Automagic's Augmented Reality

Computer Graphics: Rendering- fall 2023

Coursework 1 Report

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The Scene

I. Plan and construct your scene carefully, taking measurements if necessary:

- Starting from this stage, every single object in the scene was measured accurately in order to make my life easier while working on blender, ex: the size of the can, the direction where the light is coming from, the intensity of shadows and its direction and etc..

II. Take a photograph of the scene:

- This part was a bit tricky: I started to think in this part by choosing a theme for my blendered photo. As an egyptian I thought of making my theme with pharoah textures and models; that is why there is a papyrus paper in the background, and my model was the sphinx in order to make it related to the theme. Also, in order to make the ground of the image related to the pharoach scene, I chose the floor to be my ground because it a little bit related to the scene.

III. Estimate camera position and parameters relative to the scene

- In the real world: That was one of the hardest parts in the course work, and it took from me much time to adjust the camera position so that it did not move while taking to pictures for the scene, one with out the reference for the AR object and one without it.
- In Blender: In order to adjust the camera position, I needed to use fspy where it helped me to determine the central axis for my image, and also determined the principle point where I took the image from. After uploading the fspy camera to blender, It was so easy to model the 3d objects on the original image.
- We know that the camera fspy will not appear at the end in the rendered image, so I uploaded the original image as plane and located it with the same dimensions for the fspy camera.

IV.   approximately estimate and model lighting in the scene

- In the real world: I tried to measure the distance (length, width, and height) between the spot light and the position of the scene.
- In Blender: I put the locations specs that I measured in the real world in the location space for the light in blender, and after that I started to increase or decrease the strength of the light based on the range and intensity of the shadow in the original image.

V.   replicate crucial players virtually by modelling them (geometry and texture):

- That was not a big problem because I wanted to do this only with the coca-cola can, so I got the model for it online, and I started to adjust the shadows for it, and at the end I did a UV mapping in

order to make the can texture be the same as the one in the original image to be more realistic.

- Also, adjusting the can model on the can iside the image was a bit hard because you need to be precise with its size in order to get correct shadows at the end.

VI.   render virtual scene using steps 3, 4 and 5:

- All the time, I was splitting my screen into two views, one for the model viewport, and the other for the rendering viewport, and that made my life easier in applying steps 3,4, and 5

The Animation Video

Choosing the animation video was a bit hard for me because I wanted to choose a scene that has a non-trivial physics in it, so, I chose the basketball scene as it has different physics in it, like collision, Rigid bodies, projectiles, and material physics (cloth).

4:   References

Coca-Cola can model:
> https://www.modelplusmodel.com/accessories/food/935-coca-cola.html

Sphinx model:
> https://sketchfab.com/3d-models/old-kingdom-sphinx-ebd496a7e5364af1b32674389a38dffb

Baksetball tutorial:
> https://www.youtube.com/watch?v=baYiyevNT6Q

Basketball court Model:
> https://sketchfab.com/3d-models/basketball-court-77af6cb6181e4fe7b56bf15035b33422

Basketball Model:
> https://www.turbosquid.com/3d-models/3d-model-basketball-1799630