Assignment 1:
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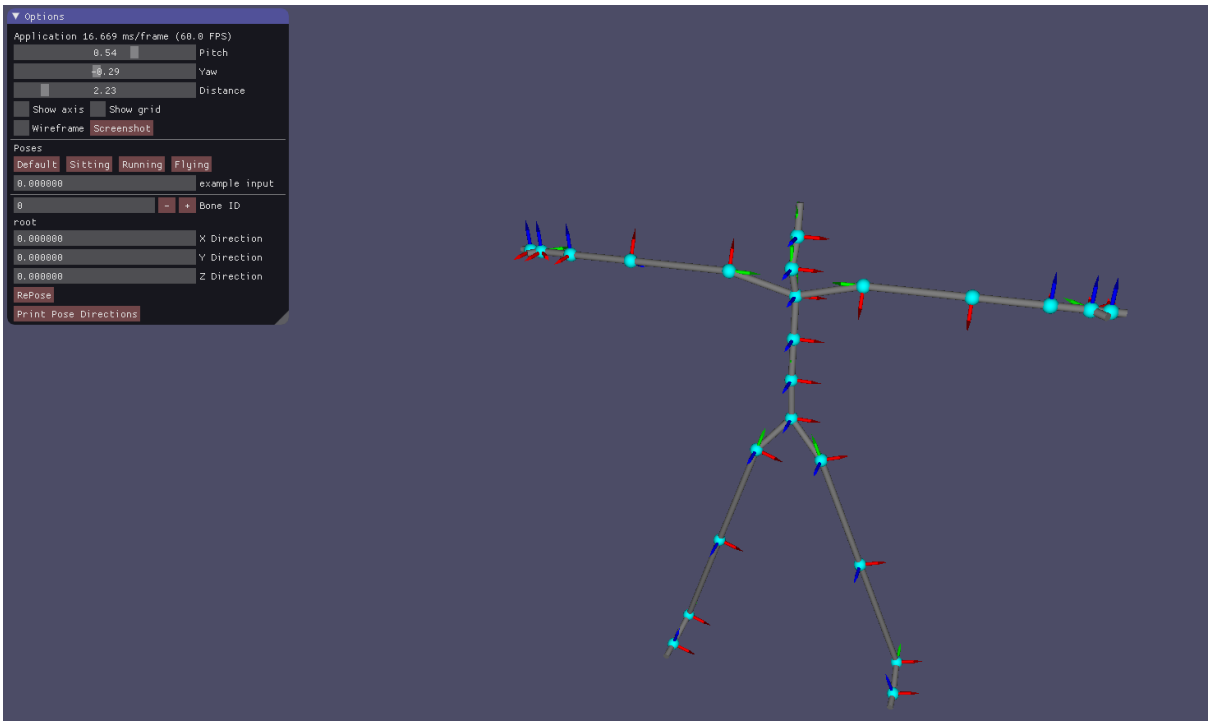
How to Run:
To run the program, ensure that in the res folder, there are the following files “sitting.asf”, “running.asf” and “flying.asf” aswell as the default priman.asf provided. On loading the program it will open priman.asf, different poses can be selected using the ImGui Controls. Also make sure that in the same directory there are the files ‘walking_priman.amc’,’breakdance_priman.amc’, ‘interaction_s1_priman.amc’ and ‘interaction_s2_priman.amc’.

Drawing ASF File:
Inorder to draw the bones, joints and axies of a skeleton, It first draws the joints after scaling them to a reasonable size. It then will rotate the bone to point towards the given direction, it will then scale the bones to the proper length. This is using a different transformation to the joint, so the bones scaling is independent. Finally we draw the rotated axies. To do this, we rotate the axies based on the asf data and then rotate the axies by 90 degrees to get them pointing in the correct place, e.g Y points up if it doesn’t have any basis rotation.

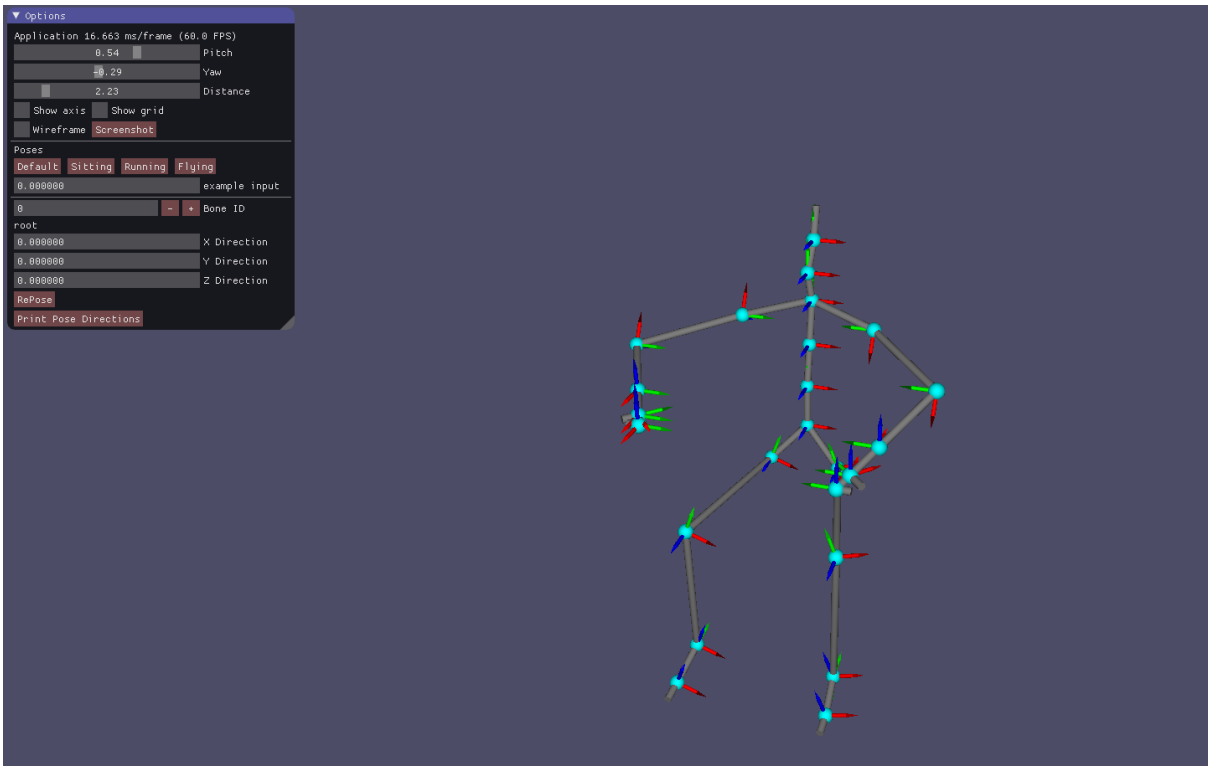
Posing:
Using the ImGui controls, the user can load in a preposed skeleton, where the poses are sitting, running or flying. There are also built in ImGui controls, letting the user repose a skeleton on the go. The user can move between different boneIDs and from there edit the direction of the bone. By hitting the repose button the bone direction will be updated.

Animation:
After reading an AMC file, we are able to animate a character by rotating the skeleton’s bones according to the file. To do this, we must calculate an inverse transformation, which we can use to properly apply the rotations to, and avoid deformations from applying transformations out of order. We also increase the skeleton’s poseId every time that the scene is rendered. By creating two skeletons, we are able to load them with different amc files and let the animations ‘interact’ with each other. This can be demonstrated from the ‘interaction’ button. ImGui buttons are also implemented to allow the user to switch between animations and set poses. Note that whenever a new animation is selected the current pose will be reset.

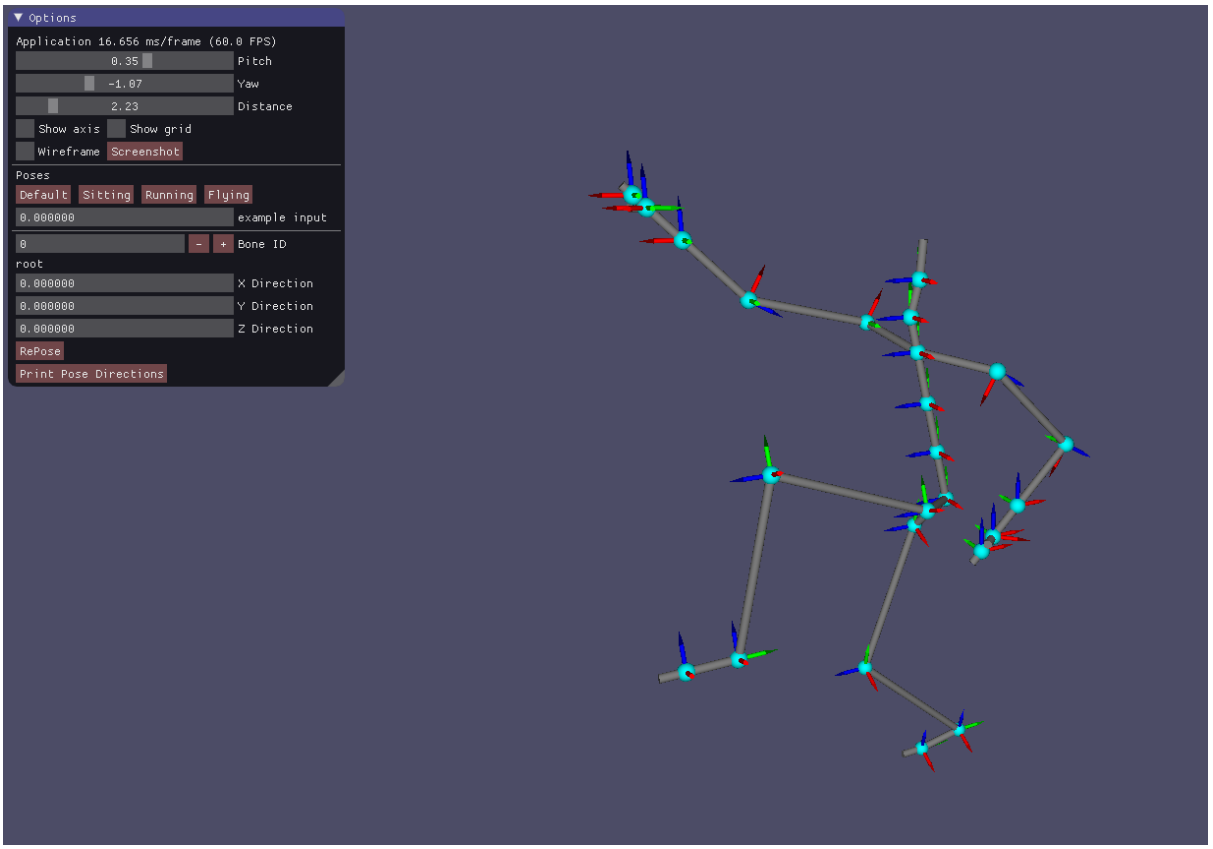
Default Priman Pose



Sitting Pose



Running Pose



Flying Pose: