COSC422: Assignment 1

Report

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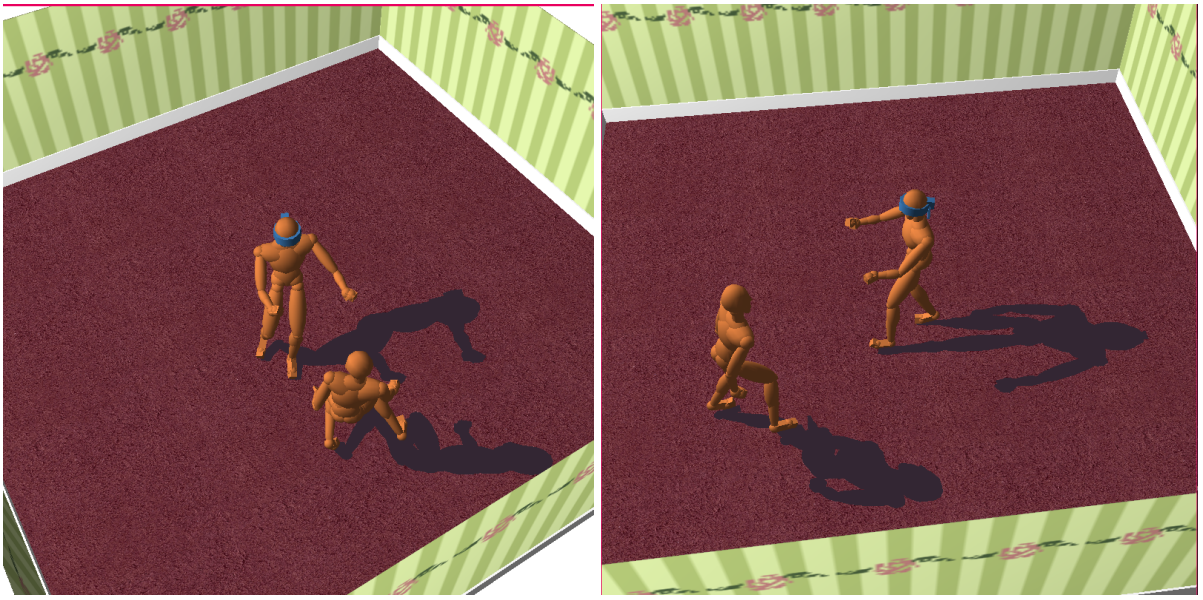
Skeletal Animation

Description.

The scene shows two skeleton character models playing Blind Man's Buff, where one character is blindfolded and attempting to tag the second character. Images of the scene are shown in Figures 1 and 2. Both skeletons are modelled the same way, using the same functions to create the limbs and bodies. One model has a blue blindfold added to it. The animation shows the blindfolded model chasing the other model, who dodges and ducks out of the way. When the animation finishes, it restarts from the beginning, although the loop is not seamless. The animation data used for this animation was from the Carnegie Mellon University's motion capture dataset [1].

The scene is set in a room, with a red carpeted floor and green striped walls. The carpet and wall textures were sourced from OpenGameArt.org [2], [3]. The camera shows a view from above the scene at an angle and slowly rotates around the centre of the scene.



Figures 1 and 2: images of the skeletal animation scene

Skeleton models.

The models for the animated characters were created using glut solid objects that were scaled and rotated into place. Most of the model was made up of spheres that were scaled to resemble human anatomy. The size and position of the skeleton parts were generated using the offset value of the next joint in the chain. These offsets were taken from the animation file and written as constants so that they could be used. Each model used a different set of offsets that matched their animation file. The names of joint nodes were used to decide which function was used at that joint. The same functions were used to generate both models, except for an extra function that was used to generate the blindfold on one of the models. Joints of the models were connected using spheres to prevent any gaps showing when the models move.

Two Models
The second character was added to the scene by importing both the animation data files and calling the recursive render function once for each character. The characters were numbered which was used to make sure the matching joint offset values were used and that only one of the two models had a blindfold.

Planar Shadows.
Planar shadows were created for the two models by rendering each model a second time with a shadow colour and applying a shadow projection matrix.

Character Animation
The character animation shows the animation of the dwarf model given in the lab material. The animation used was the animation that came with the dwarf model, where the dwarf goes down on a knee, stands up, and looks around. When the animation has completed, it restarts from the beginning. This scene is shown in Figure 3.

Figure 3: Character animation scene

References.
[1] Animation files “20_13.bvh” and “21_13.bvh” are from the Carnegie Mellon University’s motion capture dataset. Accessed from https://sites.google.com/a/cgspeed.com/cgspeed/motion-capture on 21/08/2023.
[2] Texture file “RedCarpet_S.bmp” by user Keith333 on OpenGameArt.org. Accessed from https://opengameart.org/content/carpet-texture-red-seamless-texture-with-normalmap on 28/08/2023.
[3] Texture file “wallpaper.bmp” by user Santoniche on OpenGameArt.org. Accessed from https://opengameart.org/content/wallpaper on 28/08/2023.