Fall 2017: ELG5124/CSI5151
Assignment 3
Due: Tuesday, November 7th, 2017, 11:00pm in Virtual Campus
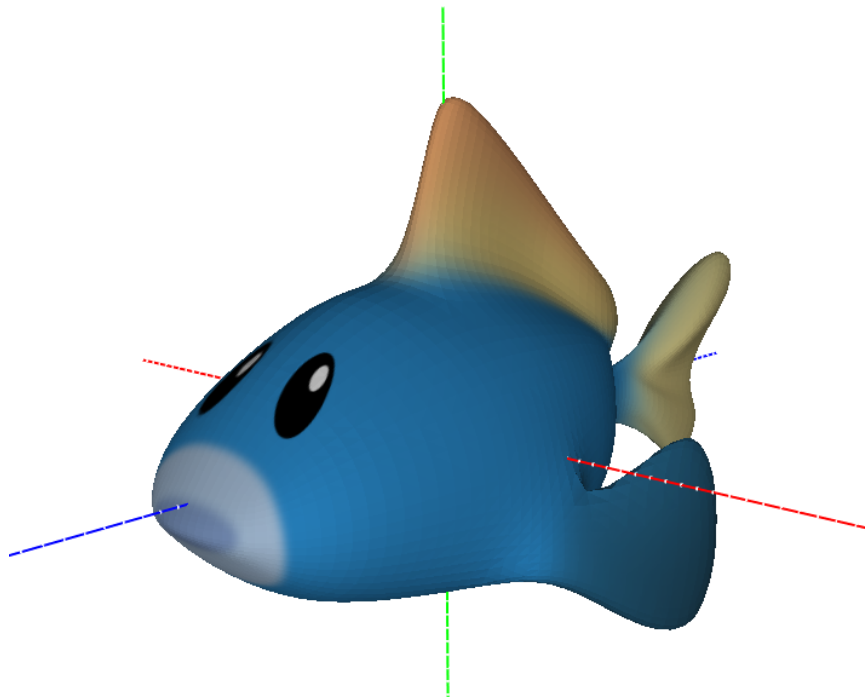### University of Ottawa - Université d'Ottawa

Jochen Lang

Figure 1: Blub Model

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 model of the fish blub[1].

1.1 Getting Started

This assignment will require you to use *Blender*, a widely used open-sourcemodelling tool that is installed with *JMonkey 3.1* (`http://www.jmonkeyengine.org/`). The process of character animation is:

---

[1]Blub was created by Kenan Crane, CMU. 3D model is in the public domain.

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 blub supplied with this assignment. Note that the mesh is centered at the origin. Your skeleton must contain bones for the head, body, fins and the tail of the fish.

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 swimming forward where the caudal fin (at the tail) and the body wiggle side-to-side. The motion should be cyclical, i.e., if the animation is played continously, it should look like your character continues to swim forward. Another animation for the fish being stationary. The stationary idle animation should entail the pectoral (side) fins and the dorsal (top) fins wagging, wiggling from side-to-side. Again make sure that this motion is cyclical. Finally a 180 degree turn animation with the fish using its fins and bends its body to turn 180 degrees. This animation 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: 's','i', and 't'. The key 't' has to trigger a one time 360 degree bending turn. The key 's' is for swimming but it should trigger a continously playing the swim which should only stop if the key is pressed again. Finally, the key 'i' should behave like 's' key but make the fish idle stationary.

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.