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Total effort: 12 hours

**Functional requirements**

1. Two CC2650 SensorTags are acting as peripherals and sending periodically acceleration and gyroscope data to the PC.

2. A PC application should be able to connect simultaneously to multiple peripherals via BLE.

3. A PC application should be able to receive sensor data (accelerometer & gyroscope) in real time.

4. Data visualisation. Line graphs with accelerometer and gyroscope data received from SensorTag.

5. The graph should depict the average value of received sensor data within the offset time.

6. Posibility to enter User‘s general information.

7. Posibility to calibrate system thus differensiate between sudden movements like walking the steps and free fall .

8. Main UI with basic control functions for operator working with a PC application.

**Non-fumctional requirements**

1. User general Information is a pop up window and it should contain:

- First name

- Last Name

- Date of Birth

- Gender

- Address

- Mobile number of user

- Blood type

- Contact Person1

In case of fall this Person will be contacted.

- Contact Number1

Phone number of a Contact Person.

- Contact Person2

In case of fall and if Contact Person1 is not replying this Person will be contacted.

- Contact Number2

Phone number of a Contact Person2.

- Contact Person3\*

In case of fall and if Contact Person1 and Contact Person2 are not replying this Person will be contacted.

- Contact Number3\*

Phone number of a Contact Person3.

- Save button to save changes

2. Application Settings is a pop up window containing following information:

2.1 Offset with default value of 0.25 seconds.

Graphs of gyroscope and accelerometer will be updated every offset time with average values of gyroscope and accelerometer received during offset time.

2.2 Delta for fall detection (gyroscope and accelerometer).

While falling values of accelerometer will gain acceleration and then will be equal to null.

If delta of accelerometer received from sensor is bigger than configured delta in settings it will mean that the person is probably fell. The duration of free fall is also important because we have to differentiate between sudden movements like walking the steps and free fall, the duration will be different although delta values might be the same.

While falling values of gyroscope will change and after reaching the ground values will be in horizontal position.

2.3 Set Default button

After clicking on it, all the default values will be set and Settings pop up window will remain open.

2.4 Save button

After clicking on save button, all the changes will be saved and Settings pop up window will remain open.

2.5 Cancel button

Cancel changes.

2.6 Close button

Clicking on close button will close Application Settings pop up window.

3. In Main UI:

3.1 Graphs with Accelerometer and Gyroscope data.

3.2 Accelerometer and Gyroscope data in the graphs will be updated at the same offset time.

3.3 Buttons connect/disconnect(to establish the bluetooth connection).

3.4 Buttons start/stop receiving gyroscope and accelerometer data.

3.5 Button Clear graph.

3.6 Label for Sensor Status (Connected to the sensor or No connection).

3.7 Laber for Fall Detection.

If fall is detected inscription about falling will be displayed.

If not inscription «Fall was not detected» will be displayed.

3.8 Label for «help requested».

If fall was detected and user did not pressed the button on SensorTag to report about False alarm inscription on requesting help will be displayed.

3.9 When the Sensor is not connected to the PC Application(e.g. when Data is not being recieved), than Buttons Start, Stop and Clear should be deactivated\*

3.10 Stop button is Activated when Start is pressed.

4. „False alarm“. When device senses a fall it beeps first and if button on SensorTag is not pressed quickly it calls for help