# Legend of Iris

## Game Testing Report

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What are the metrics for measuring if a game is accessible? There are no set of accessibility guidelines for games that we can just follow to ensure our game correctly implements them. Games are also different from regular software applications due to their natural requirement of what the interaction with a user should provide: games should be fun. The problem with this additional constraint is that "fun" is not simple to measure since that is a subjective measure depending of the players' preference. This game has also an essential and serious goal associated with it, being able to train blind kids to orient better in an environment, just by the use of sounds. Taking all of this in consideration, we splitted this evaluation into two parts:

- **Quantitative analysis:** we will collect raw data about the performance of the players, and observe how well a disabled player is able to play the game. This will allow us to analyse the degree of difficulty in each part of the game, it's learning curve and it's improvement ratios. This data will include players' game score, accuracy percentages, time taken to perform certain tasks, and hardware effectiveness during the game play.

- **Qualitative analysis:** here we will try to measure the effectiveness of the game to fulfill the initial goals and the "fun" component. The main question to be answered by this analysis is: Is the game able to help to develop blind people's skills and at the same time fun to play? To make it a success, and accomplish our initial goals, the game must provide a fun and engaging experience, otherwise no one will want to play it and the game will lose its purpose, despite players being able to use it efficiently in terms of accessibility. This will also include metrics to evaluate the quality of the sound simulation used throughout the game.

# Test Session Design

In order to make a complete and thorough analysis of the whole experience, the test session will be divided into three separate phases, each one with a slightly different objective and contribution to the final analysis that will be performed.

## 1. Introduction

**Estimated duration:** 10 minutes.
**Objective:** Introduce our project, our team, explain how the game works and inform the test subjects on what the test session will consist of. This includes the realization of a small survey to gather demographic information, knowledge about the player's background, skills and experiences on games in general.
**Primary data gathered:** Survey with a set of 9 questions.

## 2. Demo

**Estimated duration:** 45 minutes.
**Objective:** Give the player a chance to interact and play with the game, providing as little support as possible so that the player is able to figure out the solution by himself. In this phase we will record a few statistics about the players' performance in the game and the number of interactions with the evaluator to overcome a difficulty. In this phase, we also expect to get an idea of the game's ability to provide fun, by taking a careful look into the player's reaction and enthusiasm while playing it.
**Primary data gathered:** Statistical data about the player's performance in the game.

## 3. Closure

**Estimated duration:** 20 minutes.
**Objective:** Finish the demo and make a small informal interview regarding the whole game experience. This will be focused on the qualitative analysis, and therefore is meant for us to evaluate the success of the "fun" component, the capability of the game to teach and/or enhance orientation skills, and to get the essential auditory feedback related to the sound simulation present in the game.
**Primary data gathered:** Survey with a set of 18 questions.

Both surveys and the statistical data to be collected in the demo are available in the Appendix 1 of this report. The results of the testing sessions are presented in the Appendix 2.

# Test Session Environment

For the tests to be as significant as possible, and provide us with real valuable information about the game's success amongst visually impaired children, we set out to find some of them to test our game,

and not just test it with sighted kids with the game visual aids turned off. Finding test subjects for the sessions was itself a rather difficult task, but eventually we contacted the Bartiméus organization in Zeist and were able to schedule some sessions. Bartiméus is a Dutch organization who provides care, support, education and training for partially sighted or blind people. The organization aims to improve their quality of life providing personal advice, guidance and knowledge. After speaking with Henk Snetselaar, a teacher at the school, we got the opportunity to go to one of his classes and test the game with some of his students. The tests took a bit longer than we originally planned, and we used the Oculus Rift device in every one of them. Since we only had one Oculus Rift, with the time we had we only got to perform 4 sessions. The test subjects were also a bit older than we would like, but there weren't any young children there that day. The results of these tests can be found in Appendix 2.

## Sessions Information

**Date:** 15/01/2015
**Time:** 10:00 to 12:00
**Location:** Bartiméus Education, Van Renesselaan 30a, Zeist, The Netherlands
**Contact:** Henk Snetselaar (hsnetselaar@bartimeus.nl)
**Subjects:** 3 boys and 1 girl, between 16 and 19 years old, and with visual capabilities between 4% of vision and total blindness.
**Conditions:** The tests were performed in one of our computers, while the subject was seated in a movable chair, so that (s)he could do a full rotation with the Oculus Rift, in a desk available at the classroom.

# Results

In terms of obtained results, we are aware that 4 is not a sufficient number of tests to come up with definite and unambiguous conclusions about the success of our game in all of our initial goals. Having said this, they did allow us to have a sense of what we actually did right and the direction we need to follow in order to provide a really good experience, and learning tool for visually impaired children to improve their orientation skills, as well as have some fun.

## Background, Skills and Past Experience

Contrary to our initial beliefs, only one of the subjects had only played an audio game once. The rest of them have tried quite a few, and one of them even publishes tutorials online for some of them. The most common source of games played by them was either the iPhone or the website www.audiogames.net. This gives us reason to think that there's really an active community of people developing good audio only games, and that the visually impaired are aware of such fact, and usually play a lot of games in a regular basis. This made their feedback even more valuable for us.

## Game Functionality

In terms of game functionality, the results are evidence that we performed a more than satisfactory job with the features implemented in the game. Every subject liked playing the game, and thought that the sound engine used in it, combined with the clear sounds reproduced with it, were very good. There were some complaints about some sounds that were a inaudible (mainly the spirits in the first level), but the main opinion was that they were easily recognizable and good enough to be located. The major difficulty mentioned by two of the subjects, related to sound, was knowing if the sound was coming from the front or the back. This was already a know problem to us, that has to be worked on in the next version of the game. As to the controllers, they really liked that we provided Oculus Rift as a head tracking device, making the game even more immersive, but found it too big and heavy. To solve this, we could replace the Oculus Rift with a custom version of headphones with some kind of gyroscope sensor adapted to it, that would remove the bulk and weight of the Oculus Rift, while providing the same function.

## Player Engagement

The results show that this particular set of subjects didn't find the story of the game particularly interesting, and would like it too be less noticeable and more appropriate to their age. This results don't really necessarily add something negative to our game, because we originally developed this story with young children in mind, not teenagers, but it also implies that we might have more success if we can make it adapt itself to the player's age, instead of just making a static version of it, only destined for a specific range of ages. They also found the initial sections of the game quite easy, and therefore not so interesting. Despite this, they all showed interest in playing the complete version of it, because they found it fun to play, especially when they got to the hardest parts, the ones that posed a challenge to them.

## Achievement of Proposed Goals

The achievement of the proposed goals where not all corroborated by the results obtained. Those related to the serious component, the capability of providing a way to teach visually impaired children navigation and orientation skills, could not really be concluded from the answers provided by the testers. Most of them said this game might not help them but that it might be helpful to younger kids (our main target), because they are less experienced at orientation. We can also see from the results that only one of them got to a harder level, which might also indicate why they didn't think the game could help them, they only played the easy levels. The one that did reach a harder level, really liked the challenge and took a lot more time to pass it.

# APPENDIX 1

## Introduction Survey

1. Gender?
2. Age?
3. Are you completely blind? If not, what's your remaining eyesight?
4. Were you born blind? If not, at what age have you become blind?
5. Do you have any other disability? If yes, which one?
6. Have you ever player video games before? If yes, which ones?
7. Do you know any games that are meant or able to be played by blind people? If yes, which ones?
8. Are you accustomed to using a keyboard?
9. Have you ever used any other type of device to interact with a computer/console?

## Demo Statistical Data

1. How much time did (s)he spent on the settings menu?
2. Was (s)he able to start playing the game without our assistance?
3. Which settings did (s)he go with?

### Tutorial

4. How much time did (s)he spent on the tuturial?
5. Was this the first time (s)he was playing the game?
6. How many times did (s)he need help?
7. Did (s)he skipped the game story?

### Level 1 - Bridge

8. How much time did (s)he spent in each section? 1, 2 and 3.
9. How many times did (s)he fell from the bridge in each section? 1, 2 and 3.
10. How many spirits did (s)he hit in each section? 2 and 3.
11. How many times did he need help in each section? 1, 2 and 3.

Level 2 - Catch Boris

12. How much time did he took to find Boris? The three times.
13. How many times did he need help to find Boris? The three times.

Level 3 - Cross Swamp

14. How many frogs bit him?
15. How much time did he take to cross the swamp?
16. How many times did he need help to cross the swamp?
17. How much time did he take to get to the clearing?
18. How many times did he need help to get to the clearing?

Level 4 - Find Science Bird

19. How many regular birds did he found before the first science bird?
20. How much time did it take to catch the science bird?
21. How many times did he need help to get to catch the science bird?

Level 5 - More Science Birds

22. How many crows did he catch before catching the other science birds?
23. How much time did he need to catch the other science birds?
24. How many times did he need help to catch the other science birds?

End

25. Did he re-change any settings during gameplay? If yes, which ones and did he needed help to do it?
26. How far in the game did he make it?
27. Did he played for the entire demo duration? If not, how much time?
28. Was he able to play the entire time without our assistance?

# Informal Interview

1. Did you have fun playing our game? If not, why?
2. What was the hardest thing for you to do in the game? Can you suggest a way to improve that?

3. Did you find it hard to locate where the sounds were coming from? (ignore this question if it was answered in the previous one)
4. Could you easily hear and recognize the sounds that you heard in the game?
5. Are the navigation controls confusing/hard to use? If yes, what would you prefer?
6. Did you like using the Oculus Rift? Do you think it's more natural and easier to play the game that way?
7. Do you know what echolocation is? If yes, are you able to use it and do you think it would be useful to have it in the game?
8. Would you be interested in playing the rest of the game ?
9. What do you think is missing from the game?
10. Would you replay this game more than once?
11. Did the game's story motivate you to keep playing?
12. List three strong and three weak aspects of the game.
13. What did you think of the overall difficulty of the game?
14. Do you think you could improve your orientation skills with this game?
15. Do you think this game is good to practice listening sounds around you?
16. Would you prefer to have more or less indications on what to do in the game?
17. Do you have any suggestion for us regarding the game?
18. Are you interested in being one of our beta testers in the future to have early access to the game and have your name in our acknowledgements?

# APPENDIX 2

## Session #1

### Survey

1. Male
2. 19 years
3. 4% of vision. Can differentiate a bit of color
4. No, lost it after 9 months
5. I can't walk that well
6. Yes. Operation Black Square and RTR
7. Operation Black Square and RTR
8. Yes
9. A braille line reader

### Demo

1. - (we did it for them)
2. - (we did it for them)
3. Oculus Rift, Xbox controller and the Astound Sound Engine
4. 485s
5. Yes
6. 5
7. No
8. 33s, -, -
9. 2, -, -

### Closure

1. Yes, I liked the sound it makes when I'm walking
2. I couldn't distinguish if the sound was in front or behind of me
3. Yes. If the sound was coming from behind or in front of me
4. Yes
5. It was ok/easy
6. It worked well, but it's a bit heavy

7. You could add it, but it is not necessary. I think it doesn't add that much to the game. And it's kinda hard to use in real-life, I can't do it
8. Yes
9. More sounds in the environment
10. Yes, especially if it had high scores and different difficulty levels
11. Maybe a bit
12. There could be more interesting footsteps. Lucy's sound could be different (all games use bells). The girls voice was good. Beorn wasn't always clear with what he meant. Maybe use actually voices or spoken text.
13. A bit hard after the tutorial
14. Not really. But I'm already good at it
15. Not really
16. Maybe a bit less, it takes too long sometimes
17. More action, or a less childly story
18. Yes

# Session #2

## Survey

1. Female
2. 18
3. Can see a difference between light and dark
4. Shortly after birth
5. Prosthesis for one leg
6. Yes. One, but not that much. Can't remember the name of it
7. Don't know
8. Yes
9. A braille line reader

## Demo

1. - (we did it for them)
2. - (we did it for them)
3. Oculus Rift, Xbox controller and the Astound Sound Engine
4. 520s
5. Yes
6. 8
7. No
8. 236s, 247s, -

9. 4, 1, -
10. 2, -
11. 5, 0, -

### Closure

1. Yes
2. Sometimes the bell is too far away to hear it well
3. Hearing the bell sometimes
4. Yes
5. It's easy to use, and the learning curve it's not too steep, and that's nice
6. Oculus rift was fun to use
7. I think it is hard to do it in real life, and probably in the game as well. Don't really know
8. Yes
9. Nothing really
10. I think so
11. I couldn't really follow the story because I don't speak English
12.
Strong: I like the sounds, when we're close it really sounds like we're there
Weak: I didn't know how to react about the spirits, couldn't hear them very well
13. Good, not to hard, not to easy
14. Not that much, I already know this. But it might work if you're less skilled
15. Maybe
16. More information about the spirits (or probably improve the sound) and it would be better if it was Dutch for me
17. Not really
18. Yes

## Session #3

### Survey

1. Male
2. 18
3. Can see a little difference between light/dark
4. Yes
5. No
6. A lot. 3D velocity. Audio Defense (iPhone). Papa Sangre (iPhone). Adventure at Sea. Audiogames.net
7. 3D velocity. Audio Defense (iPhone). Papa Sangre (iPhone). Adventure at Sea. Audiogames.net

8. Yes
9. A braille line reader

## Demo

1. - (we did it for them)
2. - (we did it for them)
3. Oculus Rift, Xbox controller and the Astound Sound Engine
4. 423s
5. Yes
6. 1
7. No
8. 51s, 203s, 192s
9. 0, 1, 1
10. 3, 0
11. 0, 2, 4
12. 2min 12s, -, -
13. 2, -, -

## Closure

1. Yes. The game has nice sounds, which are surprisingly clear. There's no background noise on them.
2. Spirits were very inaudible. Boris "Boohoo" was very hard to follow (I liked that).
3. Yes
4. Yes
5. Yes, but the oculus is heavy
6. Yes, more realistic. If there were less sounds around me (referring to the room where the session was executed) it would feel like I was there.
7. I think you could
8. Yes
9. Maybe stairs or something
10. I think so
11. Yes, so far I would like something with a vehicle for example
12. Strong: clear spoken text. Nice sound engine.
Weak: there's no reflections and environmental sounds.
13. Easy. The Boris level was harder and more exciting to play
14. I think so
15. Could help, depends on the situation
16. It was ok. Being able to skip the dialogue is cool

17. More similar quests. Maybe something with music as disturbing/disorientating sounds or noises. Can you publish it on audio games.net after it's complete?
18. Yes

# Session #4

## Survey

1. Male
2. 16
3. Yes
4. Since birth
5. No
6. A few. Top Speed 1+2+3, Super egg hunt (easter), Mud Splash
7. Top Speed 1+2+3, Super egg hunt (easter), Mud Splash
8. Yes
9. A braille line reader.

## Demo

1. -
2. -
3. Oculus Rift, Xbox controller and Astound Sound Engine
4. 432s
5. Yes
6. 4
7. Yes
8. 67s, 40s, -
9. 0, 0, -
10. 1, -
11. 1, 0, -

## Closure

1. Yes
2. To follow Lucy sometimes
3. Knowing if the sound is coming from the front or behind was difficult at first, but that part got better later
4. Yes
5. Not harder than expected, but I'm most used to using a keyboard

6. Not much difference. It's just too big to make it feel as natural as it could be.
7. Yes, a bit, but I don't use it
8. Yes, if I know how it works. Which I do now, so, yes
9. A bar, to get some drinks
10. Depends, but if it's a challenge to play, then yes
11. Chasing the fairy motivated me to play more
12. Strong: It's fun to play
Weak: Oculus rift was too big
13. Had a good difficulty level
14. Not sure, but maybe the Boris level (didn't play, but I heard it was hard)
15. Yes
16. It's fine, but story can be left out
17. No
18. Bram Lieftinck