Fall 2016: ELG5124/CSI5151
Assignment 3

Due: Tuesday, November 8th, 2016, 11:00pm in Virtual Campus
University of Ottawa - Université d'Ottawa

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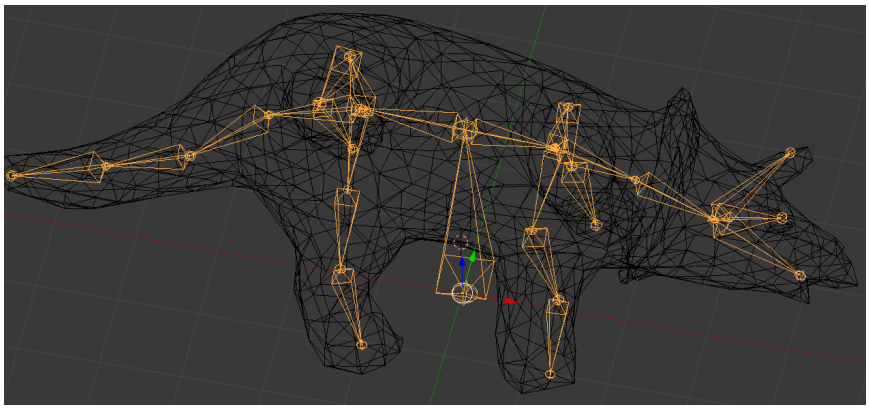

Figure 1: Rigged Triceratops Model with Skeleton in Blender

1 Character Animation

This assignment will give you a chance to familiarize yourself with keyframe-based character animation. You will be using Blender and use the animation in the JMonkey engine to animate the triceratops dinosaur.

1.1 Getting Started

This assignment will require you to use *Blender*, a widely used open-sourcemodelling tool that is installed with *JMonkey 3.0* (`http://www.jmonkeyengine.org/`). The process of character animation is:

1. **Rigging:** The process of defining links for kinematic chains used for the character. This is often referred to as creating a skeleton with bones and joints.
2. **Skinning:** The process of associating parts of the 3D mesh with the bones of your model.
3. **Keyframing:** Arranging the skeleton along with the mesh of your model in certain poses that make up a portion of the frames of the animation.

For these three steps, we will use *Blender*. These three steps are also indepedent from the way the animations are to be played back (e.g., in Unity, Unreal or JMonekeyEngine). In order to get started using *Blender*, it is strongly suggested that you watch the following tutorial videos:

1. dillongootoo, "How to rig anything in Blender?",
   https://www.youtube.com/watch?v=eF4CuIX40XE

2. CGMasters, "Bow and Arrow Rigging in Blender",
   https://www.youtube.com/watch?v=jpsd0Aw1qvA

The *JMonkeyEngine 3* beginner's tutorial 7 *Hello Animation* will show you how to use keyframe animations in JMonkey and the *documentation for advanced users* provides information on *Creating jME3 compatible 3D models in Blender*.

1.2 Character Rigging [3]

Create a skeleton for the triceratops dinosaur supplied with this assignment. Note this is the same dinosaur then for Assignment 1 but the mesh is centered at the origin. Your skeleton must contain bones for the legs of the dinosaur, the tail and the head with its horns.

1.3 Skinning the Character [1]

Skin the skeleton from Section 1.2 with the supplied mesh. This process is largely automated in *Blender* but make sure that the result looks reasonable and is compatible with the *jmonkeyengine*.

1.4 Keyframe Animation [4]

Now define some keyframe animations with the non-linear editor in *Blender*.You are required to define three separate sequences: One animation for walking where all 4 legs move. The motion should be cyclical, i.e., if the animation is played continously, it should look like your character continues to walk. Another animation for tail wagging from side-to-side. Again make sure that this motion is cyclical. Finally a roar with the dinosaur's head which is not cyclical. Verify in *Blender* that all the animations are ok.

1.5 Loading the Animation in JmonkeyEngine [3]

This part is essentially the same than the beginner's tutorial *7 Hello Animation* but we use three keys: 'r','t', and 'h'. The key 'h' has to trigger a one time head roar. The key 'r' is for running but it should trigger a continously playing the run/walk which should only stop if the key is pressed again. Finally, the key 't' should behave like 'r' key but turn on the tail wagging.

2 Submission

You will need to submit your solution (only the source directory and your assets directory including all blend files along with the `*.xml` project files but no other files) to BB learn by the deadline. No late submissions are allowed, you can submit multiple times but only your last submission is marked.