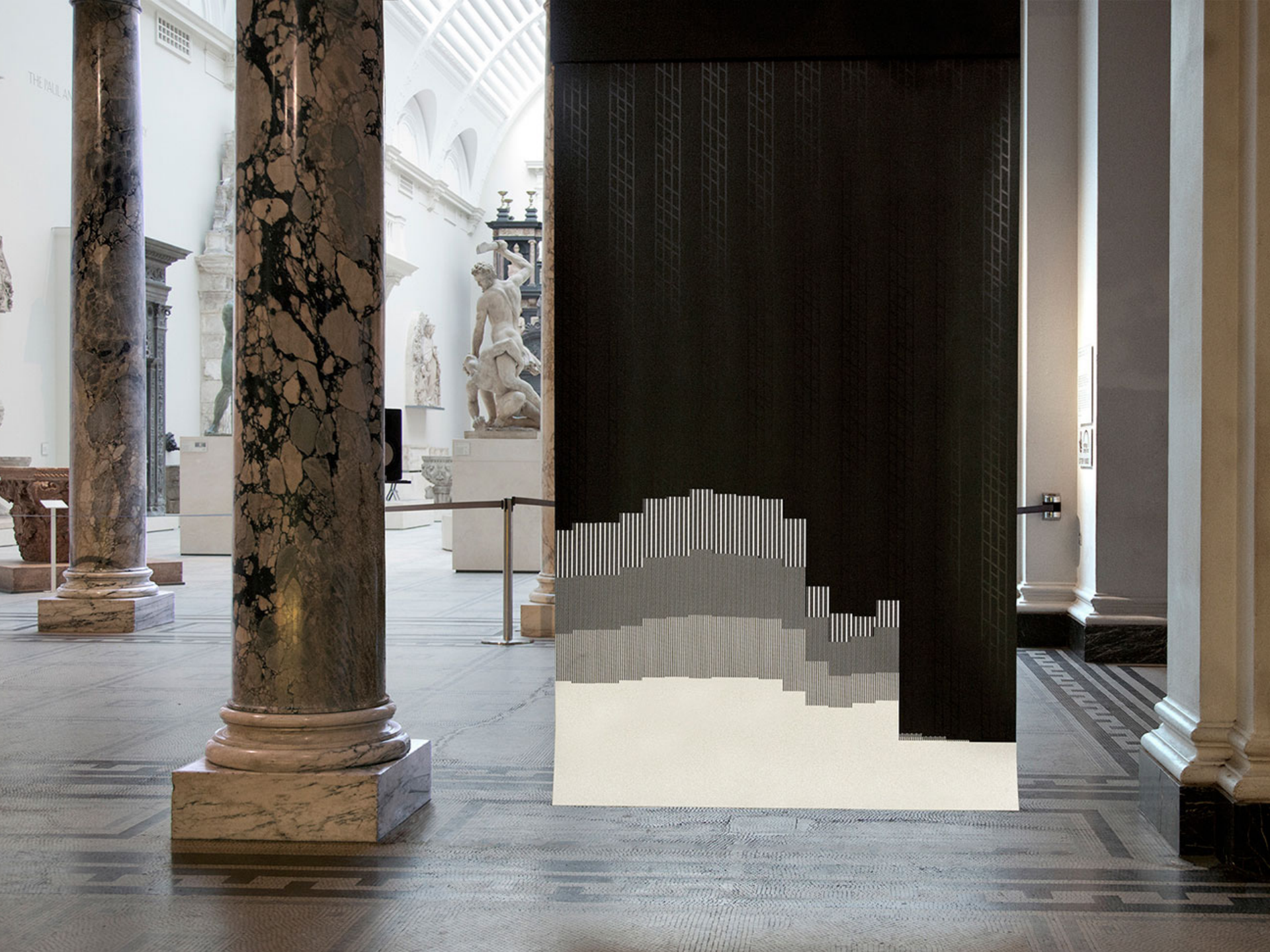
Contours by artist **Fabio Lattanzi Antinori** and **Alicja Pytlewska** was installed in the MAK Museum, Vienna, in 2013. It was created using two metre-long pieces of Tyvek fabric, which was screen printed with Electric Paint and controlled by the Touch Board. The printed sensors reacted to the presence of a person and triggered an ambient soundscape composed in real time. The Tyvek was printed in three stages, an initial layer of Electric Paint to create the sensors, a layer of nonconductive back ink to conceal the sensors, and finally a gold print on the back. In technical terms, the only electrically active layer of material was the ten sensors printed on each sheet using Electric Paint.

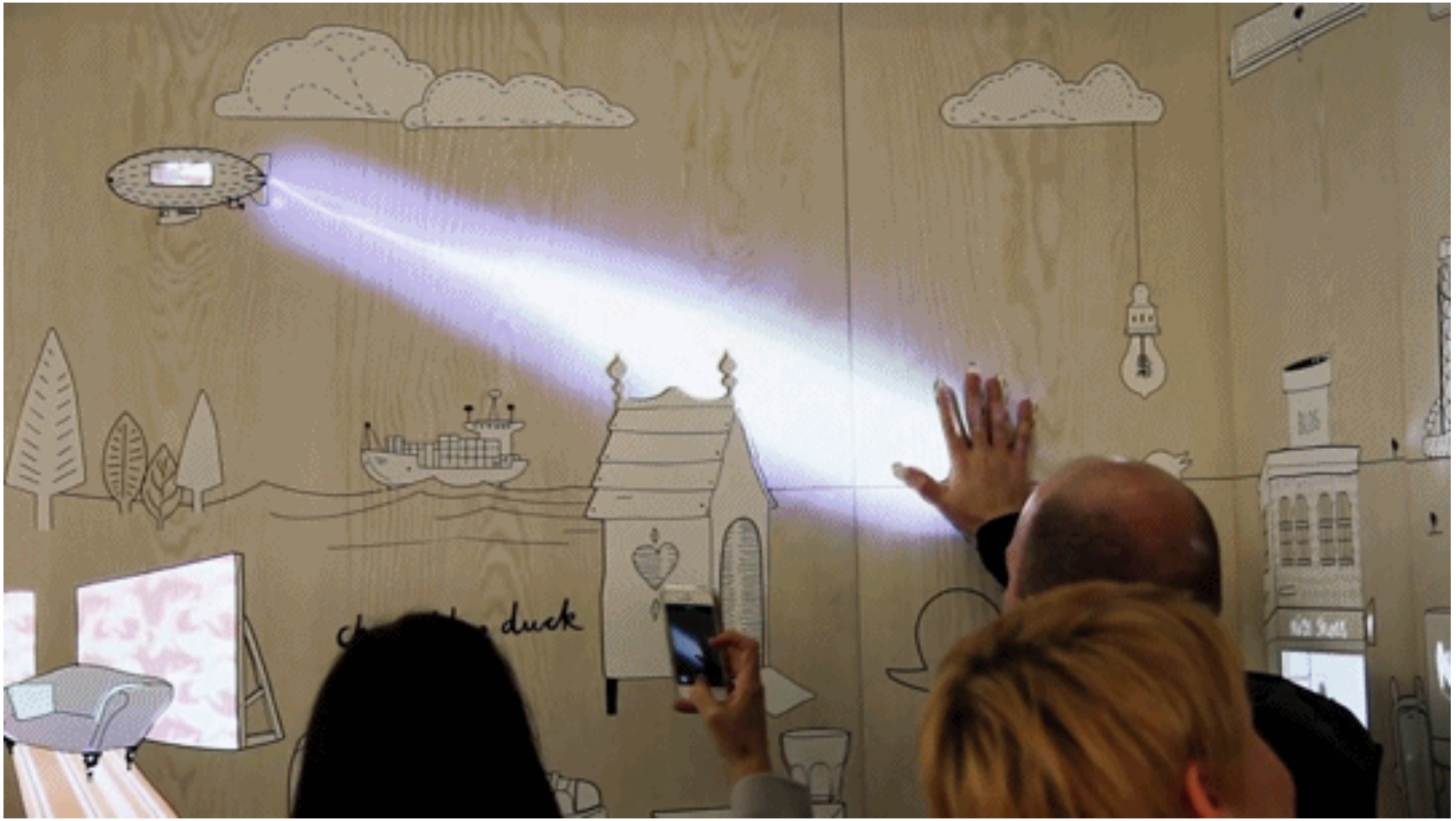
http://fabiolattanziantinori.com/Contours.php https://player.vimeo.com/video/79820006



Art and Decibels by Thomas Evans

Integrates Electric Paint and capacitive sensing into his oil paint.

Storytelling with Conductive Ink



Dalziel + Pop (creative agency)

- Interactive display using screenprinting with conductive ink.
- When visitors touch any of the 48 elements, up to 100 possible light animations activate.

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D-CS
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ICSP
TOUCH ELECTRODES
BARE CONDUCTIVE
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GND
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RESET
3.3V
5V
POWER
GND
5V
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A3
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A5
ANALOG IN
GND
RESET

Workshop plan

- Overview
- Connect to electrodes
- Electric Paint
- How to Change samples
- Distance sensing
- Touch board and Arduino
- Programming using the Arduino IDE
- MP3 player v Midi
- Make a midi piano

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MP3 RST
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TX
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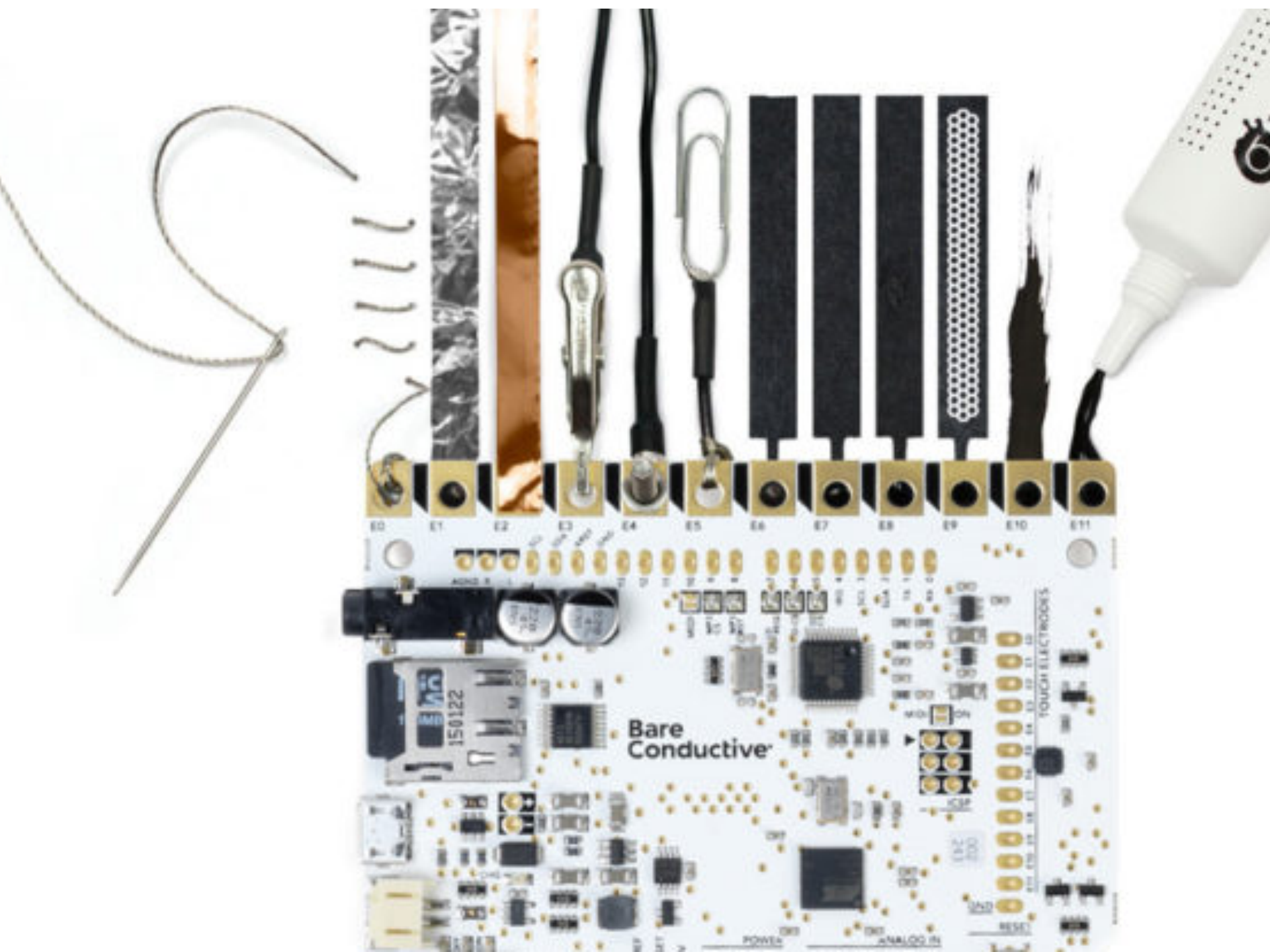
ANALOG IN
GND
RESET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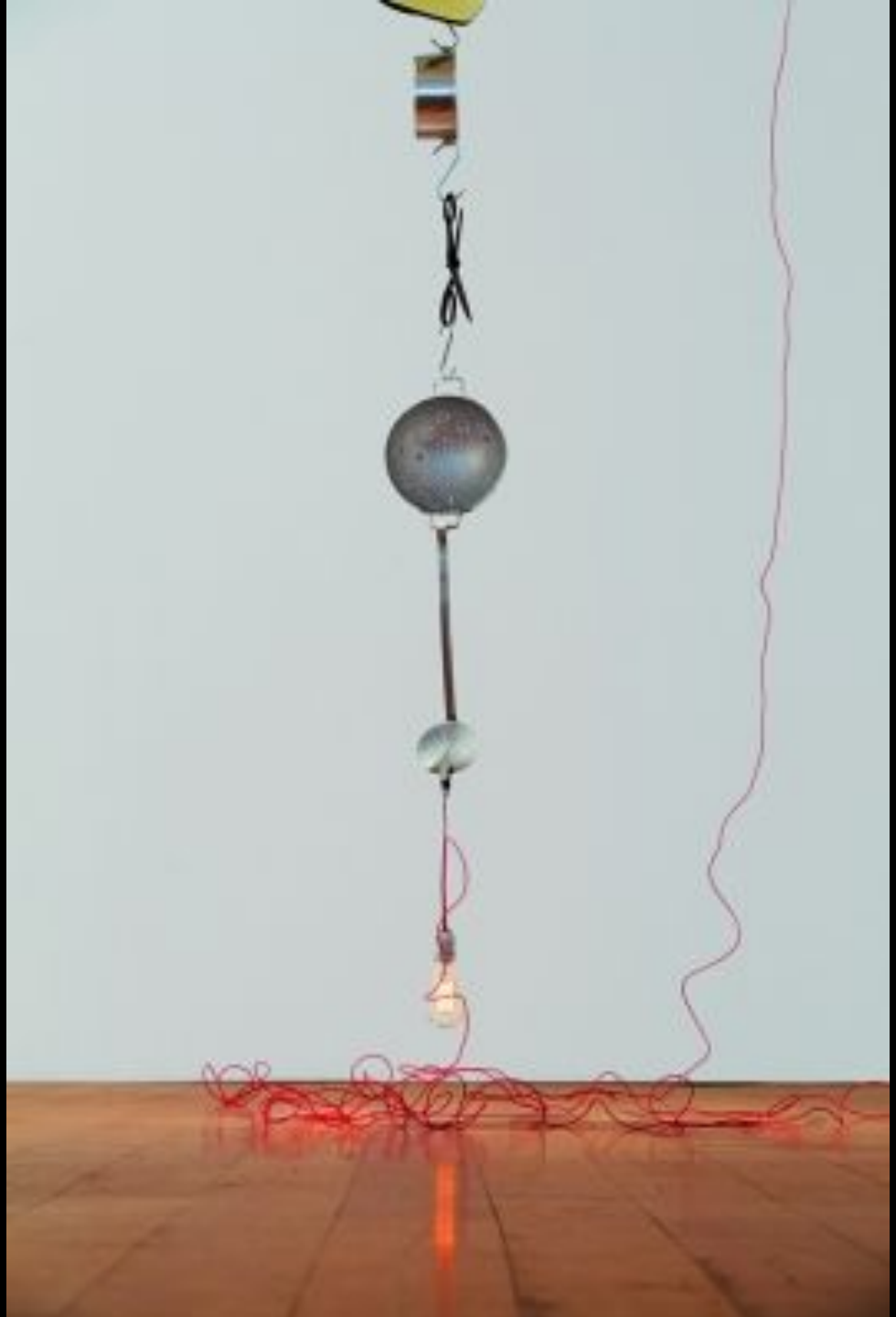
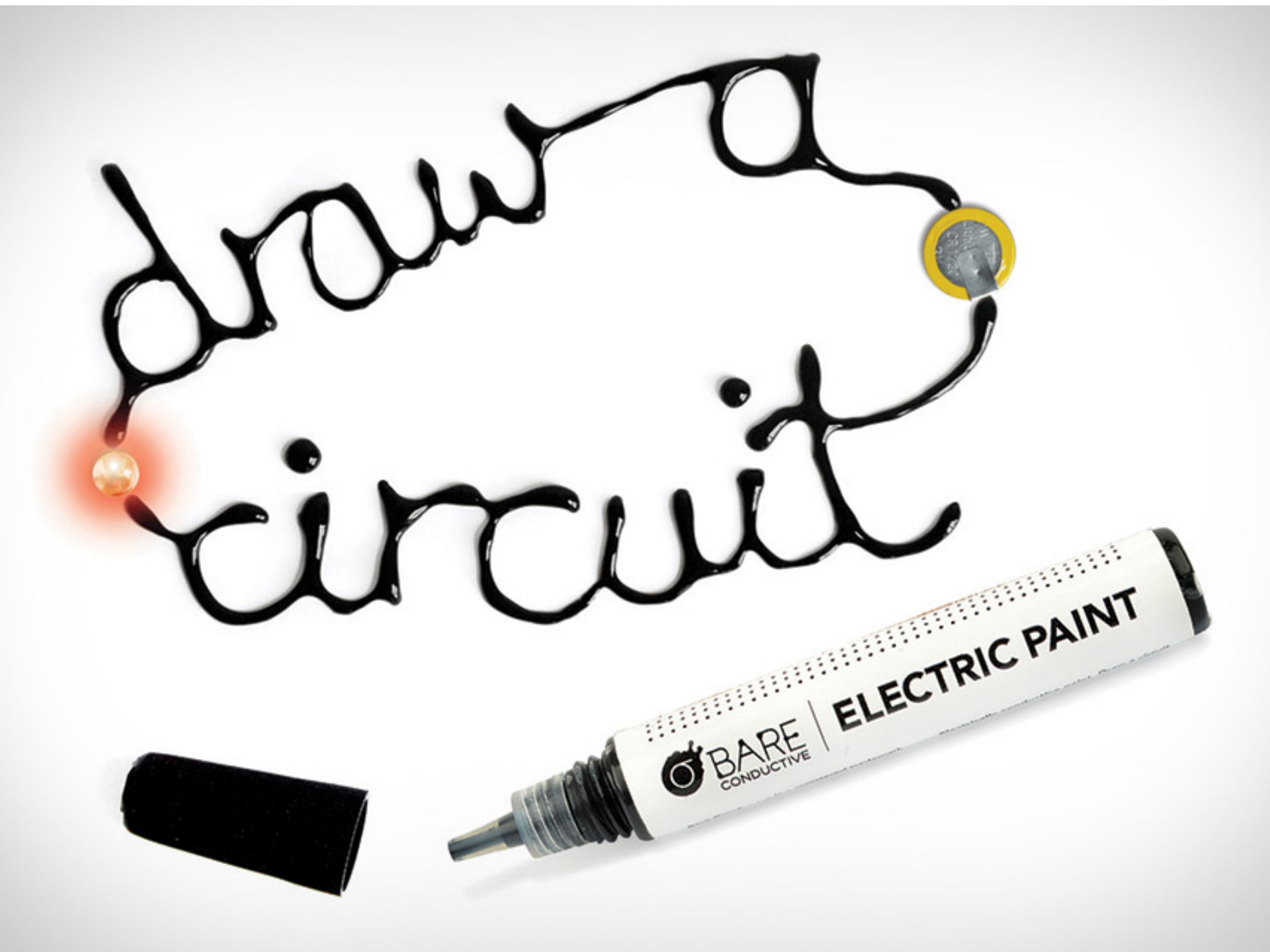
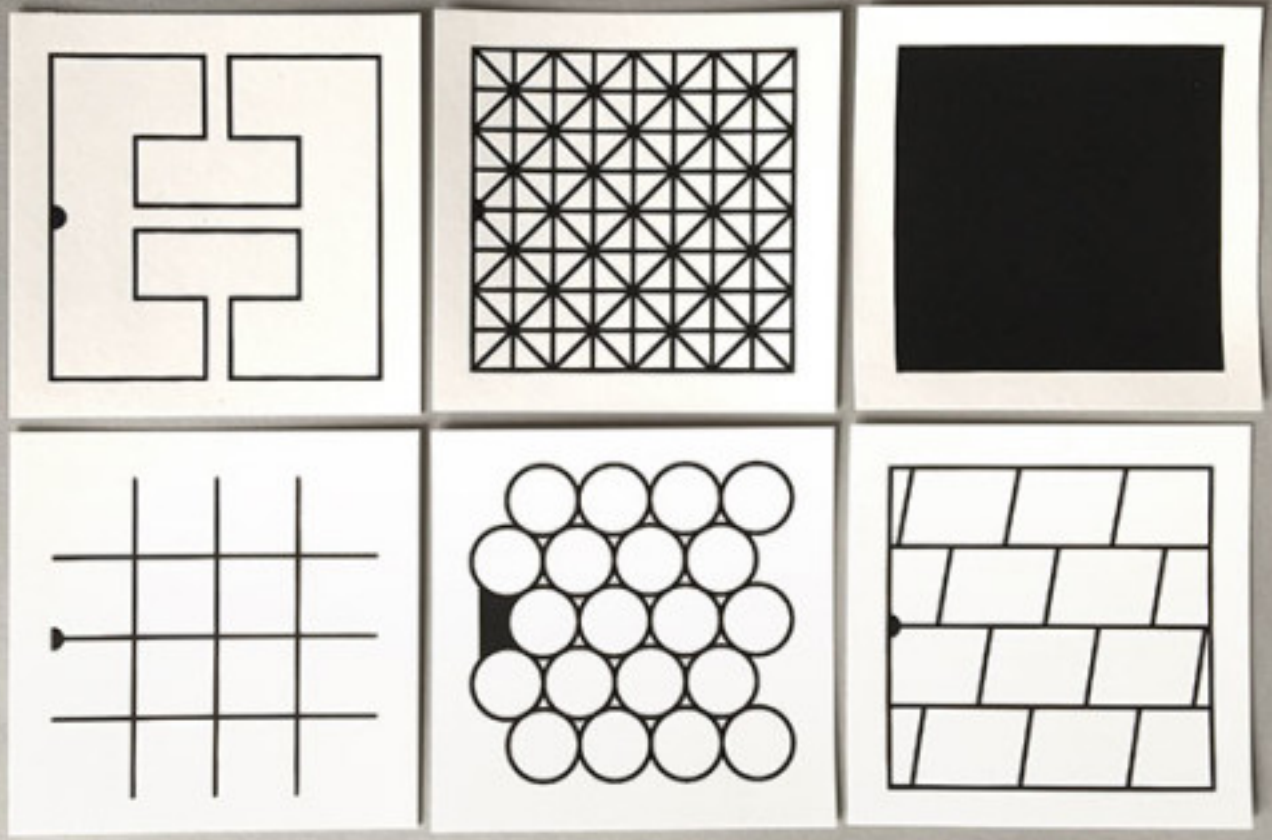
TOUCH ELECTRODES
ICSP
POWER
ANALOG IN
RESET




draw a circuit
BARE CONDUCTIVE
ELECTRIC PAINT




esc
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caps lock
D
shift
Z
X
fn
control
option
command

1. Disconnect the power to the Touch Board, pop out the micro SD card and plug into a computer (you might need a micro SD card reader for this).

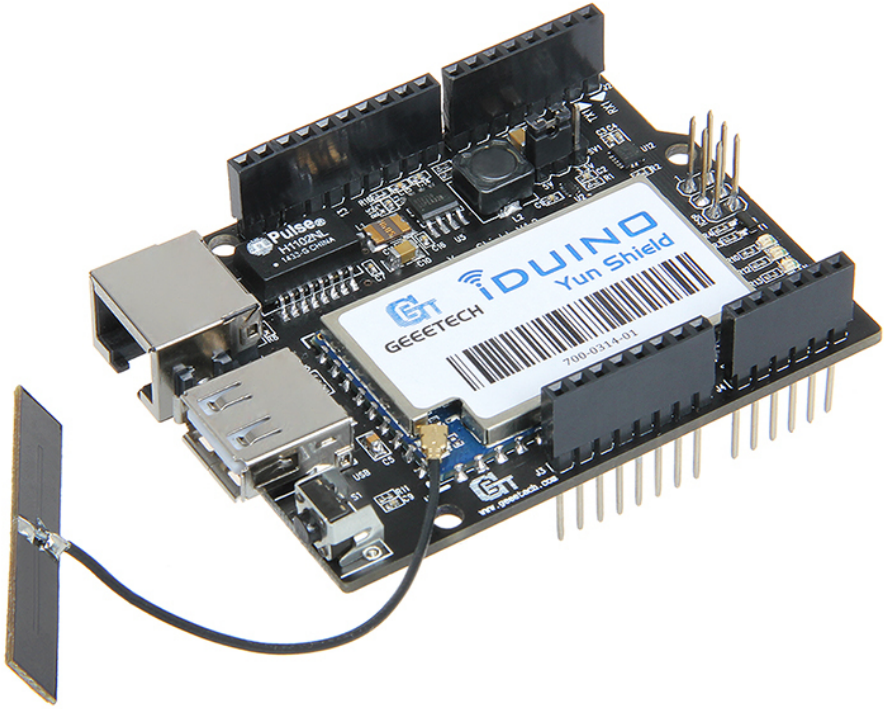
2. Sound_Library or Freesound.org - great resource for sounds and music

3. Choose 12 new audio tracks in mp3 format and move them onto the micro SD card.

4. Rename them TRACK000.mp3, TRACK001.mp3, TRACK002.mp3 etc... up to TRACK011.mp3.

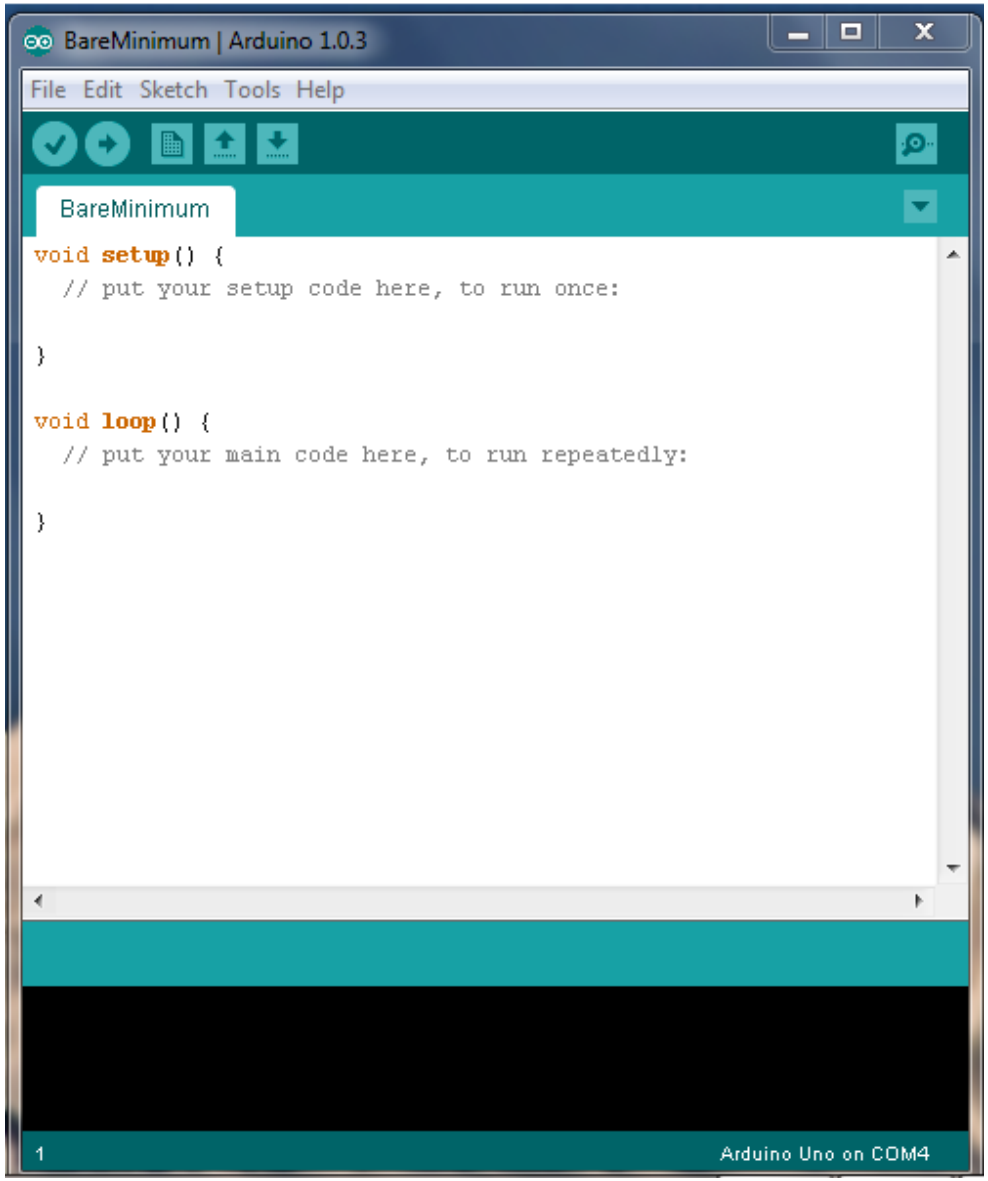
- Touch board based on Arduino
- Uses Arduino Leonardo pin layout
- Can solder pin headers onto the board

Plug in Arduino Shields



e.g. Wifi shield.

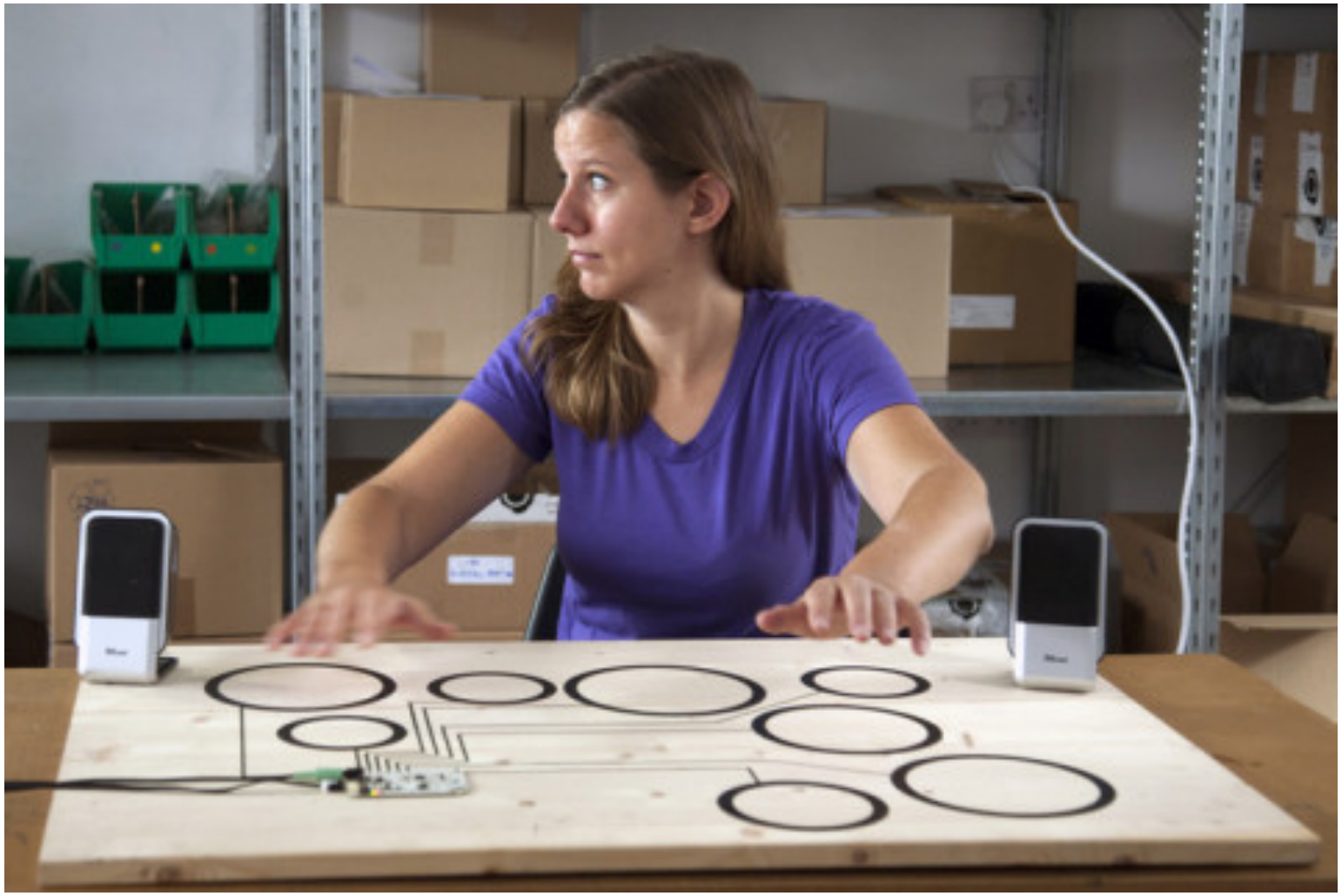
Use standard Arduino IDE



Using the Arduino IDE

- To use the Arduino IDE for the Touch Board you first have to **download** the **Touch Board Arduino Plugin Installer**
- Instalation Guide: -
- https://www.bareconductive.com/make/setting-up-arduino-with-your-touch-board/

Creating a distance sensor



Distance Sensor Code

- Plug the Touch Board into the computer via the USB cable
- Make sure that the power switch on
- Open the Arduino IDE
- Tools→Board
- Tools→Port

- File→Sketchbook→Touch Board Examples→Touch_MP3

Edit these lines

Change from:

```
MPR121.setTouchThreshold(40);
MPR121.setReleaseThreshold(20);
```

To:

```
MPR121.setTouchThreshold(8);
MPR121.setReleaseThreshold(4);
```

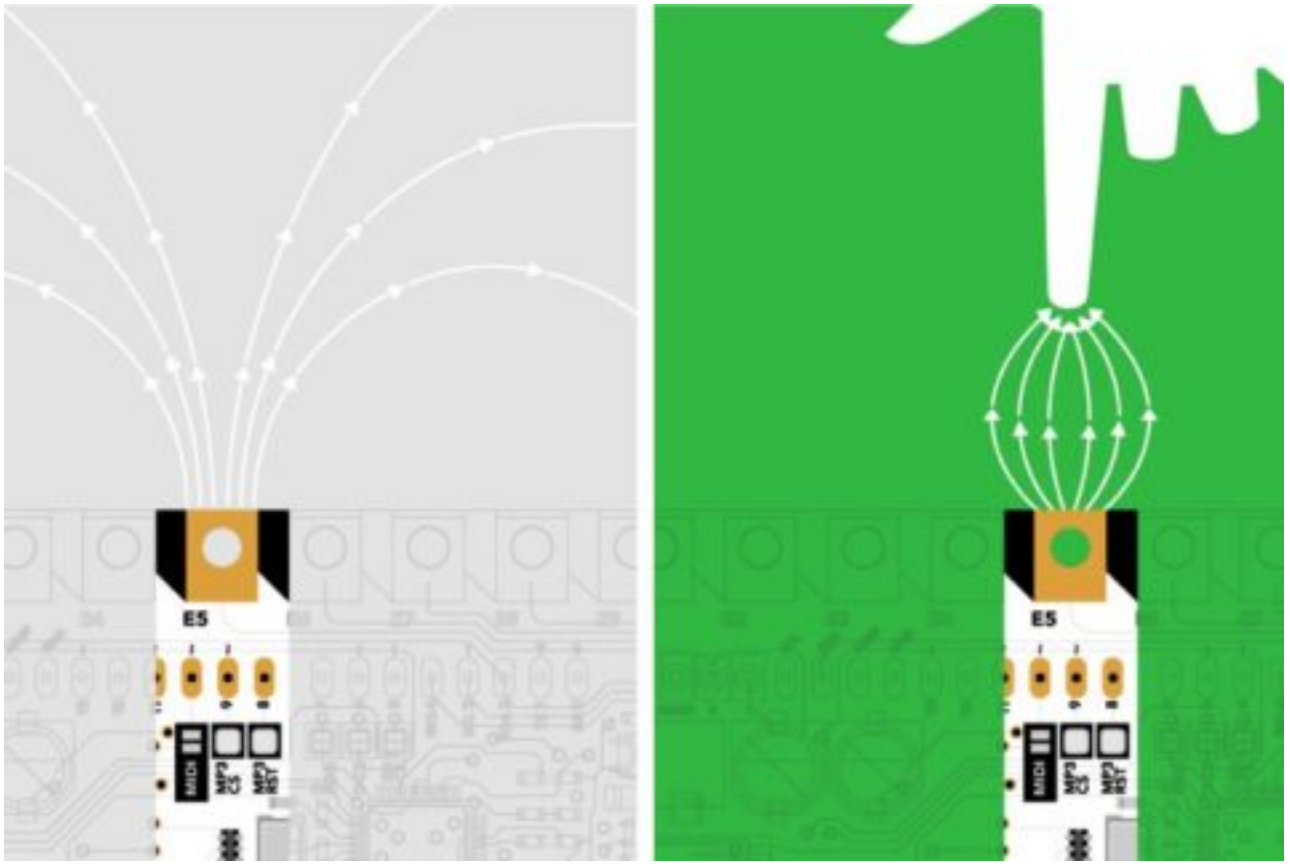
- File→Upload
- Test the programme

Capacitive Sensing:

Capacitive touch sensing is a way of human touch sensing, that requires little or no force to activate. It may be used to sense human touch through more than a quarter of an inch of plastic, wood, ceramic or other insulating material (not any kind of metal though), enabling the sensor to be completely visually concealed.

Why Capacitive touch?

- Each touch sensor requires only one wire connected to it.
- Can be concealed under any nonmetallic mmaterial.
- Can be easily used in place of a button.
- Can detect a hand from a few inches away, if required.
- Very inexpensive.

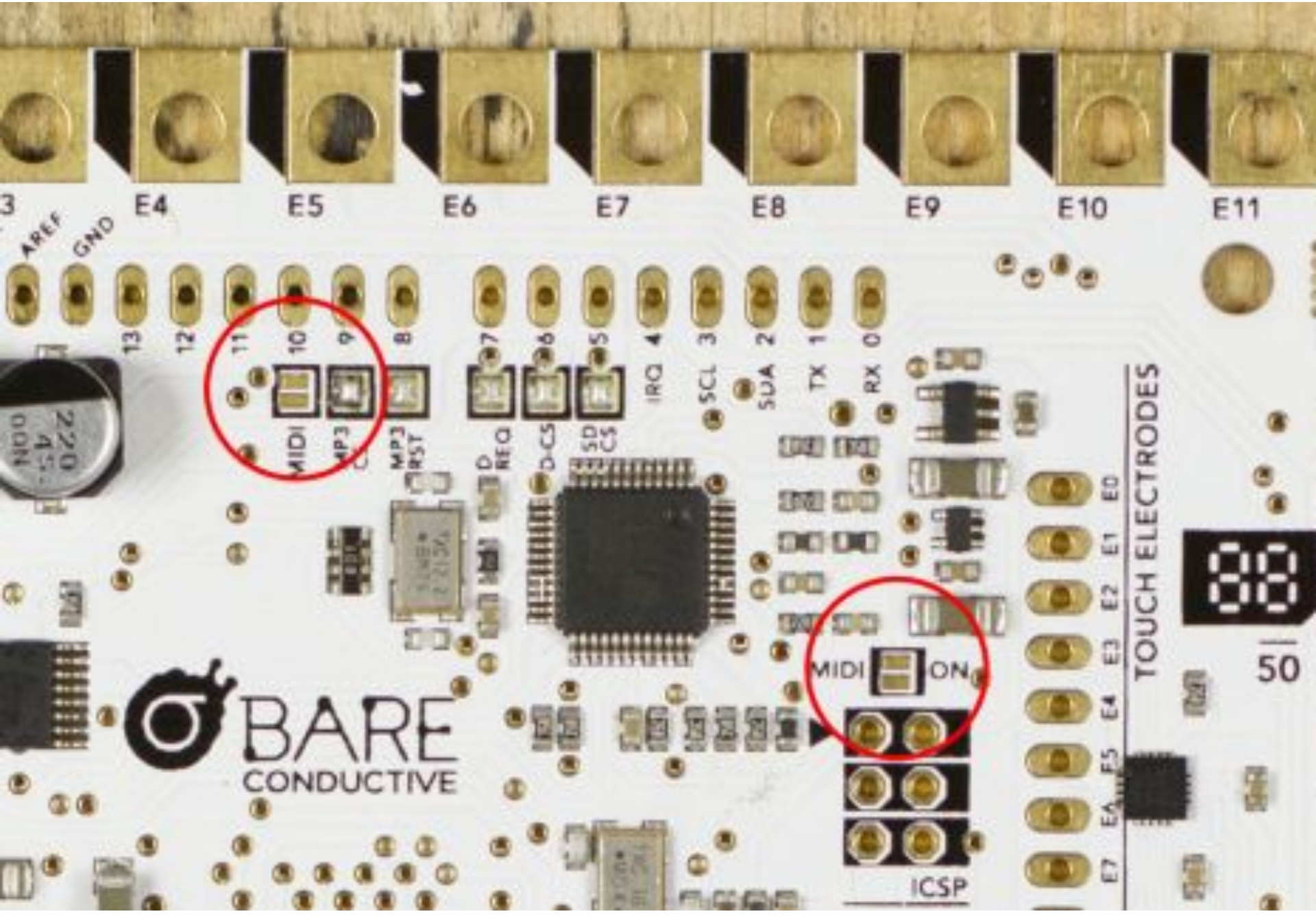


Capacitive sensors work by generating an electric field, and detecting nearby objects by sensing whether this field has been disrupted. Capacitive sensors can detect anything that is conductive or that has a significantly different permittivity than air, like a human body or hand.

Sampler v Midi

- Sampler – plays mp3 files
- This is the standard Touch board set up
- This mode is monophonic

- Midi – Musical Instrument Digital Interface
- Way of connecting different digital musical instruments
- Can play the boards inbuilt synthesizer
- This mode is polyphonic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SDA 2
TX 1
RX 0
MIDI
MP3
MP3 RST
D-REQ
D-CS
SD CS
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TOUCH ELECTRODES
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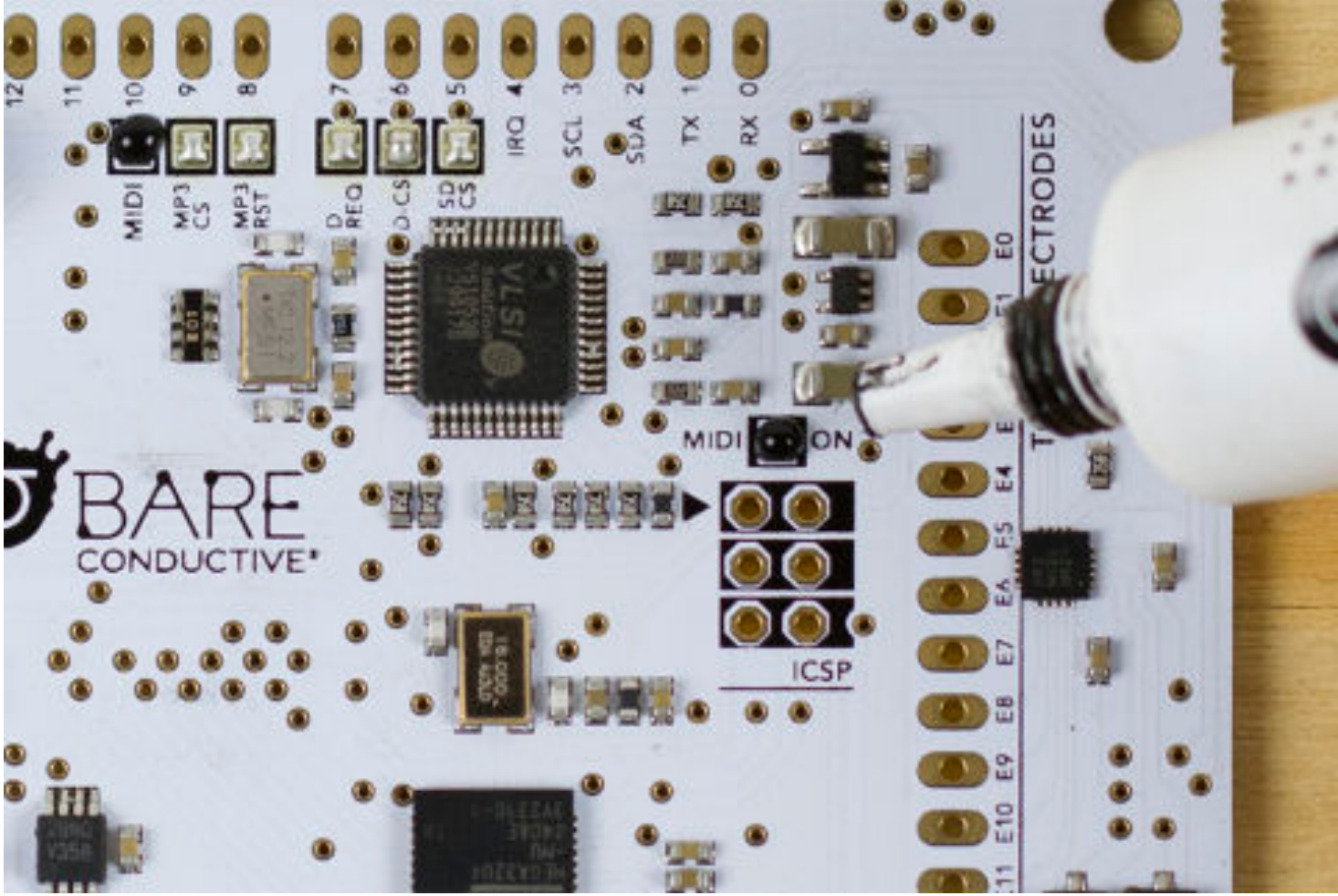
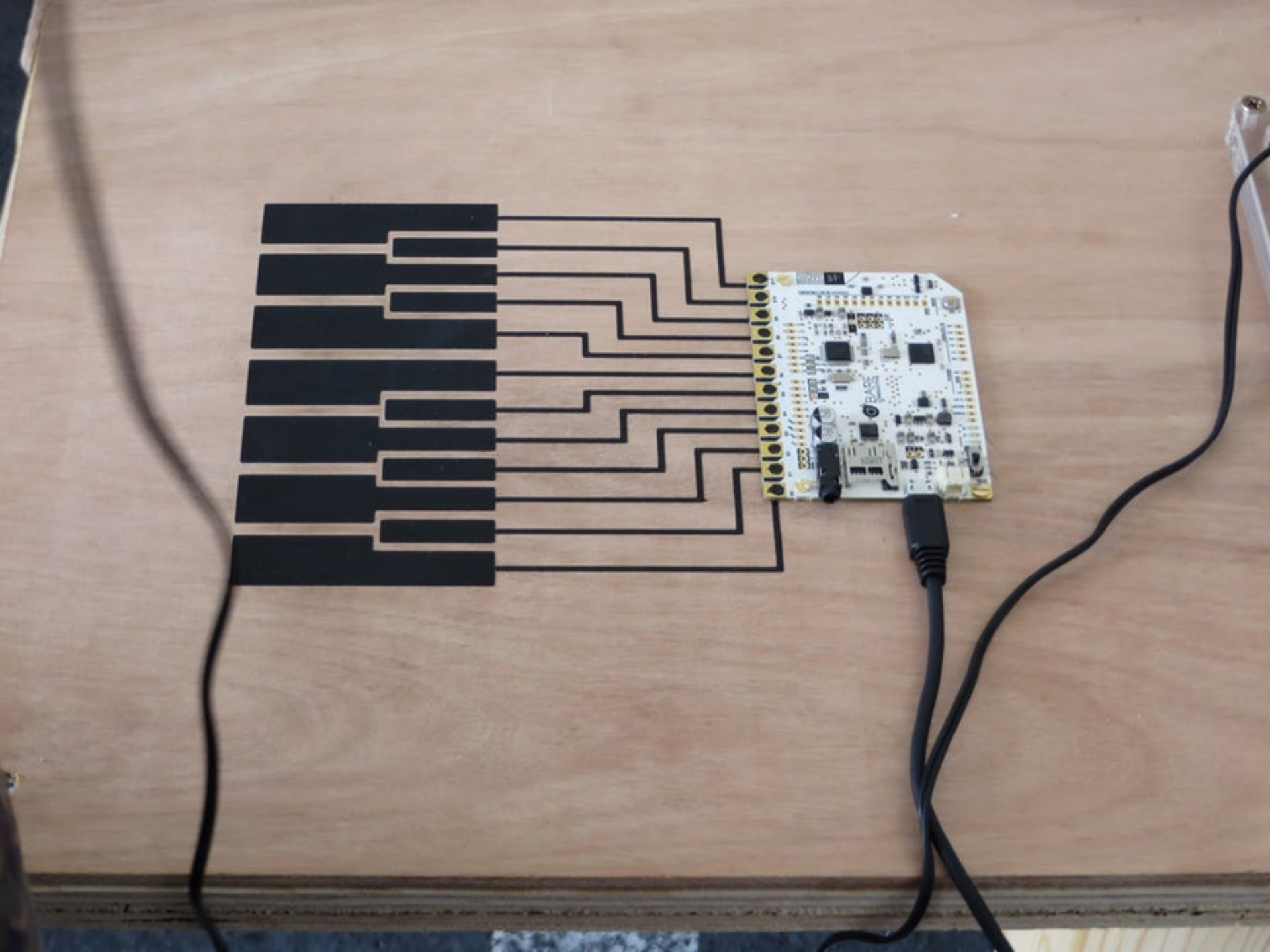
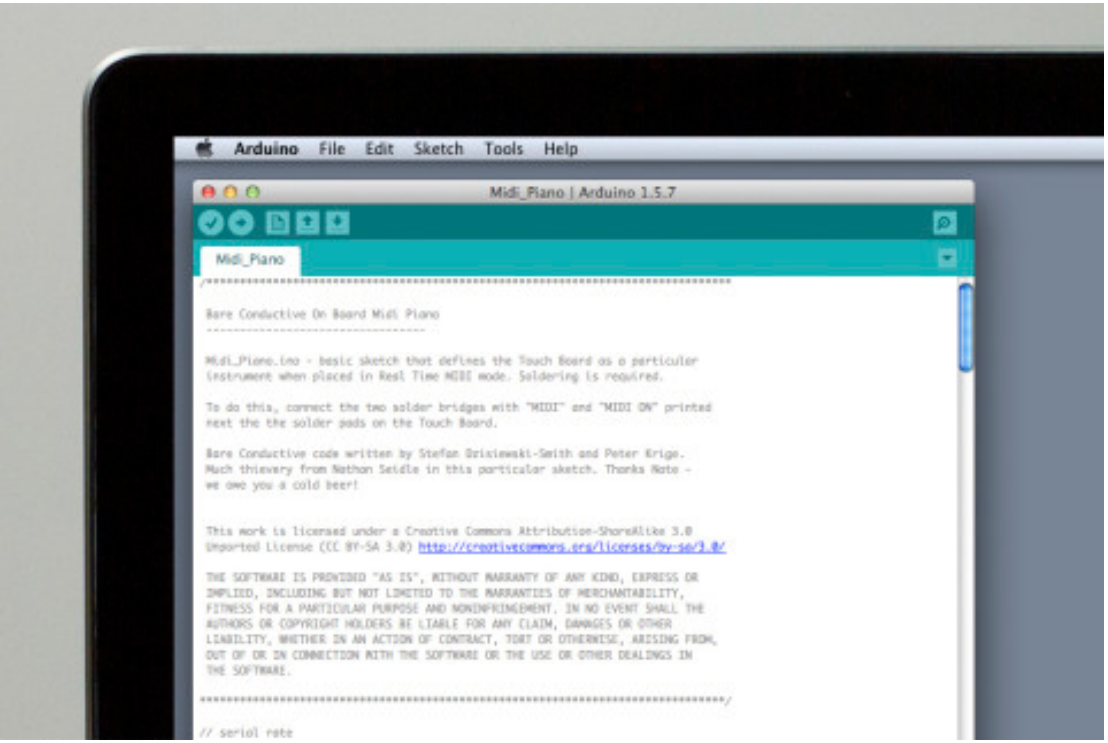
BARE
CONDUCTIVE



- Can use Solder – but this is permanent
- Recommend using Conductive paint



Step one – upload the code

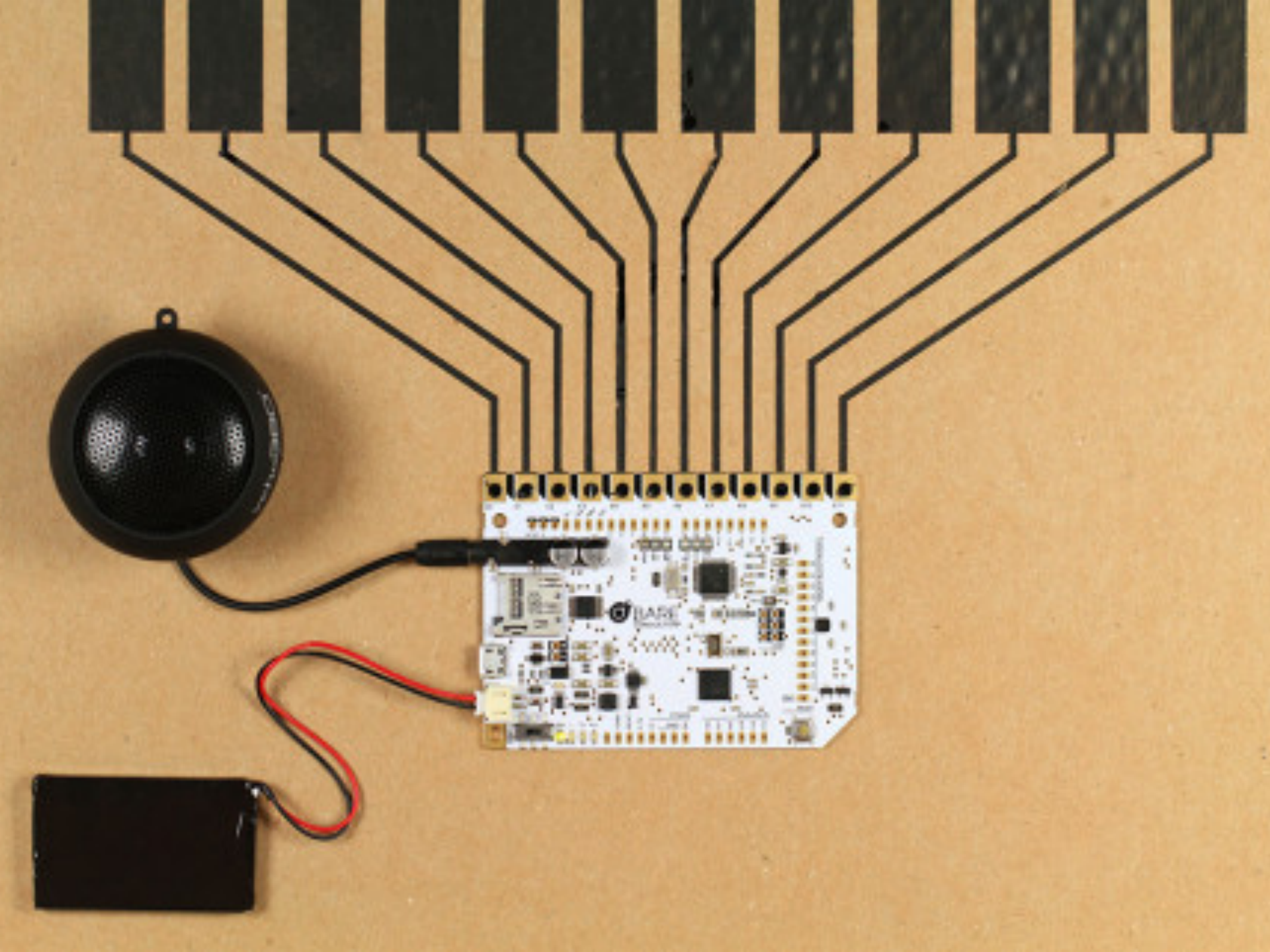


- Plug the Touch Board into the computer via the USB cable
- Make sure that the power switch on
- Open the Arduino IDE
- Tools→Board
- Tools→Port

- File→Sketchbook→Touch Board Examples→Midi_Piano

- File→Upload

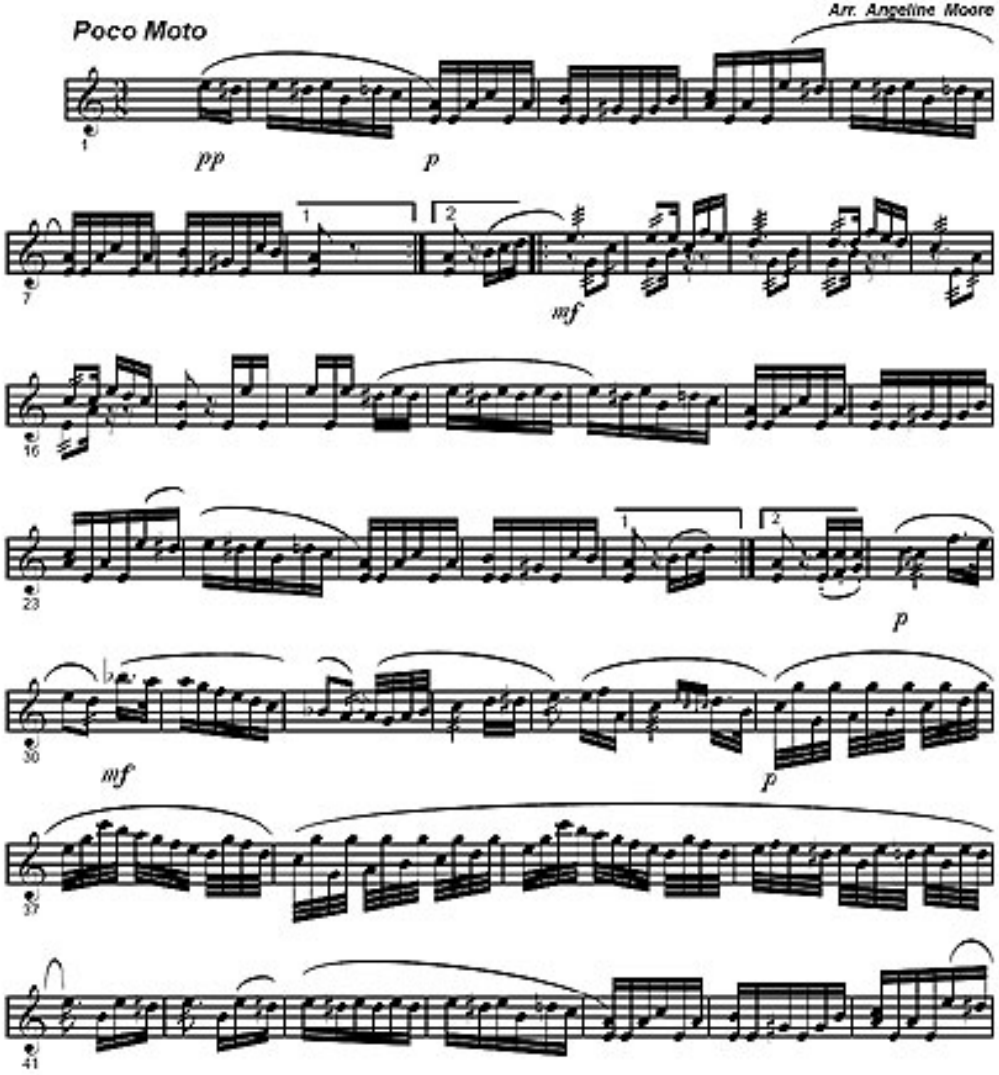
- Test the programme



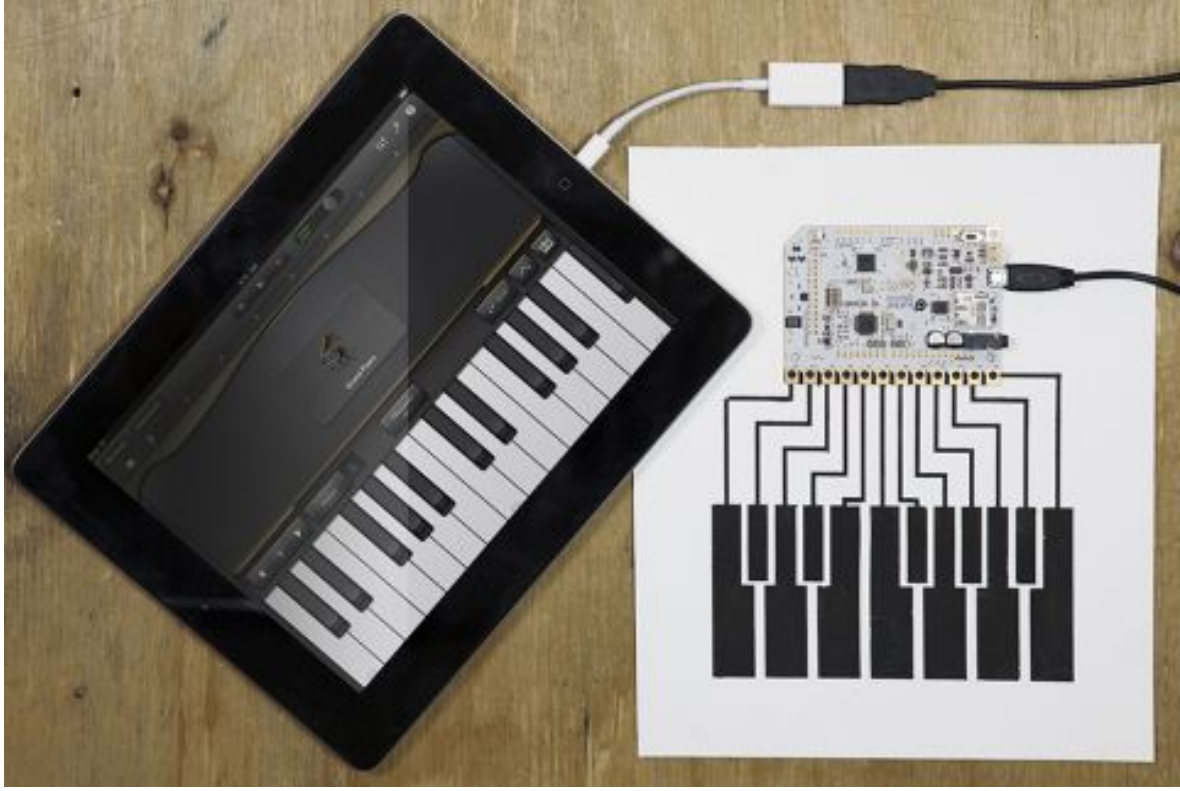
FUR ELISE

SOLO FOR LEAD PAN

Ludwig van Beethoven
Arr. Angeline Moore



Advanced



- The Touch board can be used as a midi controller for midi devices.
- e.g. Garage band or Ableton Live, MAX msp