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CIS 410 Graphics Programming in Python

Assignment 5: Deformers

Report

I.What are the benefits/disadvantages of each? (When use one deformer over another?)

A. blend shapes

blend shapes is a good tool for adjusting objects. Once a target model is created, we can use the blend shapes tool to form any objects between the original object and the target object. That means we can create thousands of different objects in a short time. However, we need a target object first, and this target object can not be a different shape from the original object which is hard to create.

B. cluster deformers

Cluster deformers let you control a set of an object's points (CVs, vertices, or lattice points) with varying amounts of influence.

C**. texture deformers**

In the texture deformers, we can use any models that we already created on a new object. which is convenient, also we can adjust how much we want the original object similar to the target object using the slide bar as the blend deformers do, which is very good for deforming. Because the texture will be duplicated on the object, this deformer will be a good tool to shape the ground or environment.

D. wire deformers

Wire deformers are like the armatures used by sculptors to shape objects. With a wire deformer, we use one or more NURBS curves to change the shape of objects.

E. wrap (and lattice) deformers

Wrap deformers let you deform objects with NURBS surfaces, NURBS curves, or polygonal surfaces (meshes).With wrap deformers, you can shape deformable objects with NURBS or polygonal objects. The shapes of the NURBS or polygonal objects you use provide the shapes of the deformation.

F. muscle deformers

This is a skin deformer that lets you rig characters with underlying muscle objects to create realistic skin deformation. You can also use Muscle's independent Displacement, Force, Jiggle, Relax, Smooth, and Collision features to create other deformation effects. Any NURBS surface in Maya can be converted to include a Muscle Object shape node and be connected to the Maya Muscle skin deformer.

G. point on curve deformers

This is useful for deforming individual curves at specific points along the curves. By moving (translating) the locators you can change the shape of the curve without being limited to being able to move only the curve's CVs. Also, when modeling, you can use point on curve locator constraints to connect two or more curves together so that they intersect.

H. influence objects

We can create an object and use it to influence the shape of smooth skin. The object, called an influence object, acts like a surgical implant against which the skin deforms. For example, you can create a sphere and use it to simulate a muscle or bone that bulges as you pose the character in certain positions. You can also use

an influence object to smooth deformation and maintain volume in regions that collapse while bending.

II.There is benefit in using them in combination (e.g., in series and parallel, or globally versus locally, etc.). How does one combine them and get them to 'play nice'?

muscle deformers and influence objects:

muscle deformer is for building muscles using the joint bones, and influence objects will need a skin to operate, which also need bones to create. Combining these two tools we can create any muscles and skins on a creature.

texture deformers and wire deformers:

Texture deformers is good for creating ground environment and geometry elements, which is already a strong tool. However, the texture will be repeated and the everywhere is all the same. As long as we combined the texture deformers to the wire deformers, everything will be different. We can create mountains, basins and cliffs with the texture, which means easy to create but good quality.

III.What are the 'best practices' used by the facial animation community for using deformers to model faces and expressions?

for example:

when we used "muscle deformers" to create a bone object and use it to influence the shape of smooth skin, we found that "muscle deformers" is very smart to to simulate an elbow jutting out as people's arm bends. Also, blend shape will be a good tool to adjust faces that we created. As long as we completed two target faces, we can created thousands of faces betweens them, which will be an easy way to build.