Project Outline

Group No: SSD13
Topic: Colour Blindness Detection using AFrame

1. Problem statement

To implement color blindness tests from the established literature[1] as a web-application based on AFrame to digitally test color-blindness in users. The users will also be classified as per the type of colour blindness.

2. Solution Approach

There are three different types of colour blindness: Protanopia, Deuteranopia and Tritanopia[2]. The task is to create an AFrame website that distinguishes the user with normal vision and colour blindness. It will also notify the user about the type of colour blindness he is suffering from.

The approach is to create a game in which there is a maze, whose walls are in different colours, corresponding to the colour palette for different abnormalities[3]. The instructions for the user will be given at the start of the game. The goal is to go through the maze. The user can go left or right on the basis of the way he is able to perceive the colors. Example: If he is able to distinguish between the colours, then he has to go left. Else, he has to go right. As the game proceeds, the instructions will be provided to the user for every step.

The maze will be designed in such a way that at the end of the maze, the user will get the result of if he is detected with colour blindness or he has normal vision. If he has colour blindness, the type will also be specified.

We have chosen this approach because it pinpoints the exact vision abnormality. Colour blindness is a spectrum and not a binary condition[2]. Our project aims to diagnose the defect accurately. We chose the approach of maze-game because it can easily be played and is very interactive. Using the maze, we can cover all kinds of colour blindness and arrive at a proper conclusion.

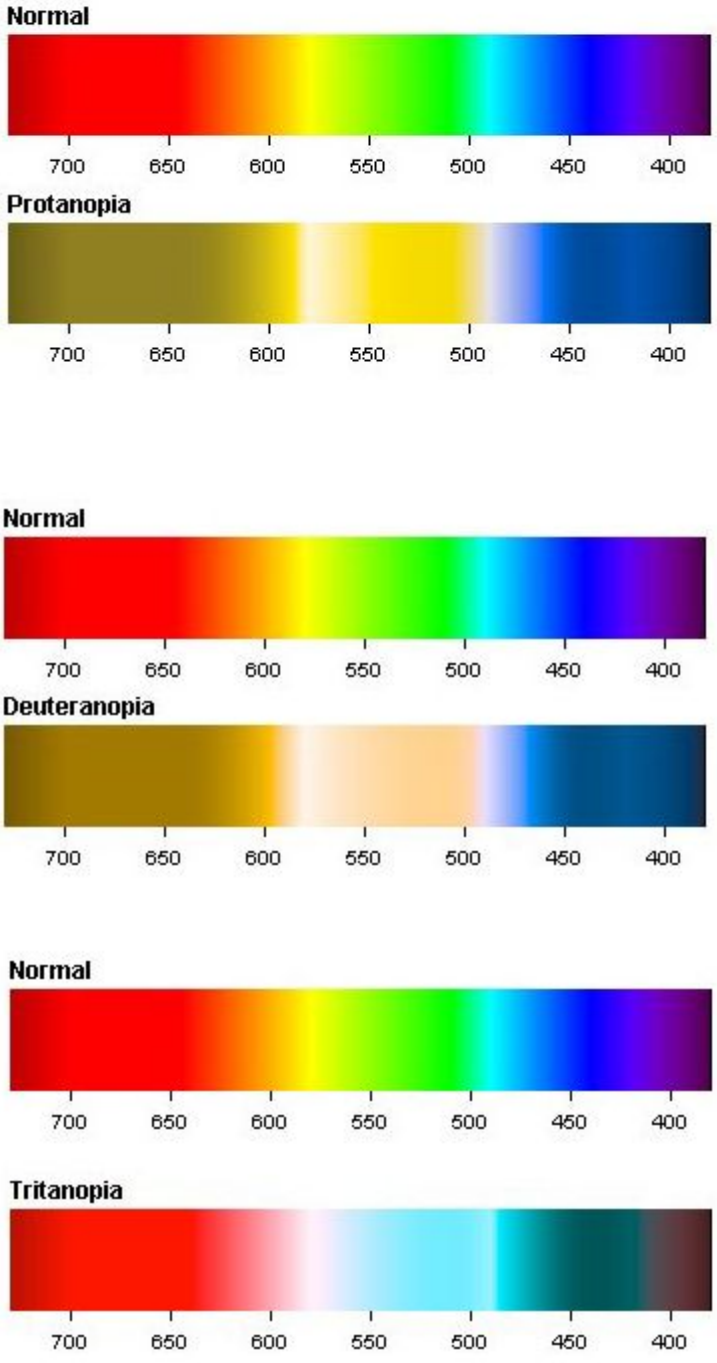

Fig: Colour vision of colour blind people[4]

3. System Requirements

3.1. Web Technologies

- HTML/JavaScript

- AFrame framework

3.2. Must be run on the browser which supports WebGL and WebVR.

4. Timeline

Work division:

1. Protanopia maze + monochromacy maze: Devershi Chandra and Sai Sirisha N
2. Deuteranopia maze + Tritanopia maze: Pawan Patidar and Vishal Patel
3. Integration: All members

Please refer to the next page for the timeline.

5. References

[1] https://www.colorlitelens.com/color-blindness-test.html
[2] https://www.color-blindness.com/types-of-color-blindness/
[3] Maciej Laskowski, Using 2D and 3D Computer Gamesto Detect Colorblindness –a Comparative Study
[4] https://venngage.com/blog/color-blind-friendly-palette/
[5] https://www.color-blindness.com/coblis-color-blindness-simulator/

GANTT CHART

PROJECT TITLE	Colour blindness detection using AFrame	GROUP	SSD13

WBS NUMBER	TASK TITLE	START DATE	END DATE	DURATION	PCT OF TASK COMPLETE
1	**Project Conception and Initiation**				
1.1	Basic knowledge of AFrame	10/1/20	10/6/20	5	100%
1.2	Research about colour blindness	10/6/20	10/9/20	3	90%
1.3	Requirements finalization and discussion	10/9/20	10/12/20	3	100%
1.3	Project Outline Delivery	10/13/20	10/13/20	0	100%
2	**Project Definition and Planning**				
2.1	Scope and Goal Setting	10/13/20	10/15/20	2	50%
2.2	Design finalization	10/16/20	10/17/20	1	0%
3	**Project Development**				
3.1	Create base model	10/18/20	10/28/20	10	0%
3.2	First stage of evaluation	10/29/20	10/29/20	0	0%
3.3	Project Updates	10/29/20	11/2/20	3	0%
3.5	Testing features	11/2/20	11/8/20	6	0%
4	**Project Delivery**				
4.1	Project delivery	11/9/20	11/11/20	2	0%