Use Cases

Use Case 1

- Initiating a New Session

Primary Actor

- Patient / user

Scope

- Neureset Neurofeedback Therapy System

Stakeholder and Interests

- User: Wants to safely and effectively receive necessary treatment through direct neurofeedback, with a user-friendly interface and clear instructions.

Preconditions

- The Neureset device is fully charged and in operational mode.
- The user is aware of the instructions on how to interact with the device.
- The EEG headset is correctly positioned on the user's head, ensuring good contact with all electrodes.

Success guarantee/Post conditions

- The user successfully initiates a therapy session.
- The device completes baseline calculations before and after treatment.
- The session provides the anticipated neurofeedback treatment without errors.

Main success scenario

1. The user activates the device to start a new session.
2. The device signals the session's start by illuminating a blue light and starting a timer.
3. It performs baseline calculations, then begins neurofeedback treatment, indicated by a flashing green light.
4. After treatment, the device conducts final baseline calculations, signaling the end of the session.

Extensions

2a. Early Session Termination: If the patient opts to end the session early via 'End Session', the device terminates the session safely.

3a. Electrode Contact Loss: Should electrode contact be lost, the device issues a pause, the red light flashes with an audible alert, and a message for adjustment. It

resumes post-adjustment. If an adjustment is not made within 5 minutes, the device turns off automatically.

Use Case 2

- Pausing and Resuming a Session

Primary Actor

- User

Scope

- Neureset Neurofeedback Therapy System

Stakeholder and Interests

- The user has the flexibility to temporarily interrupt the neurofeedback session without losing progress, ensuring they can manage interruptions or adjust for comfort.

Preconditions

- A therapy session is actively in progress on the Neureset device.
- The patient is aware of how to pause and resume the session using the device controls.

Success guarantee/Post conditions

- The session can be paused and later resumed by the user without losing session progress.
- The device maintains the session's state, allowing the treatment to continue effectively after resumption.

Main success scenario

1. The user presses the 'Pause' button on the Neureset device during an active session.
2. The device pauses the session, signaling this state with beeping.
3. When ready, the patient presses the 'Resume' button on the device.
4. The device resumes the session from where it was paused, continuing with the neurofeedback treatment.

Extensions

2a. Early Session Termination: If the session remains paused for more than 5 minutes, the device automatically turns off, and the session is erased, necessitating a new session to be started by the user for further treatment.

Use Case 3

- Completing a Session

Primary Actor

- User

Scope

- Neureset Neurofeedback Therapy System

Stakeholder and Interests

- User: Wants to conclude their direct neurofeedback session knowing it was completed successfully.

Preconditions

- A therapy session is actively in progress on the Neureset device, with all electrodes maintaining proper contact.
- The user is familiar with the device's basic operation, including how to navigate the menu options.

Success guarantee/Post conditions

- The session is completed successfully, providing clear visual and/or auditory cues of completion.
- The device captures and can display a summary of the session, including baseline changes.
- Session data is ready to be transferred to a PC for further review or record-keeping.

Main success scenario

1. The session concludes automatically after treating all 21 EEG sites or if the patient ends it manually.
2. Final baseline data for all sites are calculated, with immediate session completion signals given through visual and auditory cues.
3. A brief session summary is shown, indicating session completion and availability of detailed data for PC analysis.
4. The user can check the session log for basic details and knows they can upload detailed session data to a PC for further review.

Extensions

- 4a. Detailed Session Review: The user opts to upload the session data to a PC for a detailed review, using the designed UI on the PC to analyze the session's effectiveness.

Use Case 4

- Exporting Session Data to PC

Primary Actor

- User

Stakeholders and Interests

- User: To transfer session logs and detailed data from the device to a PC for further analysis

Preconditions:

- The device has stored the session data and all necessary information
- The device has successfully connected to the PC

Minimal Guarantees

- The system will display a "Transfer data success" message if the transfer is completed successfully.
- In case of failure, the system will display a "Transfer data failed" message and may provide troubleshooting steps or suggest retrying the transfer.

Trigger: The user clicks the “Transfer Data” button

Main Success Scenario

1. The user checks and confirms the connection between the PC and the device.
2. The user initiates data transfer from the device to the PC by clicking the "Transfer Data" button.
3. The PC software receives the data, processes it, and displays the session data, including pre-session and post-session baselines, for detailed analysis.
4. The user receives a "Transfer data success" message indicating the completion of the transfer.

Extensions

- 2a. If the data transfer fails due to a technical issue:
    - The system displays an error message with the reason for the failure and suggests steps to troubleshoot or retry the transfer.
- 3a. The PC software fails to categorize or display the data correctly:
    - The user is prompted to contact support for assistance, and the issue is logged for further investigation by the software development team.

Postconditions

- The session data, including details such as pre-session and post-session baselines, session duration, and date/time stamps, is accurately transferred and available on the PC.

Use case 5

- Setting Date and Time

Primary Actor

- User

Stakeholders and Interests

- User: To let the device accurately record the date and time of each session for correct session logging and history tracking.

Preconditions

- The device is on and is navigable through the main menu.

Minimal Guarantees

- The device provides feedback on the success or failure of the date and time setting.
- In the event of failure, the device maintains its previous date and time settings, or has the ability to ‘rollback’ to previous date and time.

Trigger: The user selects the “date and time setting” option in the menu.

Main Success Scenario

1. The user navigates to the 'Date and Time' setting option in the menu.
2. The device prompts the user to enter the current date and time.
3. The user sets the current date and time using the device interface.
4. The device displays a confirmation message indicating the date and time were successfully set.
5. The device updates its internal clock with the new settings.

Extensions

- 3a. If the user enters an invalid date or time:
    - The device displays an error message.
    - The device prompts the user to enter the date and time again.
- 5a. If the device fails to update the internal clock due to any issue:
    - The device displays an error message indicating the problem.
    - The device suggests the user try setting the date and time again or contact support if the issue persists.

Postconditions

- The device accurately records the date and time of each session, ensuring that session logs are correctly timestamped.

Use case 6

- View session log

Primary Actor

- User

Stakeholders and Interests

- User: access and review the history of their completed neurofeedback sessions. The user is interested in tracking their progress, session frequency, and consistency over time.

Preconditions

- The device is turned on and operational.
- There is at least one completed session stored in the device..

Minimal Guarantees

- The system will show an error or notification if no session logs are available.

Trigger: The user selects the “View Session Log” option in the menu.

Main Success Scenario

1. The user turns on the device and accesses the main menu.
2. The user navigates to and selects the "Session Log" option from the menu.
3. The device displays a list of completed sessions, including dates and times for each session.
4. The user scrolls through the session history, reviewing the dates and times of their sessions.

Extensions

- 2a. If no session logs are available:
    - The system displays a message indicating that there are no session logs to view and suggests starting a new session.
- 4a. The user selects a specific session log entry:
    - The device displays the available session details.

Postconditions

- The user successfully views the list of completed sessions, including dates and times.

- The user gains insights into their session history.

Use case 7

- Low Battery Handling

Primary Actor

- User

Stakeholders and Interests

- User: to ensure that the device has enough battery to complete sessions without interruptions. Interested in maintaining device usability and avoiding session disruption due to battery depletion.

Preconditions

- The device is in use or has been turned on by the user.
- Battery level monitoring is active at all times when the device is on.

Minimal Guarantees

- The device is in use or has been turned on by the user.
- Battery level monitoring is active at all times when the device is on.

Trigger: Trigger automatically when the battery level reaches a predefined low level threshold while the device is on.

Main Success Scenario

1. The device continuously monitors its battery level during operation.
2. Once the battery level falls to a low threshold (e.g., 20% remaining), the device automatically triggers a low battery warning.
3. The device displays a visual and/or auditory notification alerting the user of the low battery status.
4. The notification advises the user to charge the device soon to ensure uninterrupted use.
5. The user acknowledges the notification and plans to charge the device.

Extensions

- 3a. If the user continues to use the device without charging:
    - 3a1. The device provides subsequent warnings as the battery level decreases further.

    - 3a2. If the battery level becomes critically low (e.g., 5% remaining), the device may enter a power-saving mode to extend usability until the user can charge it.
- 5a. If the user does not acknowledge the notification:
    - 5a1. The device repeats the low battery alert at regular intervals until the battery is critically low or until the user acknowledges the alert.

Postconditions

- The device automatically updates battery status indicators as the battery drains
- The battery turns into charging mode if it is connected to the power..