Custom-Made Interfaces Assessment
VR Game Experience for the Visually Impaired

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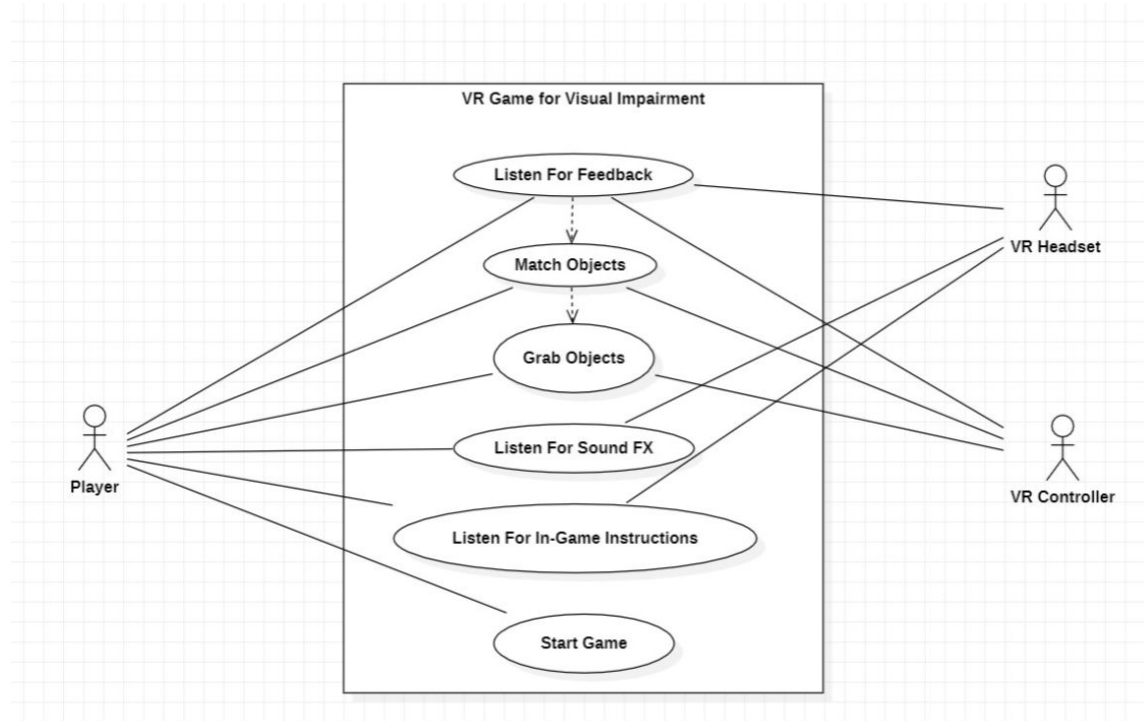Matthew McPherson - 1007575379

Use Case description

Actor:

    Player

System:

    Vr Game

Goal:

    Locate and Match Blocks using only audio and haptics

VR Game for Visual Impairment

Listen For Feedback

Match Objects

Grab Objects

Listen For Sound FX

Listen For In-Game Instructions

Start Game

Player

VR Headset

VR Controller

Synthesis and analysis of the SUS Questionnaires
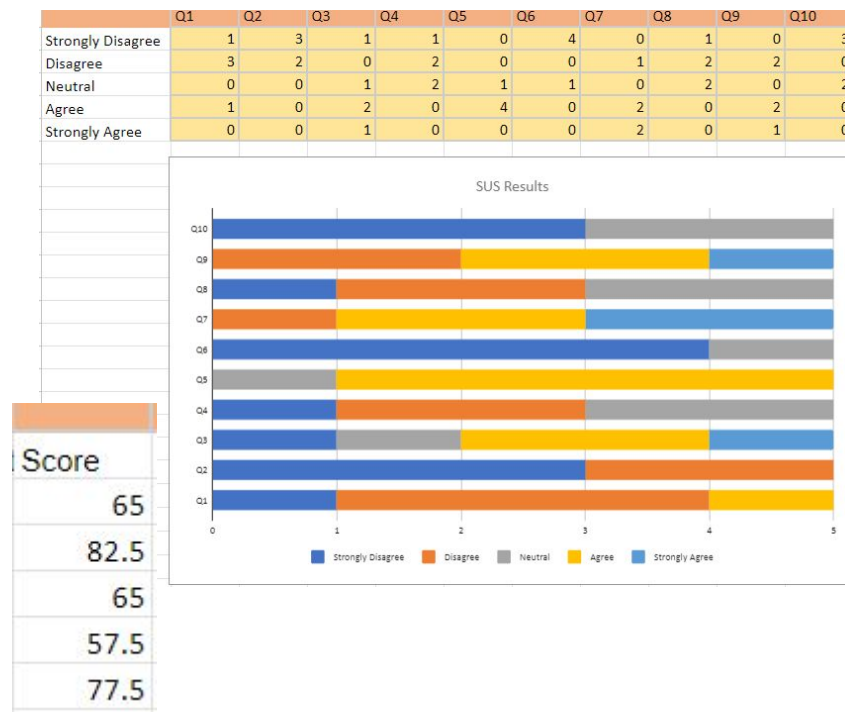
System Usability Scale:

10 Questionnaire

5 Participants

Considered 68 Average

- 3 Scored Below Average
- 2 were close

Results

- Some usability issues needs to be tweaked.
- Need to help player understand instructions easier.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Strongly Disagree	1	3	1	1	0	4	0	1	0	3
Disagree	3	2	0	2	0	0	1	2	2	0
Neutral	0	0	1	2	1	1	0	2	0	2
Agree	1	0	2	0	4	0	2	0	2	0
Strongly Agree	0	0	1	0	0	0	2	0	1	0

Score
65
82.5
65
57.5
77.5

Synthesis and analysis of the Presence Questionnaires

Presence Questionnaire

19/24 questions used

5 participants

Results

- High Realism
- Low self-evaluation of performance

	Mean
Realism	28.6
Possibility to Act	20.2
Quality of interface	11.4
Posibility to examine	16.2
Self-evaluation of performance	10.4

	Ehren	Chris	Cydney	Jin	Nick
Realism	32	35	28	24	24
Possibility to Act	22	18	19	14	28
Quality of interface	8	11	10	14	14
Posibility to examine	15	19	14	14	19
Self-evaluation of performance	11	14	8	8	11

Q1; Q5	Q2; Q6	Q3; Q7	Q4; Q8	Q5; Q9	Q6; Q10	Q7; Q11	Q8; Q12	Q9; Q13	Q10; Q14	Q11; Q15	Q12; Q16	Q13; Q17	Q14; Q18	Q15; Q19	Q16; Q20	Q17; Q21	Q18; Q22	Q19; Q23
6	5	8	0	4	5	5	6	5	5	7	2	5	5	6	5	1	2	6
5	7	6	4	5	4	5	5	1	4	7	7	7	7	7	7	1	3	5
5	5	4	5	2	5	4	6	3	2	5	4	6	6	5	3	1	3	5
2	5	4	6	2	1	3	6	1	2	5	3	6	5	5	3	4	5	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	5	1	6	5

Synthesis and analysis of the NASA TLX Questionnaires

- Low-decent amount of mental demand
- Very little physical demand
- Virtually no feeling of being rushed
- High level of success
- Decent amount of effort put in
- Varying amounts of frustration

Raw Data	M	Ph	T	Pe	E	F
Testers	Q1	Q2	Q3	Q4	Q5	Q6
1	3	2	1	8	5	2
2	3	1	1	10	4	3
3	7	3	1	10	6	7
4	5	3	3	4	8	8
5	5	6	1	10	7	1

	1	2	3	4	5
Mental Demand	3	3	4	3	1
Physical Demand	1	0	0	0	2
Temporal Demand	0	0	0	0	1
Performance	5	5	5	3	5
Effort	5	5	3	5	5
Frustration	2	3	4	5	1

Weighted Data	M	Ph	T	Pe	E	F
Testers	Q1	Q2	Q3	Q4	Q5	Q6
1	9	2	0	40	25	4
2	9	0	0	50	20	9
3	28	0	0	50	18	28
4	15	0	0	12	40	40
5	5	12	1	50	35	1

Feedback and Limitation

Feedback	In Scope or Out of Scope
Good game honestly great not as good as metroid prime though being serious no complaints it worked really well	N/A :(
Maybe, if the view was extremely dark all over, the block box did distract a lot. I could not move to the next block, therefore i had to throw the other block.	In Scope
I got so distracted with locating the audio that I forgot to move. I did not know when I grabbed one of the objects and if I drop it. The game ended and I had no idea what I did what happened. I think the audio choices were on spot, a bit louder for my taste. the lack of visual feedback was disorienting but exciting as a problem solving opportunity. I'd prefer having feedback confirming that I grabbed the objects and merged them.	In Scope

Feedback	In Scope or Out of Scope
The controllers were vibrating after I had picked up the cube which threw me off. I think that you need to stop the cube you picked up from causing any more vibration in the controller.	In-Scope
- The vibration when an object is grabbable lasts way too long. I touched my hand controller to it and it vibrated long after i stopped making contact with it. - The box i'm grabbing won't shut up and i can't figure out which sound was the one i grabbed and the one in the environment. In fact, because of proximity, the one i grabbed was often louder. -The box fell through the floor and i simply could not reach it - I needed to physically sit forward from my chair or else I couldn't reach the red boxes	In-Scope

Takeaways and Future Work

- Usability issues
- Audio level is important
- Audio is easily distracting
- Issues with Haptics
- Needs better feedback
- Overall Good
- Interesting without visuals

- Audio feedback iteration
  - Adjust sound levels
  - Stop playing audio when grabbed
- Haptic feedback iteration
  - Adjust levels when grabbing
  - Adjust vibration time
- Game design iteration
  - Adjust in game instructions
  - Block size and placement

The End