

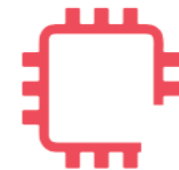
# SCIENT ISSST



MOBILE DEVICES & IoT  
IN BIOMEDICAL ENGINEERING



NOTEBOOKS



SENSE



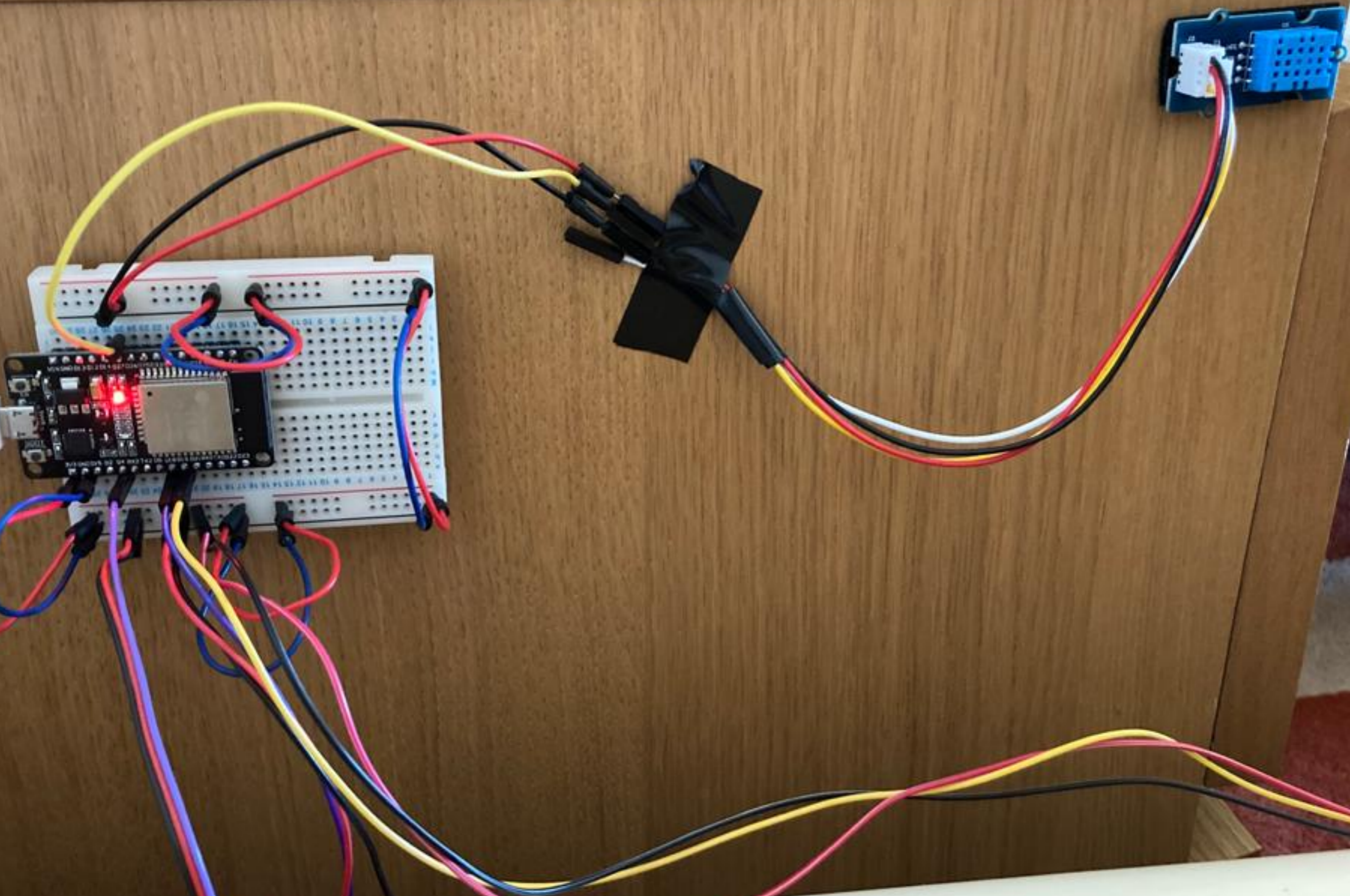
SENSORS



Ana Fred | [afred@lx.it.pt](mailto:afred@lx.it.pt)  
**Hugo Plácido da Silva** | [hsilva@lx.it.pt](mailto:hsilva@lx.it.pt)

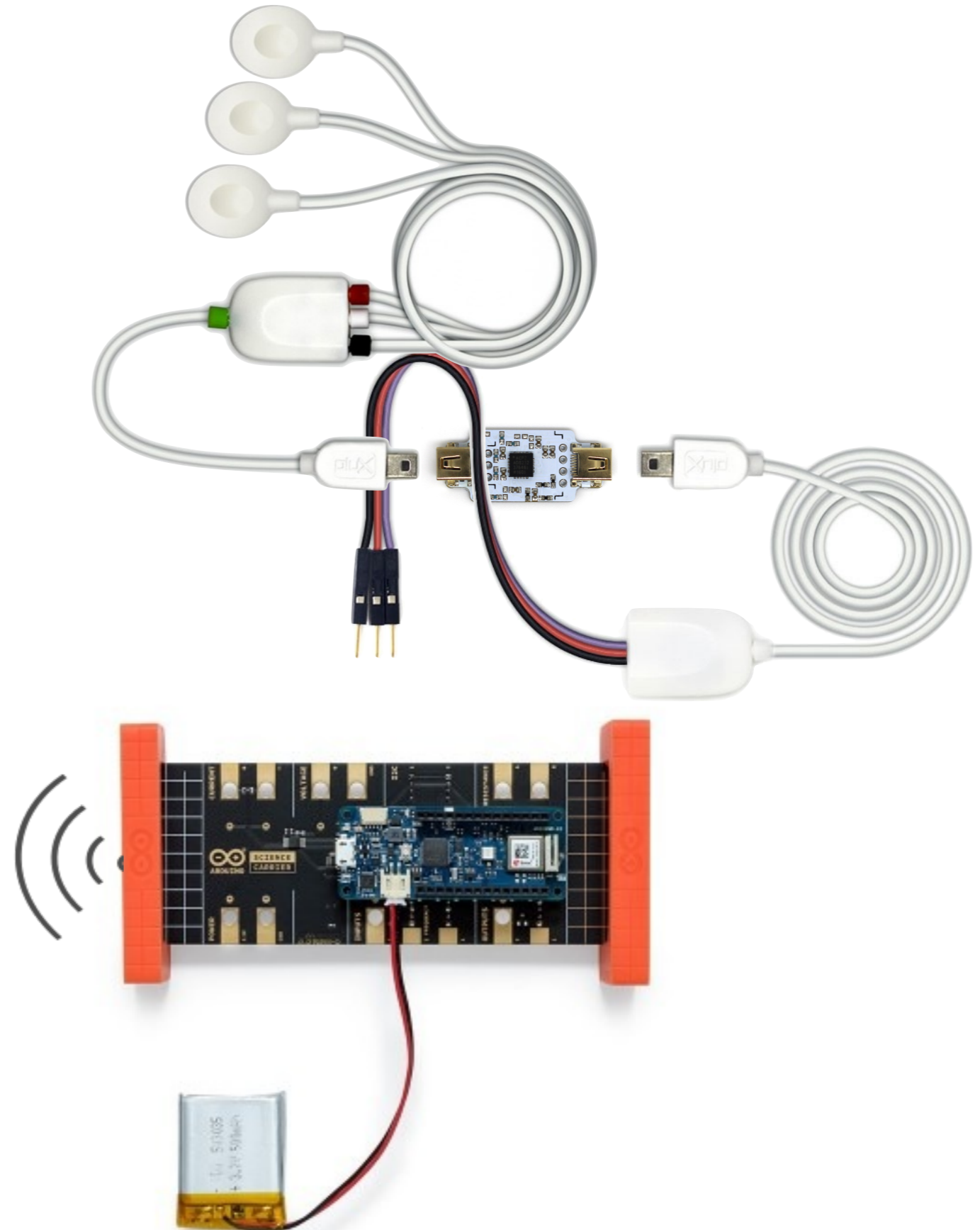
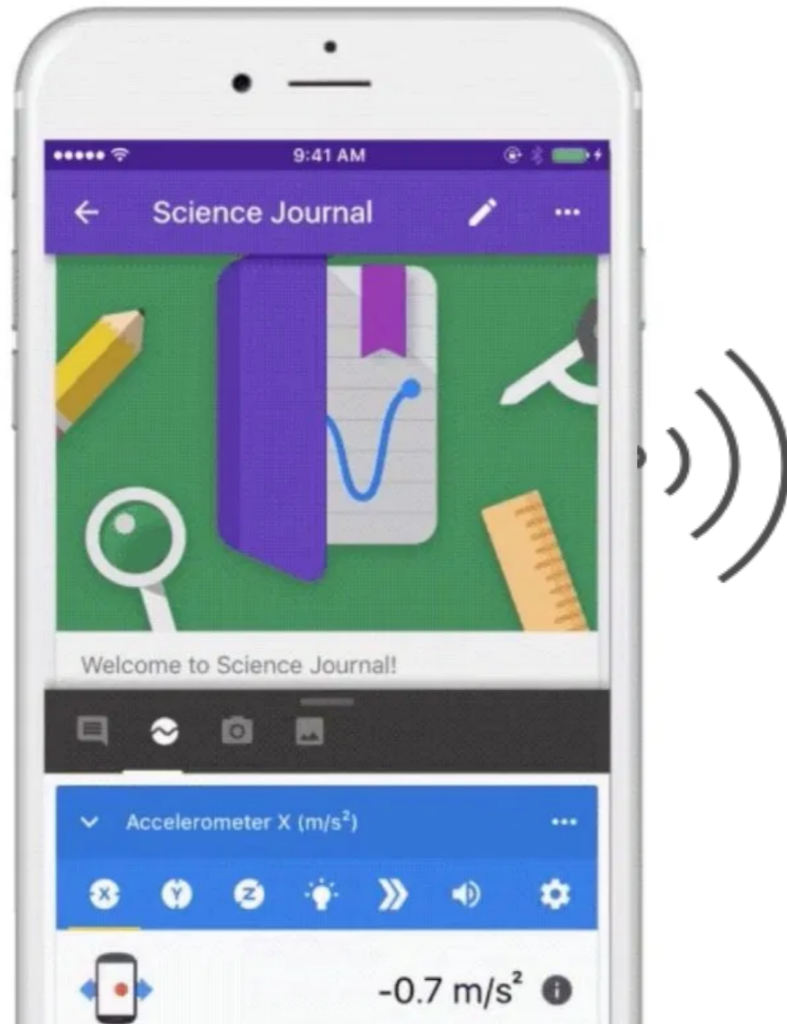
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# Motivation



# Genesis

PIP 2019/2020



# Interactive Learning Content

PIP 2020/2021

The image displays three overlapping screenshots of Jupyter notebooks, illustrating a workflow in signal processing and machine learning.

- Top-left notebook (Python-lab-guides.ipynb):** Shows the section "3. Post-Processing a Signal". It includes a table of contents on the left and a code cell with the following Python code:

```
from pylab import *
from numpy import *
from scipy import signal

def lowpass(s, f, order=2, fs=1000.0):
    b, a = signal.butter(order, f / (fs/2))
    return signal.lfilter(b, a, s)

data = loadtxt("BITalino Hands-on/Sampl...")
emg_data = data[:,5]
abs_data = abs(emg_data - mean(emg_data))
proc_data = lowpass(abs_data, 10) # fil...

plot(emg_data)
plot(proc_data)
```

A plot below the code shows a signal with a mean line and a filtered signal.
- Middle notebook (Physioma2019.ipynb):** Shows the section "Feature Extraction". It includes a diagram titled "MORPHOLOGICAL SPACE" showing a signal waveform with "Window 1" and "Window n" marked. An arrow labeled "FEATURE EXTRACTION" points to a "FEATURE VECTOR" box containing "Window 1 features". Below the diagram is a code cell:

```
[ ] cd BioSPPy
[ ] /content/BioSPPy
[ ] import biosppy as bs
[ ] cd biosppy/features
[ ] /content/BioSPPy/biosppy/features
[ ] data.shape
[ ] (2334000, )
[ ] # Feature Extraction
```
- Bottom-right notebook (AutoEncoderResp.ipynb):** Shows the section "3. Autoencoder creation and training". It includes a diagram of an autoencoder with "Input", "Autoencoder", and "Output" stages. Below the diagram is a code cell:

```
[ ] cd biosppy/classification
[ ] /content/BioSPPy/biosppy/classification
[ ] import utils_classification as uc

label = 'AE1'
loss = 'cosine_proximity'
activ = 'tanh'
opt = 'adam'
nodes=[500,250,50]
```



# Highlights

**400+**

students (all cycles)

**20+**

BSc, MSc & PhD

**3**

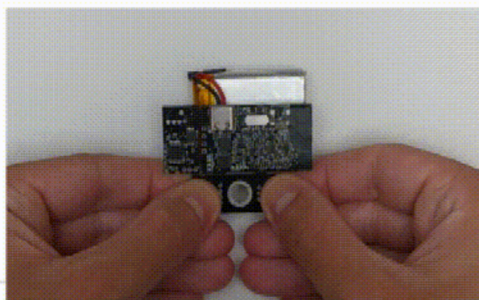
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**3**

external HEIs

## ECG Demo

### EDGE VIEW



DISCONNECT

STOP

5 s

#### CLASS



#### AI1





**BE**  
BIOMEDICAL ENGINEERING FOR EVERYONE

PULL & BEAR  
— 1991 —  
GENUINE - QUALITY



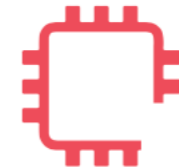
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