand positions sensors) to build models for relationship between hand motion, fingertip force and its sensation. Before you decide to participate in this study, one of the researchers will review this form with you. You **can always ask questions** if you need a better explanation or more information.

## WHAT WILL I BE ASKED TO DO?

We will book you an appointment in the Neuromuscular Control & Biomechanics Laboratory (NCBL). You will be asked to read this consent form and once you are satisfied, sign it before enrolling you in the study. The NCBL is located at the Mechanical Engineering Building, MECE 4-9, University of Alberta. During the experiment, you will be asked to wear several muscle activity sensors, motion sensors, and vibration motors for the study. The experimental equipment will be placed on your hand and arm skin.

The muscle activity sensors require shaving your skin and using a hypoallergenic double-sided tape as previous preparation. The vibration motors will apply a small amount of force on your skin, same as the vibration that your phone could apply. However, this might feel like your arm is tingling.

You will do two sessions of tests: First, the EMG classification, the EMG sensors and motion capture markers and sensors will be mounted on your skin and the muscle activity and hand positions and record several grasp configurations, e.g., pinch, power, and tripod. Second, you will wear a glove that contains force sensors on the fingertip. Also, vibration motors, muscle activity sensors, and motion sensors and markers are placed on your skin. For different object grasp tasks muscle activity and hand and wrist motion will be collected and vibrations will be applied on your skin. The whole duration of experiment is 2 hours containing experimental setup and performing the main experiment. Each test session takes about 25 min where between sessions we have considered 10 min for rest.

## WHAT ARE THE RISKS?

This experimental study is a low risk, and its risk is not more than normal life and daily activities. However, it is not possible to know all risks that may happen in a study, but we have taken all reasonable safeguards to minimize any known risks to you.

Wearing the sensors may cause slight skin redness. It might cause skin irritation or an allergic reaction to the tape material in some people in a very rare situation. If you notice any unusual redness or skin irritation, please stop wearing the sensors and immediately contact the study coordinator.

**WHAT ARE THE BENEFITS TO ME?**

You **may not get any direct benefit** to participate in this research study. However, this study will benefit the human society by helping individuals with amputation to regain part of their abilities to do some of their daily activities. In addition, it provides them a chance to afford a low-cost prosthesis with multiple hand grasps and different functionalities.

## WHAT HAPPENS IF I AM INJURED BECAUSE OF THIS RESEARCH?

This is a low-risk experimental study and the research team have studied the risks of this experiment in different conditions and designed the experiment to minimize such risks. However, if you become ill or injured as a result of being in this study, you will receive the necessary medical treatment at no additional cost to you. By signing this consent form, you are not releasing the investigator(s), institution(s) and/or sponsor(s) from their legal and professional responsibilities.

## DO I HAVE TO TAKE PART?

No, you do not have to take part in this study. The participation is **voluntary**. You can ask to stop the experiment at any time during the study if you feel that you cannot continue or do not want to continue. You may choose not to take part or to withdraw your consent at any time **without penalty** or **loss of benefits** to which you are otherwise entitled. It will **in no way jeopardize** your health care.If you are studying or working at the University of Alberta and choose not to take part or withdraw your consent, **no one** on the University of Alberta campus **will be told**. If you decide to withdraw from the study, the research team may **analyse** the information collected up to that point and used it for the study, unless you make a request to remove or destroy the information.

**WILL MY INFORMATION BE KEPT PRIVATE?**

All of the information collected will remain strictly confidential. Your privacy will be assured. Only the investigators of this study and the University of Alberta Research Ethics Board will have access to this information. No data relating to this study that includes your name will be released or published by the researchers.

All data will be kept in a secure, either locked or password-protected location after completion of the study. If you decide to withdraw from the study, the research team may analyse the information collected up to that point and used for the study, unless you make a request to remove or destroy the information.

## WHAT IF I HAVE QUESTIONS?

If you have further questions about matters related to this research, you can contact Hossein Rouhani (primary investigator) at 780 492 8344 (hrouhani@ualberta.ca). If you have any questions about your rights as a participant in this study, you may contact the **Health Research Ethics Board**, University of Alberta at **reoffice@ualberta.ca**. This office has no affiliation with the study investigators.

**How do I indicate my agreement to be in this study?**

By signing below, you understand:

* That you have read the above information and have had anything that you do not understand explained to you to your satisfaction.
* That you will be taking part in a research study.
* That you may freely leave the research study at any time.
* That you do not waive your legal rights by being in the study
* That the legal and professional obligations of the investigators and involved institutions are not changed by your taking part in this study.

**SIGNATURE OF STUDY PARTICIPANT**

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Name of Participant

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Signature of Participant Date

**SIGNATURE OF PERSON OBTAINING CONSENT**

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Name of Person Obtaining Consent Contact Number

**SIGNATURE OF THE WITNESS**

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Name of Witness

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Signature of Witness Date

A copy of this consent form has been given to you to keep for your records and reference.