HOWTO: Build your Xth Sense biophysical wearable sensor v0.1

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Time required: from 1 up to 4 hours (depending on your skills and practice).

1. Make sure you have all parts and components (see Parts list).

2. Cut the matrix board in order to comfortably fit the box, but bear in mind the board has to be big enough to accommodate all the components.

3. Solder the circuit following carefully the schematics. You can solder everything except the flexible audio cable. We'll do this later on.

4. Using a suitable drill, make 2 holes in the plastic box.
   One hole is needed for the flexible cable to reach the circuit inside the box; this can be done on the longer side of the box.
   Another hole is needed to fit the jack socket, thus it has to be bigger enough and well centered on the side of the box; this can be done on the shorter side of the box.

   Always check the best location for the holes and the jack socket by inserting the circuit inside the box __BEFORE__ making the holes.

5. Cut a 1m long flexible cable (or longer, depending on which parts of the body you want to use).

6. Accommodate the cable through the hole you previously drilled and solder the voltage and ground cables to the circuit according to the schematics.

7. Now position the circuit inside the box and fix the jack socket into its hole.
   Make sure you can close the box!
   Sometimes the jack socket might be slightly higher then the height of the box. If so, just cut away a small piece of the box cover so that you can close the box.

8. Prepare the velcro bracelet.
   Cut two velcro stripes (one with the hooks and one with the loops) about 10/15cm long (this can be adjustable to the diameter you need).
   Sew them together, but REMEMBER NOT TO SEW a small part (about 3/4cm) of one of the sides of the bracelet (at about 1/4 of the whole lenght of the bracelet), AND cut out a small corner at one end of the bracelet.

   You will need those holes to be able to embed the cable into the bracelet.

9. When the bracelet is ready, make a small hole on the loop side of the bracelet; the position of the hole should be at about 1/3 of the whole lenght of the bracelet. We will use this hole to embed the microphone.

10. Take the free end of the flexible cable, and insert it in between the two sides of the bracelet. Let the flexible cable come out of the not sewed part of the bracelet.

11. Solder the microphone pins to 2 wires (about 3/4cm long).
    REMEMBER which pin is the ground and which is the voltage!!!
    See the microphone specification sheet (included in this package).
    (alternatively you can use a suitable micro socket, although those are not easy to find and they might be too loose to accommodate properly the microphone).

12. Take the wires you just soldered to the mic and insert them through the hole you made on the velcro loops.

13. Now you should have:
    on one side, the free end of the flexible cable running through the velcro bracelet;
    on the other, the jumpers soldered to the microphone inserted into the bracelet.
    Open up the free end of the flexible cable and solder voltage and ground wires to the two microphone wires.
    Again: REMEMBER which pin is the ground and which is the voltage!!!
    See the microphone specification sheet.

    SOLDER THE CABLES INSIDE THE BRACELET!

14. You're almost done. Isolate each electric cable separately , by applying some black tape on the soldered part. Isolate also the microphone pins separately.

15. Place the silicon case on the microphone, make sure that the microphone is as much static as possible. More the mic is moving, less accurate is the signal.

    IMPORTANT: it is crucial that the microphone is located in the middle of the silicon case.
    If the mic is too high it will touch your skin, and this is bad because the mic does not work with contact. If the mic is too low inside the silicon case, the muscle sound will be very quiet.

16. Insert the battery into its battery holder, close the box, you're done!!