ID	Requirement	Related Use Case	Fulfilled By	Test	Description
1	The application interface contains all the main components	N/A	MainWindow.ui	Run the simulator in Qt to observe the UI	Using Qt's built-in user interface, the HeartWave device was modeled to replicate its physical counterpart. The user interface includes clickable buttons that allow for easy interaction with the device. The user interface will also have menu options and the display graph.
2	Once the device turns on, the display menu options as default on the session screen	N/A	MainWindow.ui, Menu	Run the simulator to see if the screen starts with a black screen and displays the "MAIN MENU" once the power button is pressed.	Once the device is first opened, it should remain off until the user has pressed the power button to turn the device on. Once the device has been turned on, the menu will display the following options: start new session, settings, history, reset.
3	The user can start a new session, and display the main HRV graph, as well as the metrics on the screen	UC-01	MainWindow.ui, Menu, Session	Once the user is at the main menu, select the "NEW SESSION" option to see if the device will redirect to the session screen.	When a user wants to start a session, they can select the "NEW SESSION" option which will redirect the user to the session screen. While on the session screen, the user should be able to see their HRV on a graph, their current coherence score, the length of their session, and their achievement.
4	The user should be able to adjust their challenge level	UC-02	MainWindow.ui, Menu	From the "SETTINGS" menu, select the "LEVEL" option. This should allow the user to select a challenge level and have the device adjust accordingly.	Through using the buttons on the device, the user can navigate to the "SETTINGS" and "LEVEL" menus to see a list of challenge levels (Beginner, Intermediate, Advanced, Expert). Once the user selects a challenge level, the device will set the threshold values according to the selected challenge level.
5	The device should have a light that changes red, blue,	UC-01, UC-02	MainWindow.ui, Menu, Session	Upon changing the challenge level, the user can navigate to the menu	Once the user has changed their challenge level, and the device has changed its threshold, the user can return to the menu by pressing the menu button

	or green indicating low, medium, or high coherence, depending on the challenge level			and start a new session. During the session, the device will display a corresponding red, blue, green indicating low, med, or high coherence, depending on the challenge level.	or going back using the back button. Once the user starts a new session, their coherence score corresponds with the light. The device reads the coherence and heart rate data from text files for the different cases. The text files are found under the resources/data folder. The heart rate and coherence data files to be read are in the MainWindow constructor. These include: low.txt and low_coherence.txt, med.txt and med_coherence.txt, high.txt and high_coherence.txt, mixed.txt and mixed_coherence.txt, short.txt and short_coherence.txt,
6	The user can change the breath pacer settings	UC-03	MainWindow.ui, Menu	Upon changing the time interval for the breath pacer, the breath pacer slider in the session screen should reflect the new time interval.	Through using the buttons on the device, the user can navigate to the SETTINGS and BREATH PACER menu to see a list of time intervals (1-30 seconds). The default is 10 seconds. The user can see these changes in place when going to start a new session after adjusting the interval, and the ball will move back and forth to the new set time.
7	The user can end a session by pressing the selector	UC-01	MainWindow.ui, Menu, Database, Session	Start a session and after 5 seconds, press the “OK”, “BACK” or “MENU” selectors to exit and save the session. The session should save in the database, and the device will redirect the user to the summary screen.	Once the user has started a session, after 5 seconds (when the coherence score is first read), the user will be able to save the session whenever the user decides to exit the session. Once the user presses the selector during the session, the user will be redirected to the Summary screen, which would display the metrics, and show the complete HRV graph. The session data will be added to the database. Note: If the whole text file is read, it will essentially have the same effect as the user manually selecting the selector to end a session

8	The user can prematurely end a session	UC-01	MainWindow.ui, Session	Start a session and before 5 seconds, exit the session. The device should inform the user that there was not enough data to save a session.	If the user starts a session and decides to exit prior to 5 seconds, then there will be no coherence data. Thus, the device will inform the user that there is not enough data to save this session.
9	A symbol on the screen indicates an active pulse reading. The session ends without saving when HR contact is lost	UC-04	MainWindow.ui, Session	When the user starts a session, the HR Contact symbol should turn red. If HR Contact is lost, the symbol turns black, the user is redirected to the menu, and the device will inform the user that the HR contact has been lost.	The device has a symbol at the top left displaying a black heart, representing no heart contact when the device is turned on. Once the user starts a session, it will display a red heart, indicating that there is contact. However, once the user loses heart contact, which in our test, is when the line being read is -1, the device will inform the user that HR contact has been lost. The device will not save that session data, and the user will be redirected back to the menu screen. The text files to test for this is the: hr_contact_lost.txt for the heart rate data
10	The device becomes non-functional when the battery level reaches 0	UC-05	MainWindow.ui	Drain the battery until it reaches 0 and the device turns off. All button functionality should be disabled.	When the battery level reaches 0, the MainWindow class will turn off the simulator and will disable all of the buttons until the battery is greater than 0 percent.
11	Saved session data saves the challenge level, percentage of time in different coherence levels, average coherence, length of session, achievement score, and entire HRV graph.	UC-01	MainWindow.ui, Database, Session	Start a new session, let it run for a minimum of 5 seconds to allow it to be saved to the database. Once the session is terminated, view the saved key metrics on the summary screen.	Upon exiting a session, the Database class will store the key metrics in the QSqlDatabase. Each session will have data on the challenge level, percentage of time in different coherence levels, average coherence, length of session, achievement score, and data for the HRV graph (length of time and heart rate data).

12	Session data is stored in persistent storage	N/A	Database	View a session in the “HISTORY” menu. Restart the application to see if the session is still there.	The Database class is used to create tables, insert/delete, and query data. The Database class will insert session objects created by the MainWindow class into the database and have sessions retrieved to view.
13	The user can view a session from the history	UC-08	MainWindow.ui, Menu, Database	From the “HISTORY” menu, select the “VIEW” option to view all sessions currently saved to the device.	Through using the buttons on the device, the user can navigate to the “HISTORY” and “VIEW” menus and see a scrollable list of all the sessions the device has run since they were last cleared. These records are retrieved via the Database class.
14	The user can delete a session	UC-07	MainWindow.ui, Menu, Database	Upon deleting a session, go to the view screen and see if that session has been deleted.	Through using the buttons on the device, the user can navigate to the “HISTORY” and “DELETE” menus and see a scrollable list of all the sessions the device has run since they were last cleared. Once the user selects a session, the user can press the selector to confirm the deletion. That session will disappear from the delete screen. If the user goes back to the “VIEW” menu in the “HISTORY” screen, that session will also be gone.
15	The user can reset the device, clearing the history and resetting challenge and interval settings to default	UC-06	MainWindow.ui, Menu, Database	From the main menu, select reset option to clear all sessions currently saved to the device, ensure that all sessions are deleted and that the challenge level is set to 1, and the breath interval is set to 10 seconds.	On the main screen, the user can go to the “RESET” screen, which will then display an option to “CONFIRM RESET”. If the selector is pressed by the user, then MainWIndow will instruct the Database to clear the database and the user will be redirected back to the menu screen.
16	The battery can be charged	N/A	MainWindow.ui	At any time, the user can press the charge button. The battery should go recharge back to 100	Since the device runs on a battery, if the battery reaches 0, then the device will shut off. To prevent the battery from reaching 0, the user can press the ‘charge’ button to fully recharge the battery to 100

				percent	percent.
17	A beep goes off when a new coherence level is reached	UC-01	MainWindow.ui, Session	During a session, if the coherence level changes, the device will inform the user with a beep that the coherence has changed	The device will inform the user using the console on the right side that the coherence level has changed using a beep.