Proof of Concept:
Designing of a connected Baby Phone

Tiphaine Collot - Sybil Appas - Léonard Castanie - Anatole Dupré

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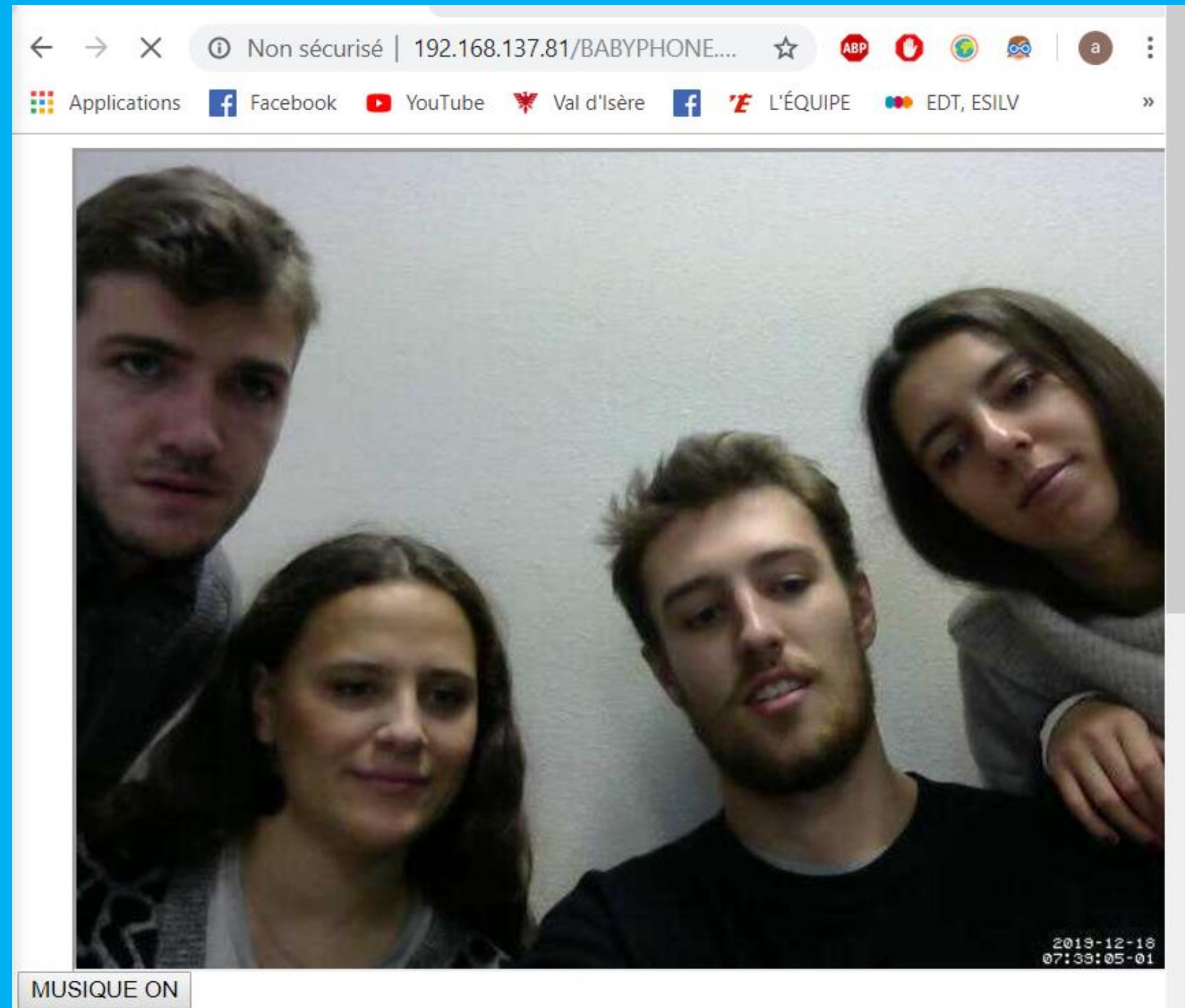# MATERIAL NEEDED

RASPBERRY PI

WEBCAM WITH MICROPHONE

LOUDSPEAKER

SERVOMOTOR

DEMO

Microphone

Technical aspects

- Python

- Library pyaudio: allow us to create a connection with the microphone of the webcam

- Library audioop: this module contains some useful operations on sound fragments.

- Conversion in dB

```
data = stream.read(2048)
rms = audioop.rms(data,2)
print(rms)
decibel = 20* math.log10(rms)
```

Challenges encountered

- Problem with the contiuous recording capacity

```
File "audioTest.py", line 25, in <module>
    ecoute()
File "audioTest.py", line 15, in ecoute
    data = stream.read(CHUNK)
File "/usr/lib/python3/dist-packages/pyaudio.py", line 608, in read
    return pa.read_stream(self._stream, num_frames, exception_on_overflow)
OSError: [Errno -9981] Input overflowed
```

Camera

Technical aspects

- Software motion : it's used for security camera which detect any movement

```
pi@raspberrypi:~ $ sudo service motion start
pi@raspberrypi:~ $ sudo service motion stop
```

Challenges encountered

- Inability for the webcam to be used for the camera and the microphone in the same time

- Problem with the permission (sudo) to start and stop the webcam in a python code
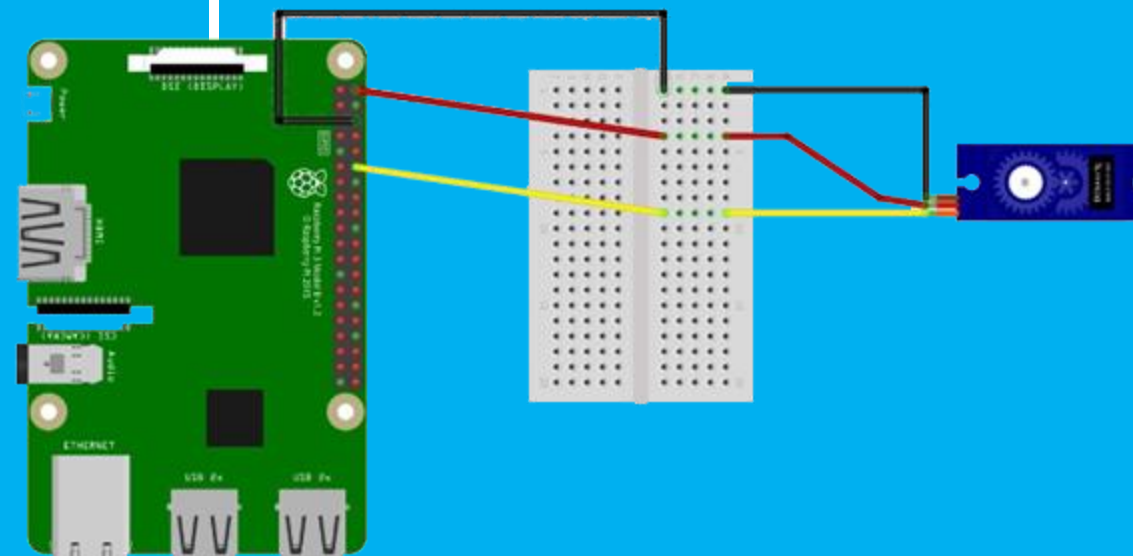
Servomotor

Technical aspects

Challenges encountered

- Python

- Library RPI.GPIO that contains all the functionalities we need to manipulate a GPIO pin.

- The method PWM (PWM = Pulse Width Modulation) allows to give very fast impulses to the motor.

- Servo motor that doesn't work

- Understand GPIO functionalities in an other language than C

Mail Alert

Technical aspects

- Python

- Library smtplib : Simple Mail Transfer Protocol (SMTP) server is used to send emails.

- Two steps validation of Gmail to generate a special password.

Challenges encountered

- The authorizations of our google account.

Music

Technical aspects

Challenges encountered

- Python

- Library pygame and time

- How to acces to our file .mp3 on a USB key

-

```
pygame.mixer.init()
pygame.mixer.music.load("/media/pi/6CBE-C604/breh.mp3")
pygame.mixer.music.play()
while pygame.mixer.music.get_busy() == True:
```

Web Page

Technical aspects

Challenges encountered

- Php/Html language

- We used the function exec() to execute a python code

- Iframe and use of a button to run a python code

- Difficulty to execute a python code in php code due to the different permission

```
<iframe src="http://192.168.137.81:8081" right="500px" width="640px" height="480px" align="right" >

</iframe>
```
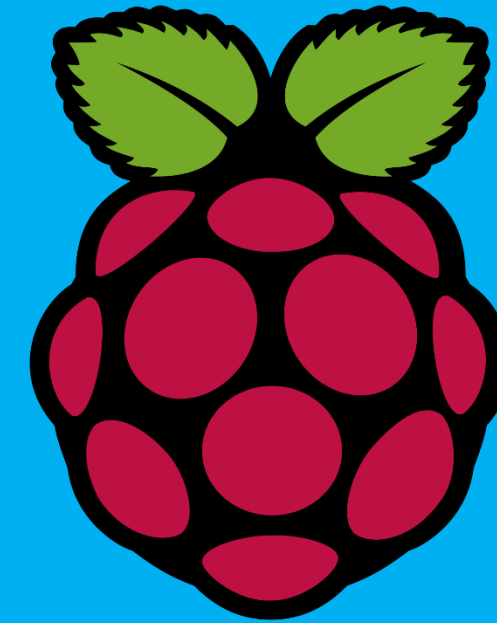
Assembling functions

ARCHITECTURE

DIFFICULTIES

SOLUTIONS

OPTIMIZATION

Conclusion