

# Human-Human Interface

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with assistance from Samuel Carpenter

Photos by Bill Griesar

# Equipment

## 1. Electrodes

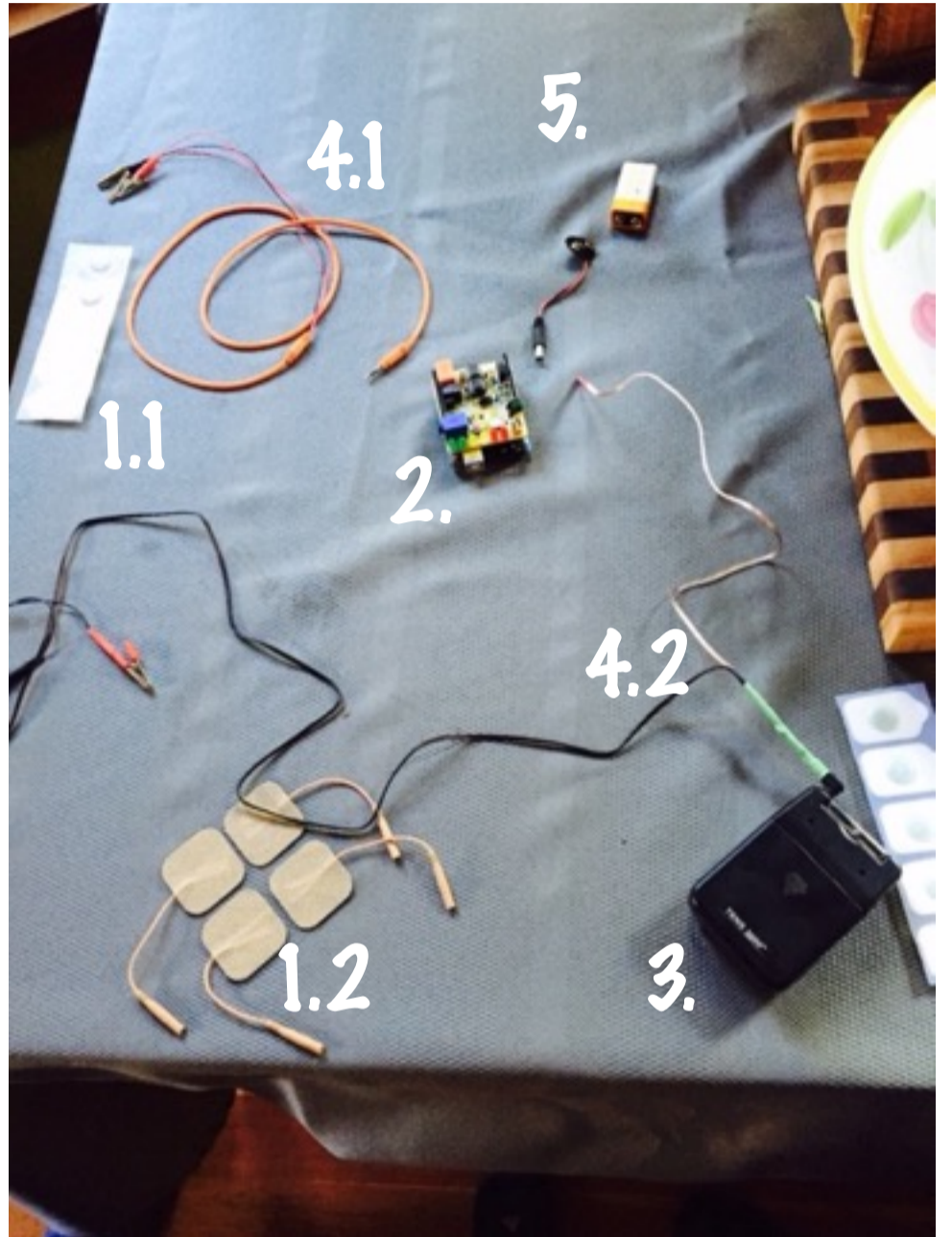
1.1. Input (white disposable)

1.2. Output (tan reusable)

## 2. Arduino

## 3. TENS unit

## 4. Cables



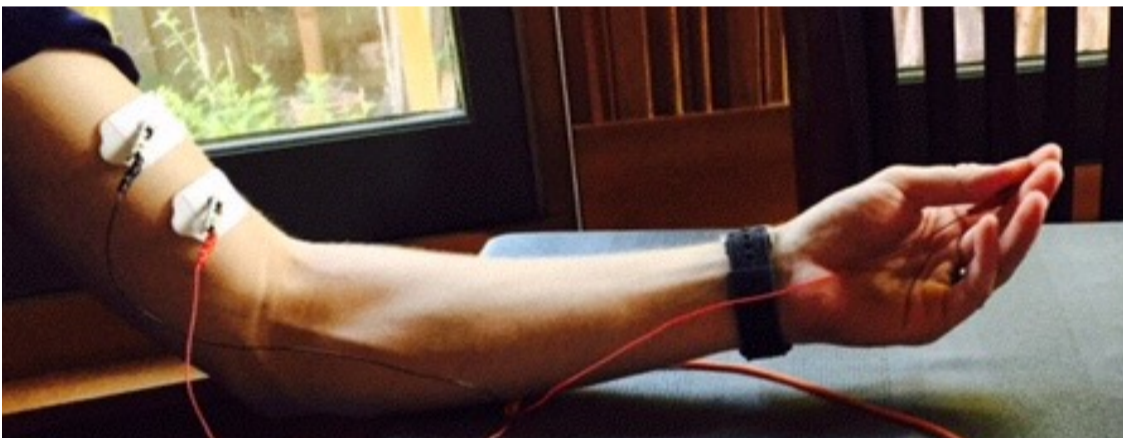
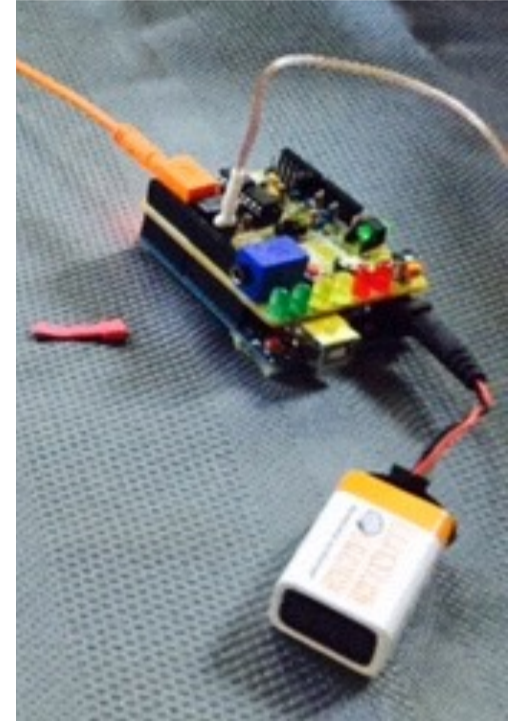
4.1. Input: Orange cable w/ 3 alligator clips (2 red & 1 black)

4.2. Output: Green coated plug, black cable w/ 2 alligator clips and 1 small forked plug w/ red cap

5. Battery (9 volt) & battery cable

# Steps

1. Attach the battery to the Arduino via the battery cable
2. Attach the input electrodes to the other subject's bicep (one black & one red) and have them hold the other red clip in their gently closed hand
3. Plug the orange cable into the Arduino
4. Press the White button on the Arduino to set the baseline activity coming from the bicep



5. Ask the subject to flex their bicep as strongly as they can
  - 5.1. This should make the LED lights on the Arduino light up. If they do not light up, ask the subject to continue flexing and turn the Orange knob on the Arduino to the right until some of the lights come on.
  - 5.2. If the lights still do not come on, repeat Steps 3 and 4. If you still don't get any lights, ask the subject to gently move the clip in their fist and that should get some activity.

# Steps

6. Plug the green wrapped end of the output electrodes in the TENS unit

1. Remove the alligator clips from the end of the electrode, exposing a metal pin (this goes into the output electrodes)

7. Place the output electrodes on the subject as shown (over the ulnar nerve)

8. Uncap the red capped prong and plug it into the Arduino

9. Dial up the TENS unit to 1 and then press the Red button on the Arduino.

1. This should send a small shock to the subject. If the subject is comfortable, dial up to 2 and press the Red button again.

2. Repeat this process until the subject's fingers clench when the Red button is pressed, but do not exceed 4 on the dial.

10. Now ask the first subject to flex their bicep or move the clip in their hand. This should send the signal to the Arduino which relays the message to the TENS unit which then shocks the second subject.

