

# Physiological Data Analytics display

# **CONTENTS**

<b>1 Possible Measurements means .....</b>	<b>3</b>
1.1 PPG .....	3
1.1.1 Heart Rate & SPO2 .....	3
1.1.2 Glicemic Index .....	3
<b>2 Hardware Components .....</b>	<b>4</b>
2.1 Power Supply .....	4
2.2 Microcontroller .....	4
2.3 PPG chip sensor .....	4
2.4 Data Transmission Module .....	4
2.5 Display .....	4
2.6 Case .....	5
<b>3 Data Workflow .....</b>	<b>6</b>
3.1 Acquisition .....	6
3.2 Forward Transfer .....	6
3.3 Elaboration .....	6
3.4 Backward Transfer .....	6
3.5 Visualization .....	6
<b>4 Programming Languages .....</b>	<b>7</b>
4.1 Microcontroller .....	7
4.2 Data Elaboration .....	7
<b>5 Functioning .....</b>	<b>8</b>
<b>6 Problems .....</b>	<b>9</b>

# **1 POSSIBLE MEASUREMENTS MEANS**

## **1.1 PPG**

Like MAX30102

### **1.1.1 Heart Rate & SPO2**

TODO

### **1.1.2 Glicemic Index**

Red Blood Cells absorbance depends on the glicemic index. Coupling it with ML model to estimate the glicemic index can be acceptably precise.

Study link:

## **2 HARDWARE COMPONENTS**

### **2.1 Power Supply**

Options:

1. Little power bank can be just plugged-in to an esp32 via usb.

### **2.2 Microcontroller**

Options:

1. Thinking about an esp32 risc-V because of little size.

### **2.3 PPG chip sensor**

Options:

1. MAX family chip sensor

### **2.4 Data Transmission Module**

Options:

1. Built-in esp32 module

### **2.5 Display**

Options:

1. Web Interface ran by the **SERVER**
2. Wearable mini-display

## 2.6 Case

To hold all Components

## **3\_ DATA WORKFLOW**

### **3.1 Acquisition**

From **SENSORS** to **MICRO**

### **3.2 Forward Transfer**

From **MICRO** to **SERVER**

### **3.3 Elaboration**

From **raw data** to actual **physiological parameter**

### **3.4 Backward Transfer**

From **SERVER** to **MICRO**

### **3.5 Visualization**

From **MICRO** to **DISPLAY**

## **4 PROGRAMMING LANGUAGES**

### **4.1 Microcontroller**

Based on my language knowledge:

**RUST** or **MICROPYTHON**

I will consider micropython if possible.

### **4.2 Data Elaboration**

**RUST** or **JULIA** or **PYTHON**

I think im gonna choose julia.

## 5\_ FUNCTIONING

**MICRO** will get datas coming from **SENSORS** and will send to **SERVER** through **WIFI** or other protocol.



## **6 PROBLEMS**

1. How to package all the components in an acceptable format size?
2. How to install the ppg sensor in order to not get too noisy signal and to make it comfortable to wear?