Kandidatuppsats

Gameplay experience with eye tracking

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Abstract

This study is about how a person who is used to play games experiences playing a game with their eyes as input. The participants played a 3D game where the player had to collect coins by moving a ball over them. The participants first tried the game with keyboard as input and then right after only interacting by gazing via screen. The achieved score was recorded both for input from keyboard and input from eye. After the game session the participants were asked to answer two questionnaires that contained questions about their background and questions referring to the game they just played. The experiment was performed in a lab with a TobiiT60 eye tracker. All participants got lower score when they used eye tracking as input but most of the participants found it to be more fun. We reached the conclusion that, with the game used in our experiment, the participants felt that gaining a high score was not the most important. Instead they ranked having fun as a more important factor. Our experiment has shown that using an eye tracker can make a casual game more fun.

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I Introduction

In computer science we find different subfields. There are both theoretical areas, such as programming language or algorithm theories, and applied computer science, for example using artificial intelligence for solving problems in a game. In the following study knowledge from computer game development and programming is combined with human-computer interaction.

Eye tracking technology is a technique used in many areas and the gaming industry is getting more and more interested in using the technique [1].

Previous studies have been made using an eye tracker for input when playing a digital game. At the Cognitive Science Department at Lund University a First Person Shooter (FPS) game, in this case Counterstrike, was studied with the discovery of how realtime data did not correlate with the retrospective perceived attention [2]. Jonsson at Royal Institute of Technology (KTH) in Sweden made a study soon after using Half Life Software Development Kit [3], here the player tested to aim with their eyes and also maneuvering the cameraview via their eyes. At the same time studies were conducted at Swedish Research Defence Agency (FOI) in Linkoping, also in Sweden, where Sennersten (BTH) et al. connected FOI’s HiFi simulation engine using the Battlefield editor [4], [5], [6] logging the 3d collision boxes in real time. The aim was to connect a 3d simulation engine with an eyetracker to be able to both log and steer via eye in real time and look into the shooting. At this time there was a big debate about death shootings at high schools where journalists and media debated and hypothesized that FPS games were the cause of these shooting behaviors. They also looked into how the gun graphic cued vision even if the graphic element was passive within the game/simulation.

A pr-study, also at BTH, was made as a HalfLife mod for Dreamhack [7] where participants were supposed to navigate on a catwalk with the help of a keyboard and the eye tracker (this was not a typical fps gameplay though). The goal was to steer successfully and not fall down.
1.1 Background

Console makers in early years produced controllers with limited capability to make up for the limited controller functions developers had. Game developers and players demanded more control over the games which drove the industry to make more complex controllers [8]. One way to live up to these demands is to use new pioneering techniques and develop new devices. Many games use more advanced input methods (Wii mote, Kinect Playstation Move, Playstation Eye) [9]. Why not eye tracking as an input? If we can track we can steer. Eye tracking technology is a tracking technique that offers information about where on the screen the user is looking [2]. This can benefit both the users and the developers [10]. When a game is being designed it’s beneficial to know where on the screen a player is looking and for how long. This is for making the game more challenging or easier. When things are put in the areas where the player is looking most it will be looked at more. These areas could be a good place to put things that the developer wants the player to focus on. If the game is to be more challenging the designer can put enemies on areas where the player doesn’t look as often. Reaction time is also something that has been studied when it comes to how fast attention can be shifted from one area to another. Furthermore eye tracking can be a way for people with severe motor disabilities to fully control a game [11].

A problem is that physiological data is often more or less noisy which makes it more complicated to classify. A peak can be both positive and negative so data needs to be cross-correlated to sort out ambiguities. This is an ongoing problem all developers using new interaction methods have to deal with.

Beume et al suggests that future research that addresses where on the screen a player is looking when playing Pac-Man could be of psychologically interest when looking at the principles behind measuring interaction [12].

Hagman and Nyholm wondered if it is possible to develop an eye-controlled game for the console based market and what impact it would have on the market itself [1].

1.2 Purpose and goals

The purpose of this study is to compare eye tracking with current gaming technology, ie mouse and keyboard. We want to find out what people who play games, at least once a week, experiences when using an eye tracker in a game, a game that is familiar to them. Our goal is to measure the differences between playing a game with eye tracking as only input and playing a game with mouse and keyboard as input. Since fun is the primary goal of entertainment game design we want to ask questions about what the gamer consider is fun and how it changes depending on what input they use. There are several studies that use different questionnaires to measure the fun of a game. Many of them are of the comparing nature with questions like “Is a more fun than b?”[12]. There were also questions about how difficult or
easy the game was. We also want to find out what score the participant had when playing with
traditional input and with eye tracking so the score can be compared. With this information
the skill level of different players and how well they perform can be measured in both
scenarios.

1.3 Research questions

What do experienced players find more fun when comparing eye tracking with mouse and
keyboard input? Will there be a clear difference in scores depending on the input used?

1.4 Methodology

In addition to our already planned implementation we have also contacted Blizzard to find out
if they may provide us access to source code from Diablo II as an alternative option to making
a game of our own. We are then going to ask participants to try the game with either eye
tracking or with mouse and keyboard. After that they will answer some open and closed
questions. The questions will be of such a nature that we will find out if they enjoyed playing
with eye tracking as input. We will ask a few questions about the participants and what
experience they have with playing games. We will also track the score the participants
achieved.

1.5 Eye tracker

An eye tracker is a monitor that uses image sensor technology to estimate the point of gaze
with an extreme accuracy. An eye tracker does this with the help of mathematical algorithms.
The technique involves tracking of eye movements and recording gaze distribution over time
[9]. The frequency of the Tobii T60 is 60Hz which means an update frequency every 20 ms.

2 The Experiment design

The designing of the game was made to fit the research questions as well as possible, our
game was made as simple as possible to make eye tracking control look similar to the
traditional keyboard input. Music, sound effects and score feedback where added to stimulate
the player. We had Pac-man as a source of inspiration when designing and coding our game
hence the collectables and the ball formed actor but we did not add any enemies.
2.1 Designing the game

The experimental game or also called the stimuli (visual and/or auditive) was made in the C# programming language and Xna game studio 4.0. Xna is a programming environment that is used to create games for Windows, Windows phone and Xbox 360. To connect our game to the Tobii T60 eye tracker we used the tobi sdk that was designed for the .NET framework. The game that was developed using the Xna framework is a simple 3D game where the player controls a ball. The goal of the game is to collect as many golden gears as possible to earn points in a limited amount of time. When starting the game the player will be presented with a menu and the ability to choose input method. The player can choose to use standard keyboard and mouse or the tobi eye tracker system. After a game and when the time limit has passed a screen will be presented which displays the achieved score. The purpose of this game is to measure “fun” in the game using standard input and eye tracking. We are not measuring the physiological biometrics though, we are here measuring what our participants consider being fun in terms of self-evaluation. Therefore the game has a built in timer and a set time limit so that it’s possible to measure how good the player is using standard input and a non standard input (eye tracking). The conclusion will be drawn from how many points the player got when using a method compared to the other and how comfortable the player felt using one input compared to another. For our experiment we made an online questionnaire in Google Docs™ that each participant should answer on. The questionnaires are presented as appendices one and two.

2.2 How the game works

In this section we will look a bit closer on the stimuli. The figures that follow describe how the stimuli works in detail and what the participant is supposed to do when playing this game. The figures also describe the order that was followed when setting up the game to use the Tobii T60 eye tracker as an input method.
The participant starts off by setting the preferred input method in the options menu. In this case we are setting the input to use the Tobii T60 eye tracker so we choose the tobii eye tracking option (see Fig1).
Figure 2 The green dot should be at the start button for 2 seconds of time to start playing the game.

2 seconds is the same amount of time as Hagman and Nyholm used in their game for selecting answers [1]. Since the calibration is not always perfect, the position of the green dot might sometimes vary and not be precise.
When the participant is in the game playing s/he looks in the direction they want the ball to go. The participant is also presented with the score s/he currently has achieved and the time left which are located on the top left corner of the screen. When the participant is controlling the ball s/he will be faced by an obstacle that prevents the ball to move further. The golden gears are placed randomly on the terrain after they have been collected.

2.3 Selecting participants

We wanted to have participants that were gamers or played games on a regular basis, preferably every week. For that reason we tried to use students and teachers from Blekinge Institute of Technology, BTH. Our goal was to find 20 participants for our study, because we then can get a first statistical view upon our research question. We recruited participants by sending email to students at school in the programs “Game programming” and “Technical Artist” we also asked some teachers at school to participate. Another way of recruiting was to ask a teacher to put the text on a page for student-information for the students from “Game programming Master of Science” who is at their fourth year of study. The email is found in appendix 3.

2.3.1 The participants

The 21 participants consisted of 16 men and five women. The age range was from 19 years of age up to the age of 48. The average age was 24 and the median age was 22. Three of the
participants were teachers at BTH and 16 were students at BTH. One of the participants was a friend of a student and one was a former student at BTH. 10 of the participants had a visual defect and eight wore glasses.

2.4 Execution
As a participant entered the lab they were asked to sit down at the computer in front of the eye tracker. We asked if they had used an eye tracker before. All participants got the same instructions. The instructions they got were:
Try to sit in the same position as much as possible.
We are now doing a calibration before the game starts. Follow the dots with your eyes.
You will first play the game using the keyboard as input. You are a ball and you should collect as many coins as possible.
Now you are going to control the ball with your eyes. Look at the start button for two seconds.

During the game session one of us took notes. The score was recorded from both the games. We also made a note if they were wearing glasses or not.

When they finished the game they moved to another computer to answer two questionnaires. The questionnaires are found in appendices one and two.

During the time the participant was answering the questions we exported the recorded video and text to be able to analyze the data later.

After the experiment, we thanked them for participating.

2.5 Equipment
The eye tracker Tobii T60 was used to record the eye movements and positions of the participants during the time when they played the game without keyboard and mouse as input. The Tobii T60 eye tracker was running Tobii studio which we used to analyze and export the recordings of the gameplay. We also used Tobii studios default calibrator to calibrate the eye tracker so it adjusts to the participants eyes. The computer that had the eye tracker connected to it was running the Windows XP operating system.
Figure 4 The figure shows an eye tracker from Tobii Technology [10].

2.6 Qualitative and quantitative data

When we made our experiments we saved quantitative data such as replays of the participants playing the game with both eye tracking and keyboard and mouse. We also exported and saved log files on the participant which shows where s/he looked on the screen, this is called gaze data. The data recorded is objective and when we interpret it, the outcome becomes subjective. We also made a questionnaire for the participants to answer on with both open and closed questions so we can save the qualitative data and analyze it for our results.

We can quantify the questions with closed answers, such as age and vision defects. Other questions, with the opportunity to write free text, bring more qualitative data. We wanted to use both types of data in our study to be able to look at the result from different views.

2.7 Analyze

We analyzed the data from tobii by looking at the movies from the game-session. First one of us looked at them separately and took notes and tried to subjective find similarities and differences between the movies. After that the other one of us did the same thing. We did this to be able to compare our findings with each other. We didn’t have time, within the scope of
this project, to analyze all the text data that was saved since the amount of data was very large.

3 Results

The result contains answers from the questionnaires, the obtained score and some of the recorded data from the eye tracker.

3.1 Gaming habits among the participants

When we are playing games we may not necessarily play them in the same way or we may not even like the same games. So in this study and with the research question in mind we will here present some interesting findings in relation to our participants.

3.1.1 Frequency of playing

Some people may play several times a day and some might never play at all. Our participants have shown their habits in playing via our questionnaire and most of them played games 5-6 times per week. See figure 5 for more details.

Figure 5 Frequency of playing games.

When looking at our 21 participants above we can quickly see a distribution of playing behavior which tells us that over 50% play over several times a week.
3.1.2 Reasons for playing
Most of the players played games because they found it fun. Some noted that they played games to relax, kill time, to avoid thinking about things that bothered them or to spend time with friends.

3.1.3 Most commonly played genre
Some of the participants played more than one type of game. Diagram 1 shows the different types of games the participants played. The most common played genre was Role Playing Games (RPG).

![Type of genre played.](image)

3.1.4 Feeling to achieve
The feeling most of our participants wanted to achieve was the feeling of being entertained. But, as shown in diagram 3, there were other reasons for playing games than that.
Figure 7 Desired feelings to achieve when playing games.

3.2 Score summary

When the participants played the game they gained the best score when they used keyboard as input. The difference between input from keyboard and eye-input was at its most 174 points for a single participant. The highest score gained when using keyboard as input was 225 points. The highest score gained when using eye-input was 147 points.
Figure 8 The diagram shows the score that the participants achieved. The blue bar shows the score gained when using keyboard as input and the green bar shows the score using eye-input. P01 is participant one and the numbers to the left is the score gained.

3.3 Perceived difficulty

15 participants noted that, on a scale one to five, where five is easy and one is impossible, they stated that using their eyes as input was graded a two. Two of the participants graded a four. One participant graded a one and three participants graded a three. The result is shown in figure 9.

Figure 9 The numbers on the x-axis shows how difficult the participant thought it was to steer the ball with their eyes.
3.4 The fun factor

The participants were asked to rate how fun the game was in general. The game was rated on a scale from one to ten. The lowest rating was a two and the highest a nine. The average was 5.8 and the median was six. The participants were also asked which of the games they found more fun, the one with keyboard as input or the one when they used their eyes. It was clear that playing with the eyes as input was more fun than playing with keyboard as input. Three of the participants answered that the game where they used keyboard as input was more fun than using eyes as input.

3.5 Comments from the participants

Some of the participants made comments during the game when they used their eyes as input. Some of them laughed and said: “No!” or “Oops!” Three of the participants said: “This was hard!” See appendix four.

3.6 Glasses

Five of the participants wore glasses during the game session. One of them took them off because he found them to be disturbing when he used his eyes as input. There was no difference in performance between those who wore glasses and those who didn’t.

3.7 Gaze data

When looking at the recorded data from all the participants we saw different patterns. We could see that when the participant used the keyboard as input they focused mostly on the ball and the center of the screen and from the ball to the coins and back to the ball. On the other hand when using eyes as input they focused on the surrounding more than on the ball. They also needed to focus on what direction they wanted the ball to go. Some had more problems with this than others. A few of the participants looked from one side of the ball to the other. This was not good because the ball moved fast from side to side without reaching the coins.
Figure 10 The figure illustrates a gaze plot.

A gaze plot is a drawing of points on the screen that shows in what order the participant has looked on the screen. The order is represented by a number inside the point. The size of these points represents the pupil focus time.
Figure 11 The red dots on the screen show where participant 10 was looking.

In figure 11 the participant is using the Tobii T60 eye tracker as an input method. In figure 11 we can see two red dots, one small and one slightly bigger. The line between them shows the pupil transition. The size of these points represents the pupil focus time.
Figure 12 This figure is also from participant 10 and shows the pupil duration on a specific object.

The size of the red dot in figure 12 depends on how long the participant has gazed at the same point on the screen. In this case the participant has kept the eyes on the ball for quite a while.

3.7.1 Exceptions

A few of the participant didn’t play the game in the same way as the rest. Participant number four focused peripherally. He was also the one that got the lowest score using eye tracking as input.
**Figure 13** This figure shows the gaze data from participant 4.

There is no red dot because the person looked outside of the screen. When this happens the ball keeps rolling in the direction it was rolling in last frame. This occurs because the coordinates become invalid when the eye tracker does not find the pupils and since the game needs coordinates to move the ball this is the result.
3.6.2 Heat map

Figure 14 This heat map is from when using keyboard as input.

The heat map shows where on the screen the participant has looked most, in this case it’s in the upper right corner. You can tell by the red dot in the upper right corner, where the color is red that point on the screen has been looked on several times.
Figure 15  This figure shows a heat map from when the participant is using their eyes as input.

Compared to figure 14 the heat map in figure 15 is more intense. Since the participant is using the eye tracker as an input method s/he must control the ball with the eyes. This makes the participant look at the same spot/area on the screen more frequently.
3.8 Achieved feeling

![Bar chart showing feelings after the game ended]

Figure 16 The diagram shows how the participants answered the question “How did it feel when the game was over”. The figures to the left show the number of participants.

As you can see in figure 16, six persons choose to write a comment of their own. Two of them wrote that they wanted to play more.

3.9 Participants thoughts of eye tracking

In our questionnaire we added an open question: “What are your spontaneous thoughts about using eye tracker as an input?” We got all kinds of answers. Some wrote things regarding what they just experienced such as: “You have to gaze before the goal to reach it” or “It was hard to use”. One person thought it could be good for “disabled persons who can’t use normal input” but probably nothing for him. Some of the participants found it “Cool”, “Cool, but hard” or as one of the participant wrote: “vigorously, unusual would be exciting to use in a game”. One participant wrote: “It felt like the game was played by itself after a while, cool feeling”. Some of the participants wrote that you probably had to get used to using your eyes as input. For all comments see appendix 5.
4 Discussion

The following discussion contains different things that captured our interest like game issues, eye related issues and how the participants behaved during the time they played with the eye tracker. Some of the findings were more expected than others.

4.1 Game design issues and bugs

We noticed that sometimes coins spawned inside an obstacle and made it impossible to collect. This can affect the score since when we collect a coin a new one will spawn on the playing field and if one is untouchable a new one will not spawn. At the same time the place where a coin spawned was random and sometimes the player could get lucky and many coins spawned in the same area. This means that it is difficult to compare scores too much. It may give a misleading picture.

4.2 Experiment design

Another problem that appeared during the experiment was that one participant managed to quit the game instead of starting it when using eye tracking as input. This could have been avoided by placing the buttons further apart or making the start button larger. This resulted in a new calibration and we noticed that her score was much better when we made the calibration just before the second game. So calibrating just before the game starts that will use eye tracking is something to consider in the future.

4.3 Eye related issues

4.3.1 Glasses

Participants with glasses sometimes managed to pass the calibration test. Mat Zain et al stated that glasses and contact lenses was not a barrier for the eye tracker [15]. This was not the case in our research, participants with glasses managed sometimes to pass the calibration test. We noticed that a participant with the strength -4 on their glasses did not pass the calibration test but participants with less strength passed the test and was able to play the game wearing glasses.

4.3.2 Squinting

One participant was squinting and didn´t pass the calibration test. The participant was excluded from the study.
4.3.3 Blinking

The majority of the participants did blink during the tests. Blinking is a natural action that was expected to happen. It is hard to stare at a screen for 90 seconds without blinking but how does this affect the results? During each blink the eye lid is shut which covers the pupil and blocks the illuminator that is tracking the eye. This action will result in raw data for the X and Y coordinates which means that the X and Y coordinates are missing. During analysis there are fixation filters that can be applied to fix these missing X and Y coordinates [16]. In our game the ball continued to move in the direction the participant was looking before they blinked. With 60Hz and quit low game-play rate it won’t affect so much but if you play a fast paced game then it can become critical when you use the gaze as steering input.

4.3.4 Lack of input

One of our participants had small, deep-set eyes with dense eyelashes. We noticed that the eye tracker had some problems finding his pupils and tracking where he was gazing.

4.4 Head movement

During the tests some of the participants tended to move their heads while playing this might seem as an issue but according to the Tobii technology blog [17] this has very little impact on the gaze data because the Tobii eye tracker is composed of two cameras that captures an image of a person's eyes at a frequency of 60Hz or 120Hz. These two cameras produce images of the pupils simultaneously this provides the eye tracker with two different sources which offers a better calculation of the gaze point even if the head position changes.

![Figure 17](image1.png) This figure shows an illustration of the head movement box [16].
4.5 Correlation between perceived difficulty and score

A correlation test between the score and perceived score gives us the value 0.354954. This means that 12.6% (to get the effect of the value we use square on it) of the data from score can be explained with the data from perceived difficulty, saying that there is no significant correlation between a high score and low rated perceived difficulty nor the other way around. A person who thought it was hard to use their eyes as input could gain a high score and vice versa.

4.6 Answering the research questions

We found that the score was different depending on what input we use. It was harder to use eye tracking compared to keyboard and the score was lower when using eyes as input. On the other hand most of the players found that it was more fun to play with their eyes as input.

4.7 Missing data

Diagram 3 and 5 are one participant short. The reason is that the data from the questionnaire is missing on one person. We are not sure if something happened during the submission or if the data has been erased.

5 Conclusions

5.1 Fun

In the EU project, Fun of Gaming (FUGA), the Game Experience Questionnaire (GEQ) was developed [18]. The GEQ includes seven factors: (a) Imaginative and sensory immersion, (b) Competence, (c) Flow, (d) Tension, (e) Positive affect - fun & enjoyment, (f) Negative affect, and (g) Challenge/Suspense. We didn’t use GEQ in our study but we think that the questions we used includes most of the seven factors. We believe that our study shows that using an input device that is new to a person can enhance enjoyment. The participants found that using eyes as input was more fun than gaining a high score. In the close future there may be a market for the eye tracker if it comes in reasonable price range and if there is games that would be attractive with an eye tracker [1]. It is important to have ideas of how to use the technology together with games. For example, how fun would the Microsoft kinect™ be without a game connected to it?

5.2 Selecting participants

Maybe we could have been more selective when it comes to who to choose for our studies. Some of the participant didn’t play games as often as we wanted them to. This had no big
impact on the score but if we had looked closer on the gaze data we might have seen differences. Since only three of the participants played less than once a week we can’t say anything about it really, it’s too small amount of data.

5.3 Score

We noticed that a fast scanning gaze led to higher score. Some of the participants looked faster around the screen than the rest. Both of them gained higher score than average. We also noted that the most common case to play the game involved looking back at the ball. This led to trouble steering with the eyes as input and a lower score in most cases.

5.4 Experience with eye tracker

One of the participants had used an eye tracker before but only on pictures. It could be interesting to see what happens if the participants get time to practice using an eye tracker. Would they be able to gain a higher score? Would they be able to compete with their own score from using keyboard as input? At what point will they reach their peak?

6 Future work

6.1 Smart Agent

During the time we worked on this eye tracking project there occurred a discussion about a smart artificial intelligence. A thought was since the gaze information can be extracted it might be possible to teach an agent something from the gaze data it receives. For example where to look for players, areas of interest where another player might be, what part of the body to aim for when playing a shooting game.

6.2 Other types of games

6.2.1 Starcraft 2™

It would be interesting to see where on the screen an experienced Starcraft 2™ player looks when playing a game versus an equal opponent. Since we can find out so much by just using an eye tracker we can for example see what parts of the screen he focuses on most, how often s/he checks her/his minerals/gas and how often he looks at the mini-map. By recording this data we could probably see what makes you a better player.

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The mini-map is a very important thing to look at when playing to be able to spot drops or attacks. A unit health is essential to look at because in an engagement you sometimes need to pull back a damaged unit to increase your chances of coming out victorious in that battle. The minerals, gas and supply is always fundamental to observe because if you are supply blocked you can’t build units. The minerals and gas are important to keep low and always spend. If you have a lot of minerals you must notice it and create more buildings or units to keep it low.

6.2.2 RPG

It could be of interest to use eye tracking with other types of games and look at the experience when the participants try a RPG with eye tracking. Will the player feel more emphasized with the character that they are playing? How about other characters? What about teammates and opponents? Will the game experience feel any different if they use eye tracker when they orient themselves with their eyes. If you really look into someone else eyes will it affect how you act towards them in a game?

Figure 19 How would it feel to direct your eyes into this “boomkin” from World of Warcraft™?
7 References


Appendices

Appendix 1

This is a link to the questionnaire about the participants background:
https://docs.google.com/spreadsheet/viewform?formkey=dDd2dDR4TEIIXSHp0TDEyUTM0Z041SkE6MQ#gid=0

Appendix 2

This is a link to the questionnaire about how the participants experienced the game:
https://docs.google.com/spreadsheet/viewform?formkey=dHZCLWhzVm1MNWpSMWgxV3AxYjhUVE6MQ#gid=0

Appendix 3

This is the email that was sent to the respondents:

“Hej!

2 av studenterna i åk 3, Maria och Lorand, vill gärna ha testpersoner till sitt kandidatarbete. De har gjort ett spel i 3D som de behöver testpersoner till. Testpersonerna ska få testa spelet både med hjälp av normal input, mus och tangentbord, och med hjälp av eyetracking. De kommer även få svara på några frågor i samband med detta. Testerna kommer troligen äga rum någon gång mellan 25-28 april. Intresserade kan maila Maria Hagelbäck på maria.hagelback@gmail.com”

Appendix 4

Comments from the participants when playing the game using eye tracking as input

P = participant
01-n = participants number

P01*laughs*
P03*laughs*
P04*laughs* “Åh, vad svårt!”
"Det här var svårt" *laughs*

"Oah!" *laughs*

"Det var svårt."

"Nej, kom igen!"*laughs*

"Oj! Haha. Nej!" "Jag tittar överallt"

Appendix 5

The participants answers to the question “What are your spontaneous thoughts about using eye tracker as an input?”:

"Roligt och annorlunda, men kräver mycket övning. Man tittar gärna på pengarna vilket blir fel. Man vill också gärna vrida huvudet dit man vill att karaktären ska gå.”

"Jag tittade på tangentbordet när jag skulle "nedåt".""

"skulle vara häftigt i fps spel för att kolla runt med. Ser problem med att man inte kan kolla utan att "välja" just det området tillskillnad från musen då man kan röra den och om man vill "välja" så klickar man. T.ex råkade kolla på start en gång till utan att jag vill köra igen”

"cool, men svårt... Tror att kalibreringen skulle ha gjorts efter spell”

"En rolig ide men kan vara lite svårt, det är svårt att veta vart man skall fästa blicken och ibland så styr den åt ett håll även om man tittar dit för att veta vart man skall hänväst vilket gör att man kanske missar det mål man vill nå.”

"det var knepigt och skumt och man rörde mer på huvudet än ögonen tills man fick in knycket det var väl ingen av det som var roligare än det andra men blev mer trött o handen av tangenterna och fastnade lika mycket i båda fallen fast på olika sätt så båda spelsätten ger olika problem men det är ju det med att lösa problem i spel som gör det roligt så eyetrack var en lite större utmaning med ett egentligen lätt spel.”

"Det kändes som att det fanns begränsat antal steg (upp, ner, höger vänster), muspekaren uppdaterades inte så flytande efter mina ögon. Det krävs en annan typ av "kroppskontroll" hos spelaren, jag fick tänka på att inte röra huvudet, försöka slappna av och bara titta dit jag ville, metodiskt.”

"Man måste ha blicken framför målet man vill till”

"Kan funka med rätt tweakning”

"Den behöver vara lite bättre kalibrerad eftersom det var svårt att styra ordentligt och jag fick försöka kompensera genom att titta ute i extremerna för att få bollen att rulla som jag ville.
Jag tror även på eye-tracking som komplement till vanliga kontroller, inte en komplett ersättare.”

”Vad jobbigt att använda”

”det kräver en väldigt stor försiktighet med hur det implementeras, det kan lätt ge mer problem för spelaren än vad det ger tillbaka.”

”Den behöver bli känsligare för att fungera helt optimalt, men det finns möjligheter för det”

”förmodligen något man behöver träna upp eller vänja sig vid. Bra för att det sparar handen/armen.”

”Det kändes nästan som spelet spelades av sig självt efter ett tag, häftig känsla.”

”Intressant att få testa”

”Coolt, Lite svårt i början, men man vänjer sig. Kan räknas som en bra träning för ögon. :P”

”Det var häftigt, ovanligt och något som skulle vara spännande att ha i ett spel.”

”Det kommer nog framför allt att användas mycket mera i framtiden, Jag tycker absolut att det är något som man kan titta vidare på främst på Operativsystem men också inom vissa spel”

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”Säkert bra för handikappade som ej kan spela med vanlig input. Nog ingenting för mig.”

”Om man kan röra huvudet samtidigt så, kan det vara bra”