

Team Project: Developing and testing a software-based prototype of Neureset - Direct Neurofeedback EEG device

USE CASE 1: USER USES NEURESET DEVICE

Primary Actor: Device user

Stakeholder and Interests:

User - Wants to run a session using the Neureset device to receive treatment

Precondition: The user has placed the 21 electrodes and the headset on their head and has powered on the Neureset device

Success guarantee: The user has successfully received a treatment using the Neureset device

Main success scenario:

1. The user has started a session on the handheld device
2. Over a period of a minute, the Neureset device calculates an initial overall baseline average frequency for all 21 EEG sites, concurrently, at the same time
3. The Neureset device reads a signal from 1 of the 21 EEG sites on the headset
4. Over a period of a minute, the Neureset device creates a baseline average frequency using that 1 signal
5. The Neureset turns on a green light that flashes, indicating that the treatment is being delivered
6. In a single second, the Neureset adds an offset frequency of 5hz to the baseline average frequency every 1/16th of a second
7. The Neureset then recalculates the baseline average frequency
8. The Neureset adds another offset frequency of 5hz and repeats the process every 1/16th of a second for the duration of that single second.
9. The Neureset turns off the green light after that second, indicating that the treatment has stopped
10. The Neureset proceeds to choose the next EEG site and repeats steps 3-9
11. The Neureset continues to reapply those steps until all 21 EEG sites have been activated
12. Over a period of a minute, the Neureset device calculates another overall baseline average frequency for all 21 EEG sites, concurrently, at the same time

USE CASE 2: NEW SESSION MENU OPTION

Primary Actor: Device user

Stakeholder and Interests:

User - Initiates a new Neurofeedback session using the Neureset device

Precondition: Neureset device is powered on and EEG headset is correctly positioned

Success guarantee: The user has successfully started a new session

Main success scenario:

1. User selects the "New Session" option from the Neureset device menu
2. Once contact with EEG electrodes is established, the Neureset device turns on a blue light
3. The Neureset device starts a timer
4. Go to UC-1 (User uses neureset device)

Extensions:

- 2a. If contact is lost the red light flashes, the session pauses and the Neureset device

starts beeping

2a1. Reestablish contact with the device

USE CASE 3: SESSION LOG MENU OPTION

Primary Actor: Device user

Stakeholder and Interests:

User - Wants to display the session log history of the Neureset device

Precondition: The Neureset device is powered on

Success guarantee: The user can successfully see the session log history of the Neureset device

Main success scenario:

1. The user selects the "Session Log" option from the Neureset device menu
2. The Neureset device displays the time and date of the previous sessions
3. The user can scroll through the different sessions on the device
4. The user can upload the Neureset device data to a PC
5. On the PC, the user can also see the before and after baseline average frequencies of each EGG site, taken during the overall baselines at the beginning and end of the session, compared side by side as a numerical value

USE CASE 4: DATE AND TIME MENU OPTION

Primary Actor: Device user

Stakeholder and Interests:

User - Wants to modify the date and time setting on the Neureset device

Precondition: The Neureset device is powered on

Success guarantee: The user can successfully change the date and time on the Neureset device

Main success scenario:

1. The user selects the "Date and Time" option from the Neureset device menu
2. The user can change the date of the Neureset device by inputting a new date
3. The user can change the time of the Neureset device by inputting a new time

USE CASE 5: PAUSE SESSION

Primary Actor: Device user

Stakeholder and Interests: User - Wishes to temporarily pause an ongoing Neureset session.

Precondition: Neureset device is currently running a session.

Success guarantee: The session is successfully paused, and the device waits for user interaction.

Main success scenario:

1. User selects the "Pause" option from the menu during an ongoing session.
2. The session timer stops.
3. The Neureset device stops delivering treatment, and the green light indicating treatment ceases.
4. The device waits for user interaction to resume the session.

Extensions:

5a. If the session remains paused for more than 5 minutes, and contact is not reestablished, the device automatically turns off, terminating the session.

USE CASE 6: RESUME SESSION

Primary Actor: Device user

Stakeholder and Interests: User - Intends to resume a paused Neureset session.

Precondition: Neureset device session is paused.

Success guarantee: The paused session is successfully resumed.

Main success scenario:

1. User selects the "Resume" option from the menu during a paused session.
2. The session timer resumes counting down from the point of interruption.
3. The Neureset device continues delivering treatment, indicated by the green light flashing.

Extensions:

6a. If contact with the EEG electrodes is not reestablished within 5 minutes after resuming the session, the device automatically turns off, terminating the session.

USE CASE 7: SESSION INTERRUPTION DUE TO LOW BATTERY

Primary Actor: Neureset device

Stakeholder and Interests: Device - Requires user attention due to low battery.

Precondition: Neureset device battery level is critically low.

Success guarantee: The user acknowledges the low battery warning and takes appropriate action.

Main success scenario:

1. Neureset device detects critically low battery level.
2. The device displays a low battery warning on the screen.
3. The red light flashes intermittently to draw user attention.
4. The device emits a beeping sound to alert the user.
5. User acknowledges the low battery warning and connects the device to a power source for charging.

Extensions:

7a. If the battery is not charged within a certain time frame after the warning, the device shuts down automatically to prevent data loss.