Human to Human Interface

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Introduction

Human- Human interface is a technology allowing us to control another person's movements (to some extent that is) and take away their free will.

The basics of this interface is that the brain sends electrical impulses to the muscles to move and the movement created in the muscles amplifies this electrical signal which is transferred by means of an artificial path to another person's nerve, in this case the ulnar nerve below the skin of the forearm, so that we are able to control their movement.

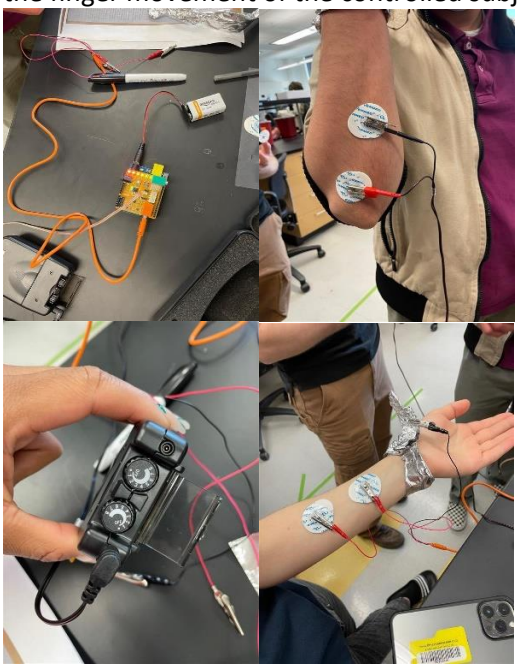
What this tells us is that even if the brain has lost connection with remote muscles due to spinal cord injury we are still able to remotely control and activate a muscle or even a prosthetic in the case of an amputation or other spinal cord injuries.

Methods and materials

To execute the Human-to-Human Interface lab procedures, the following materials were used for technological setup: Arduino, SpikerShield ,9V Battery with Leash, TENS 3000 Device, Muscle Leads, Vermed Electrode Pads, Muscle-TENS Cable, USB Cable, Piece of foil.

Brain of HHI includes SpikerShield and Arduino that already has an uploaded code which is powered by the 9V battery and cables are used to connect TENS 3000 and Arduino setup to electrode pads that are placed on the skin surface.

The setup of the controller subject includes placing two electrode pads at the intersection of the lateral and medial antebrachial cut of the dominant arm within 2-3 cm. The piece of foil is also used to be wrapped around the wrist of the subject to ground the voltage. The setup of the controlled subject includes placing two electrode pads on the medial antebrachial cut of the arm close to the elbow within 2-3 cm of each other. The controller subject squeezes their arm to initiate the signal that will cause the finger movement of the controlled subject.



Results

We successfully connected the H-to-H interface and experimented with different signal intensity, applied force, and controller/controlled participants. We found that both increasing the TENS device gain and the applied force resulted in greater nerve stimulation in the controlled user. Placing the electrodes closer together provided greater signal intensity, but less range of motion.

Conclusion

Through this experiment we were able to control movements on one another. This was done using an electrophysiology setup in which our brains sent electrical impulses to our arm muscles telling them to move. When our muscles moved, a large electrical signal was generated and transferred to the nerves controlling the second person's arm. This was due to the incoming signal overriding the controlled subject's nervous system, forcing them to move due to the electrical commands, emphasizing the importance of electrophysiology.