Athlete Web Application

using Polar H10© and Polar Verity Sense©

Project Goals

- Create a React Web-application to display real time sensor data
  - Extract data from Polar device (H10 and Polar Verity-Sense)
    - This is done by using the Web Bluetooth API
  - Depending on connected device: ECG/PPG, Accelerometer Data, BPM should be displayed in an understandable way
    - webpage will change dynamically
  - Calculate the speed a sensor is being moved
  - Test the limitations of the browser can handle real time data

State-of-the-art

- Currently Polar is using the Polar Flow
  - as mobile application that can display some real time data
  - as web application to display collected data (but not in real time)

- Our projects focus is to implement real time data display on the browser and test its limits
  - This type of real time data web application is something that Polar doesn’t currently have.

Project data and why we need it

- PPG
  - This data measures the blood volume changes in the microvascular bed of tissue. So in layman's terms that means this PPG is used to measure what is the blood volume and oxygen uptake rate.
  - PPG data can be very important for professional athletes and medical personnel.
- Battery level
  - To show charging information
- ECG
  - This data tracks the electrical activity of users heart. It is a key element in the detection of various cardiac complications.
- BPM
  - This data is useful for the user to see their heart rate while working out or to track it in everyday tasks.
- Accelerometer/Gyroscope
  - To show the speed of either limb or torso of the end-user.

Front-end demo

Struggles and success

Struggles

Converting the html to React

We don’t have enough data to progress more

Make the design a bit more appealing

Implement a dynamic layout for the page

Have to improve the connection with back-end code

Success

Creating usable ECG and PPG charts that can display data

Displaying sensors battery level and BPM when device is connected

Back-end demo

Struggles and success

Struggles

There were and still are big issues with extracting the different data-types from the polar devices.

Understanding the necessary PMD Control Point Commands

Understanding the format of the data stream from the devices.

➔ Because of that we are behind schedule

Success

Big success on starting the data stream and getting some data from the devices for acceleration and PP-interval data.

We are able to extract and show device information, heart-rate and battery level from the devices.

Trello and Timeline

- https://docs.google.com/spreadsheets/d/11SqpF1FvS1LEMWFz0SsEXg5F3Ot5597p3i7_x48yxm0/edit#gid=0
- https://trello.com/b/6x4HYCa9/project

Future possibilities

- Add a database
  - create User Profiles
- Add an alert if BPM threshold is exceeded
- Implement a mode where both sensors can be connected?
- Move web-page to an accessible cloud-server
- To have an 3D modeling of the end-users limbs motiong, to be used to monitor users movement techniques.

what this needs to tell

Research Phase presentation that includes; clear definition of goal, state-of-the-art, methodology, SW desing, creative ideas on top of basic requirements. Also view of timeline, trello board and possible changes/problems. 20mins PowerPoint slides in Github

Pagenumbers

Daniel has to be more present!!

Dataextraction stabe!

Goal till next milestone

Description of architecture and technology

Prio on deploying web app in cloudserver

Usercases and Promotion! Ask the users!

UI/UX

Concentrate on making the data extraction and visualization working smoothly

first integral of acc data is speed, second is traveld track