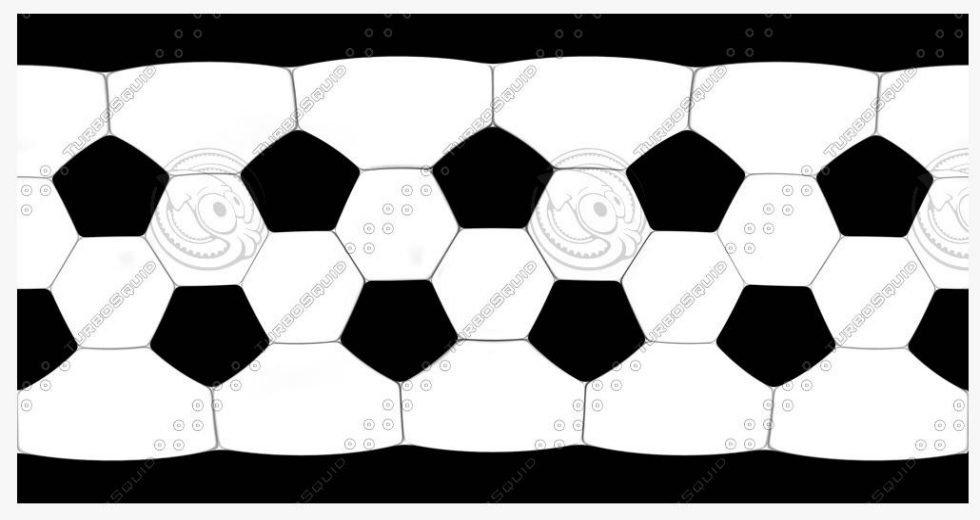
Assignment- 4

Ajay Chhajed (IMT2019006)
Amitha Reddy (IMT2019023)
Vismaya Solanki (IMT2019095)

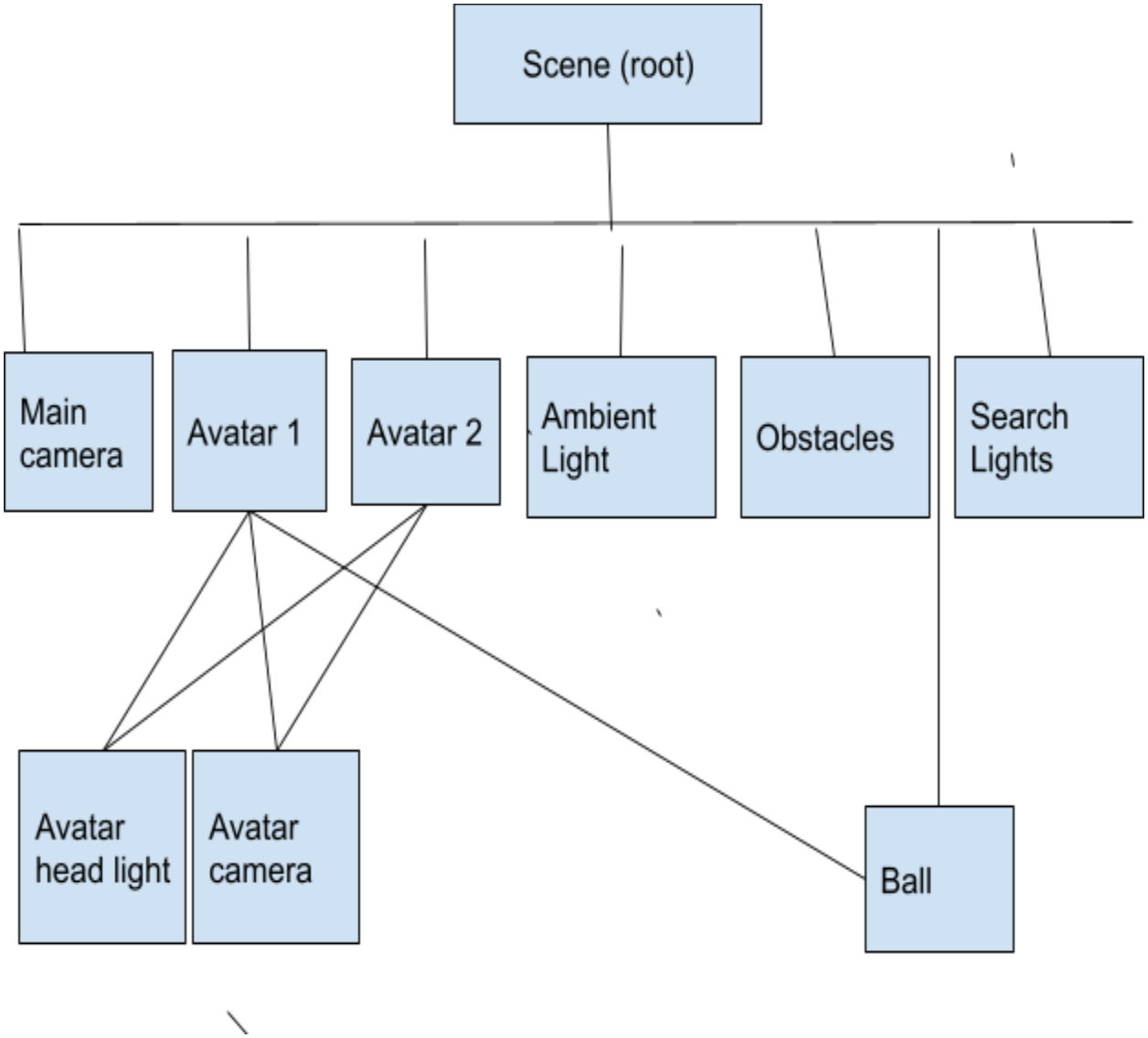
1. What kind of distortions do you notice with the texture maps you have used? What would be your approach to correcting them?

   If we use a rectangular football map we observe distortions where the pentagons(black) gets overlapped at top and bottom by using planar or rectangular mapping.
   To overcome this we use surface parametrized spherical map of ball which is already implemented in the threejs libraries.



2. Provide a brief writeup (1-2 pages) on the design you used for:
   a. scene graph organization,
   b. how the position and orientation of lights and the avatar's camera are calculated,
   c. computation of animation including collision detection/avoidance.

a. Scene graph organization



b).

Lightings : There are different types of lights used here.
We used ambient light which is the child of scene. It just adds lighting to whole environment.
We added streetlights around the stadium and made them point light sources focusing towards inside of the ground.
We used spotlights for both the players and they are child of scene.
All the lights can be turned on/off and the intensity of street lights can be changed.

Cameras : There are two types of perspective cameras : main view and avatarCamera. The main camera is child of scene and avatarCamera is child of

avatar. Making avatarCamera child of avatar, eases the calculations for us. The camera will stay attached to the avatar and move along with it.

C).

Animation :

We used adobe Mixamo to take the avatars and take their walking animation using fbx files.

In the carry mode the rotation of ball is turned off, it rotates in dribble mode and kick mode.

When the ball is in carry mode, it will be child of player and otherwise it will be child of scene.

Collisions :

We tried using intersectsBox method of bounding box to detect collisions but it did not give satisfactory results so we had to use mathematical forms by calculating the distance if that falls under the threshold then collision is declared.

When the ball is in carry mode and avatar collides any of the obstacle, the ball will be return back and no longer remain under carry mode of the player.

If the ball crosses the goal post then the game restarts.

Demo Video link: CG-A4.mov

References :

- https://r105.threejsfundamentals.org/threejs/lessons/threejs-scenegraph.html
- https://threejs.org/docs/#manual/en/introduction/Animation-system
- https://github.com/tamani-coding/threejs-texture-maps
- https://www.youtube.com/watch?v=pUgWfqWZWmM
- https://cs.wellesley.edu/~cs307/threejs/mrdoob-three.js-d3cb4e7/docs/