COMP 3004 Final Project

Use Cases

Use Case 1: Creating a Profile

Primary actor: User
Stakeholders and interests:
- User
- Application

Precondition:
- User installed application on their mobile device.

Success guarantee:
- User successfully adds a profile in the application.

Main success scenario:
1. User presses “Add profile” button
2. User inputs information in the first name, last name, weight, height, date of birth, country, phone, email, and password fields
3. User presses “Create User” button

Extensions:
2a. One of the input fields is empty
    2a1. The app shows an alert to notify the user that one of the fields is empty
    2a2. The user fills in the empty field

Use Case 2: Deleting a Profile

Primary actor: User
Stakeholders and interests:
- User
- Application

Precondition:
- User installed application on their mobile device.

Success guarantee:
- User successfully deletes a profile in the application.

Main success scenario:
1. User selects a profile in the profile dropbox menu
2. User presses “Delete profile”
3. Application deletes the selected profile and all associated measurements to the profile

Use Case 3: Turning on Device

Primary actor: User

Stakeholders and interests:

- User
- Device

Precondition:

- User has the device on hand.

Success guarantee:

- User successfully turns on the device.

Main success scenario:

1. User presses “power on” button
2. Device turns on

Extensions:

1a. The device ran out of battery

1a1. A text label on the UI changes state to tell the user to charge the device

1a2. The user presses the “Recharge” button

1a3. The device charges to at least 1% to have sufficient power to turn on

Use Case 4: Turning off Device

Primary actor: User

Stakeholders and interests:

- User
- Device

Precondition:

- User has the device on hand.

Success guarantee:

- User successfully turns off the device.

Main success scenario:

1. User presses “Power off” button
2. Device turns off

Extensions:

*a. The device runs out of battery

*a1. The device immediately turns off without the user pressing the “Power off” button

2a. Any ongoing measurements are discarded (Use case 9)

Use Case 5: Taking a Measurement

Primary actor: User

Stakeholders and interests:

- User
- Application
- Device

Precondition:

- User has installed the application on their mobile device.
- User has the device on hand.
- User has created a profile in the application (use case 1)
- Device is turned on (use case 3)
- Device has more than 0% battery

Success guarantee:

- User successfully takes a measurement in the application.

Main success scenario:

1. User selects their profile in the profile dropdown menu
2. User presses “Login” button
3. User presses “Take Measurement” button
4. User applies probe on skin to the indicated 24 points
5. For each point probed, the corresponding measurement value is displayed
6. Application displays “measurement complete”

Extensions:

*a. Device runs out of battery

    *a1. The user recharge the device until sufficiently charged

4a. Device runs out of battery during a measurement

    4a1. Any ongoing measurements are discarded (Use case 9)

    4a2. The user recharge the device until sufficiently charged

    4a3. The user retake the measurement

Use Case 6: Viewing History

Primary actor: User
Stakeholders and interests:
- User
- Application

Precondition:
- User installed application on their mobile device.

Success guarantee:
- User is able to view their history in the application

Main success scenario:
1. User selects their profile in the profile dropdown menu
2. User presses “Login” button
3. User presses “History” button
4. Application displays all measurements for the profile

Use Case 7: Viewing Summary

Primary actor: User
Stakeholders and interests:
- User
- Application

Precondition:
- User installed applications on their mobile device.

Success guarantee:
- The user successfully accessed their profile’s summary view

Main success scenario:
1. User selects their profile in the profile dropdown menu
2. User presses “Login” button
3. User presses “Summary” button
4. Application displays the Summary Window for the logged in user
5. User clicks on one of the past measurement buttons
6. Application displays another window showing the meridian values of the selected measurement

Use case 8: Viewing Recommendations

Primary actor: User
Stakeholders and interests:
- User
- Application

Precondition:
- User installed application on their mobile device.

Success guarantee:
- The user successfully accessed the recommendations view

Main success scenario:
1. User selects their profile in the profile dropdown menu
2. User presses “Login” button to log into their profile
3. User presses “Recommendations” button
4. Application displays the recommendations

Use Case 9: Interrupted Measurement

Primary actor: Application
Stakeholders and interests:
- Application
- Device

Precondition:
- Device is on
- Device battery is near 0%

Success guarantee:
- Device shuts down gracefully, and measurement is discarded
- Application displays to check connection of device

Main success scenario:
1. Device turns off (Use case 4)
2. Discard any in-progress measurements
3. Prompt the user in application that the device is disconnected

Design Discussion

Design Pattern

The system uses the observer design pattern, where the device is the subject, and the MainWindow is the observer. Whenever the Device takes a measurement, it sends a signal with the value it measured to the MainWindow.

Battery Functionality

The device uses a QTimer to handle battery drain and recharging. Once it reaches 0%, device functions are disabled until it is recharged. The device has a “Apply on skin” button that simulates applying the probe on skin.

Data Storage

The history object contains the SQL database, which stores the profiles and the measurement tables. On application startup, all profiles are read and Profile objects are created. For each measurement that corresponds to the profile with the same ID, measurement objects are created and are stored in the Profile object. On profile deletion, all associated measurements are also deleted from the measurements SQL table.

UI Navigation

The GUI is made up of Menus. The User can navigate through it by pressing buttons, which directs them to its respective page. The profile menu lets the user create, delete and log in to a profile. In the profile creation page, fields are given to enter info associated with the profile. Once the fields are all filled and the “Create user” button is pressed, a Profile object is created and stored in the profiles vector and in the SQL database. Upon logging in, the user is given options to start a measurement, view history, recommendations and summary. The history menu offers a more detailed view of all past measurements for the user. The summary menu gives an alternative, condensed way to view the measurements.

Taking Measurements

Once a measurement is started, MainWindow begins listening to the device and creates a new Measurement object. The device generates signals that are sent to the handleProbePressed slot, adding the value to the measurement object’s meridianValues vector. If there is an ongoing measurement and the device turns off or the user backs out of the measurement menu, the measurement is discarded. Once the user measures the 24 points, the measurement is stored to the SQL database.