

# PPDV first milestone

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## Overview

The goal of this project is to create an interactive visualisation of data provided by API <http://tesla.iem.pw.edu.pl:9080/v2/monitor/2>. This API provides measurements of a device for monitoring walking habits and patterns of elderly and disabled persons. First milestone aims of designing user interface. Here is our static design we developed using plotly dash:



## Explanation of prototype

We decided to divide our application in 4 parts:

- Person selector (left section of website)
- Sensors measurements (upper middle section of website)
- Foot visualisation of sensors measurements (upper right section of website)
- Advanced sensors measurements (bottom right section of website)

### Person selector

The data we work on are strictly related to the people who “produce” them. With this in mind, we decided not to add the usual dropdown selector, but to add a larger component thanks to which the researcher will have the related person in mind all the time. In our selector the chosen patient is indicated with yellow colour.

## Sensors measurements

Sensor measurements panel provides most important information in consideration of each particular foot pressure value. There are 4 columns. First one is the sensor's name. The second one contains a small graph with a pressure-time trace. Third, show the current pressure value in the form of a bar. The last one indicates whether the measurement is considered an anomaly or not. For the user this might be the first place to look at data as it shows data of all sensors at the same time.

## Foot visualisation of sensors measurements

As suggested in functional requirements we added a foot visualisation by creating a custom dash component. For this we used the react and d3 libraries as they are suggested solutions by plotly dash developers. With this visualisation researchers can easily see what pressure is applied on what part of the foot in real time .

## Advanced sensors measurements

As this pane takes up the most of the layout space, this is considered to be the main component for analysing data. Here, traces of all sensors will be shown on one graph. On the top of the graph, there is a dropdown list with multiple selections. Users can choose which sensors should be shown on the graph. In the top left corner, there is an anomaly switch. When it is set on, the graph will contain only data which anomaly value is true.

## Edward Tufte's graphical integrity principles

No.	Rule	Importance	Percent satisfied	Explanation
1.	The representation of numbers, as physically measured on the surface of the graph itself, should be directly proportional to the numerical quantities represented.	high	100%	All sensors measurements are represented on the graph with points, whose values are corresponding to proportional ticks on both axes.
2.	Clear, detailed and thorough labelling should be used to defeat graphical distortion and ambiguity. Write out explanations of the data on the graph itself. Label important events in the data.	high	90%	Graph's axes are labelled. There is also a graph's legend, describing particular traces. On the left panel, the current chosen patient is indicated with yellow colour.
3.	Show data variation, not design variation	medium	100%	The whole design of the dashboard is not over complicated. There have

				been used clear grid layout with a limited colour palette. Icons and graphics are simple and not disruptive.
4.	In time-series displays of money, deflated and standardised units of monetary measurement are nearly always better than nominal units.	low	30%	In case of this project, measurements are numerical values from range 0-1023. Therefore, there is no need to put information about any units. However, timestamps will be shown in full date format.
5.	The number of information carrying (variable) dimensions depicted should not exceed the number of dimensions in the data. Graphics must not quote data out of context	medium	100%	Considered data relate to foot pressure measured in time. In this case, It will be adequate to use two dimension graphs to represent the values.
6.	Graphics must not quote data out of context	high	80%	All elements of dashboard layout are related to measured data. There are not any redundant graphics. Left side panel can be considered as too big, but it has been done for the sake of user's convenience when switching the current patient.

## Conclusion

To sum up, we decided to keep the design simple and concise. We limited the colours of the entire application to three main colours: blue, yellow and grey. These colours are characterized by good contrast and being complementary to each other. All of the layout elements are related to data and there is no redundant graphics. The most important components for the user covers the biggest area of the interface.