House in Your Head

Team G1-FrigidWaters

Test Specification

Cycle # 2

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Team Members:

Name: Samuel Bever

Name: Michael Conway

Name: Joseph Muoio

Name: Kyle Patron

Name: Kevin Zakszewski

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1 Introduction

1.1 Purpose

The purpose of this document is to document the test specifications for the House in Your Head Project. This is written for test engineers so that they know which tests to perform to make sure the system is functioning properly. This section is the introduction. The following sections lay out Functional Tests, Usability Tests, Performance Tests, and Compliance Tests.

1.2 References

This document References the Software Requirements Specifications document in Sections 2 and 4. Please see the SRS for descriptions of the functions of the system and for performance requirements of the system.

2 Functional Test Specifications

2.1 SR205 - Calibrate

2.1.1 T205-01 - Assisted Calibration

Requirement	Deriving calibration parameters for a Patient
Conditions	A Patient and a Caretaker are present and in possession of an Emotiv device and a computer with the software installed. The Patient is wearing the Emotiv device.
Procedure	1. The Caretaker initiates the calibration procedure. 2. The Patient responds to prompts from the graphical interface to think particular thoughts, until the system indicates that it is finished.
Expected Results	An appropriate configuration is generated for the patient and stored on the computer.
Actual Results	

2.2 SR210 - Activate menu via EEG

2.2.1 T210-01 - Activate menu via EEG

Requirement	Bringing up the program menu
Conditions	The Patient, who has completed calibration, is wearing the Emotiv device. The software is running but in the idle state.
Procedure	1. The Patient thinks the thought that has been mapped to menu activation.
Expected Results	The menu is displayed on the computer screen.
Actual Results	

2.3 SR215 - Perform Home Automation Action

2.3.1 T215-01 - Turn Lights On

Requirement	Turning a connected light on
Conditions	The software is running and connected to an Insteon light control device. The Patient has completed calibration. The menu is showing.
Procedure	1. The Patient navigates the menu to the desired light device. 2. The Patient selects the Turn On action. 3. The Patient confirms the action.
Expected Results	The light turns on. The program returns to the idle state.
Actual Results	

2.4 SR215 - Perform Home Automation Action

2.4.1 T215-02 - Change Television Channel

Requirement	Changing the channel on a connected television
Conditions	The software is running and connected to an Insteon television control device; the television is on. The Patient has completed calibration. The menu is showing.
Procedure	1. The Patient navigates the menu to the desired television device. 2. The Patient selects the Change Channel action. 3. The Patient selects a channel number. 4. The patient confirms the action.
Expected Results	The television changes to the selected channel. The program returns to the idle state.
Actual Results	

3 Usability Testing

3.1 Tasks

Several of the tests in this section refer to a series of tasks to be completed by a tester. Unless otherwise specified, this series of tasks shall include the following:

1. Calibrate for user
2. Turn lights on and off
3. Turn television on, change channel, change volume, turn off.

3.2 Development/Prototyping Phase

Phases	Prototyping/Development, Testing, Final
Requirement	Software Functionality
Test Procedure	A number of testers are selected and briefed on the system. This briefing includes intended use, target users, and basic system functionality. The tester then completes a series of tasks using out system while speaking their thought process out loud. The team member monitoring the test takes notes and asks the user for more feedback when necessary. It is important that the team member does not interfere or help the tester in completing their tasks. The goal of this test is to ensure that the system is intuitive for the user to use on a basic level and that the system behaves in an expected manner.

3.3 Testing Phase

Phases	Testing, Final
Requirement	Aesthetic Usability
Test Procedure	A tester is briefed on the system. This briefing includes intended use, target users, and basic system functionality. The tester than completes a series of simple tasks throughout the entire system. The team member monitoring the test asks the tester for feedback in regards to the system's aesthetics. This test ensures that the components of the system are readable and are clear and easy to understand. This test should be done in the latter stages of the testing phase or in the final phase.

Phases	Testing, Final
Requirement	Error Prevention and Recovery
Test Procedure	The tester is given a set of tasks to complete that intentionally cause errors. Once the error occurs, the team member will look for feedback from the tester on how they would intuitively recover from the error shown. After the error-inducing task is complete, the team member asks the tester what they think caused the error to be shown and what could they do in the future to prevent it. This test can be completed during any phase, but should be more heavily focused on during the testing phase.

3.4 Final Phase

Phases	Prototyping/Development, Testing, Final
Requirement	General Usability
Test Procedure	A tester is briefed on the system. This briefing includes intended use, target users, and basic system functionality. A team member monitoring the test asks the tester to complete a series of tasks using the system. As the tester moves through each step to complete the task, they are asked to vocally expresses their thought process and express anything that they think is unclear or have an issue with. This can include confusing system behavior, unclear user interface design, counterintuitive design, missing functionality, ease of use, or anything else the user feels would improve the usability of the system. This test can be completed at any phase of the development process in order to catch any usability issues early. However, there should be a large focus on this test towards the final phase when the system is nearing release.

Phases	Final
Requirement	Consistency and Standards
Test Procedure	A tester is briefed on the system. This briefing includes intended use, target users, and basic system functionality. A team member monitoring the test asks the tester to complete a series of tasks using the system. As the tester moves through each step to complete the task, the team member looks for feedback regarding the consistency of the system. This includes design consistency as well as consistency in functionality. This test also covers general system standards. This means ensuring the layout, functionality, and design follow the standards set for similar user applications. This test can be completed earlier, but should be included in the final phase.

Phases	Final
Requirement	Documentation
Test Procedure	A tester is not briefed on the system and asked to read and review the documentation on the system. The team member distributing the test looks for feedback regarding the documentation itself. This includes factors such as clarity, completeness, and overall usefulness. Then, once the tester feels they are comfortable enough with the documentation, they are asked to complete a series of tasks. This test ensures that the documentation is clear, concise, and helpful to the user. This test should be done in the final phase near the release when all the documentation is complete.

4 Performance Testing

4.1 SR305

Requirement	The system must use less than 512 MB of RAM at all times while running.
Test Procedure	Start the system on a machine meeting the minimum system requirements. Monitor the memory usage of the program during the following: 1. User calibration 2. Menu selection and automated home response 3. Idle time Verify that memory usage remains below 512 MB.

4.2 SR310

Requirement	The system must use less than 5 GB of persistent storage space when installed.
Test Procedure	Install the system on a machine meeting the minimum system requirements and check the size of the installation directory. Make sure it is below 5 GB.

4.3 SR315

Requirement	The system must run smoothly on a 3.2 GHz Intel i3 processor.
Test Procedure	Install the system on a machine with these specifications and meeting the other minimum system requirements. Perform the following tasks and verify that it runs smoothly (i.e. without stuttering or becoming unresponsive): 1. User calibration 2. Menu selection and automated home response 3. Idle time

4.4 SR320

Requirement	The system will support one and only one terminal.
Test Procedure	Launch the program. Verify that it runs on one machine.

4.5 SR325

Requirement	The system will support one and only one user at a time.
Test Procedure	Launch the program. Verify that it runs for one user.

4.6 SR330

Requirement	90% of time, menu selection must take less than 5 seconds.
Test Procedure	Time a trained user making a sequence of at least 20 menu selections. Verify that at least 90% of the selections are made correctly in less than 5 seconds.

4.7 SR335

Requirement	A trained user must be able to select 10 options within 2 minutes.
Test Procedure	Time a trained user making a sequence of 10 menu selections. Verify that this takes under 2 minutes.

5 Compliance Testing

There are no functional or technical standards with which the system must comply.

Table of Contributions

Section	Writing	Editing
1	Joe Muoio	Michael Conway
2	Kevin Zakszewski	Michael Conway
3	Sam Bever	Michael Conway
4	Joe Muoio	Michael Conway
5	Michael Conway	Michael Conway

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Signature: Samuel Bever Date: 02/02/2015

Signature: Michael Conway Date: 02/02/2015

Signature: Joe Muoio Date: 02/02/2015

Signature: Kyle Patron Date: 02/02/2015

Signature: Kevin Zakszewski Date: 02/02/2015

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