Practices Virtual Environments

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Chapter 3

Scene graph

The aim of this practice is to learn to create graphs scene in Blender

3.1. Introduction

To create a scene graph must make objects from lower levels depend on those of the upper levels.

The relationship between objects is set with the function Object> *Parent* > *Object,* which will create a popup for confirming the action. To set the unit must have previously selected the two objects (first father son and then pressing Shift).

The graph structure can be seen in the window *Outliner*. Mis ma in that window can double-click the node names and change them.

Create a cube and a cylinder, the cylinder beam is the father of the cube. Try to transform the cylinder and cube (see Figure one).

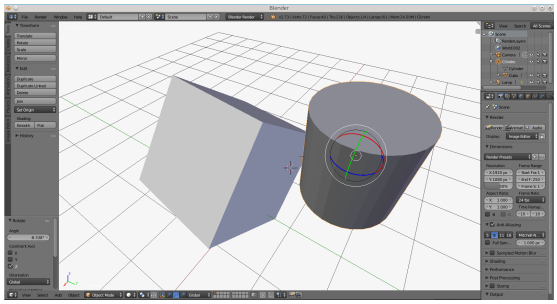

Figure 1: Two objects with hierarchical relationship

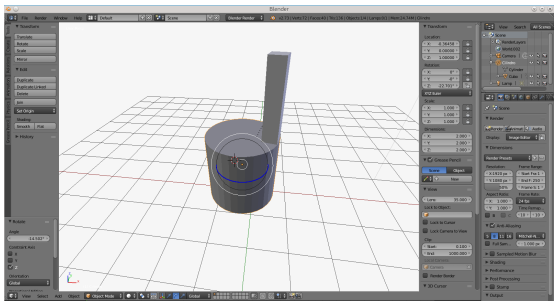

Figure 2: by modifying transformations

3.2. transformations

The transformation applied to each object can view and edit the tab transformations that unfolds to the right of the 3D view.

This tab can block some transformations using the given can- with parameters.

Amends the transformations of the cube to place it on the cylinder and make it thinner. Blocking **all transformations except ro- tation Z cylinder and translation in X cube (see Figure two). Try to** transform the two objects with 3D manipulators win- dow.

At the bottom of the transformations tab you can change the way the changes are applied (whether in the local or global system coordinates).

3.3. Origin and cursor

Each object has an origin (marked as a small orange circle). The reference source is used to apply the transformations and can be used to help position the object.

The 3D cursor indicates the point in space where the objects created are inserted. The cursor amending pressing the left mouse button. We can jointly use the cursor and source to make fine adjustments to the scene. For this we have operations to modify the cursor and modify the source of items:

Snap cursor (in Object> Snap> Cursor to selected) places the cursor over
the item (object, face, edge or vertex) selected.

Snap selection (in Object> Snap> Selection to Cursor) transforms the object
selected for its origin is placed on the cursor.

Transform origin (in Object> Transfor> Origin to 3D Cursor) places the
origin of the object selected in the 3D cursor, without modifying the object.

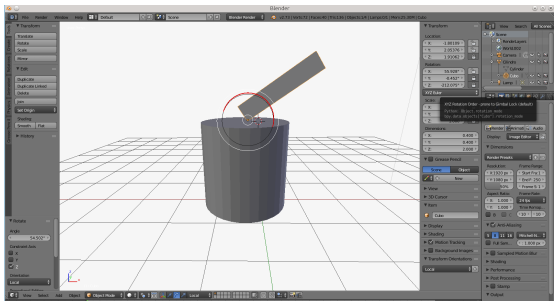

Figure 3: by modifying the source

Amending previous model to place the right cube in the center of each upper cylinder and make the origin of this cylinder in one of the edges of the lower face. To do this you can:

- Select the bottom face of the cube and fi xing the cursor on it sets the origin of
- the 3D cube cursor
- Select the top face of the cylinder and fi xing the cursor in the center.
- Transforms the cube to place the cursor on Select a lower edge of the cube and fi
- xed the cursor on it sets the origin of the 3D cube cursor
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Enable rotations of the cube and observe the results (see Figure *3*).

3.4. Restricting transformations

We may limit the range of values of transformations using restrictions. In the window *properties* look for the button *constraints* and adds a restriction of limiting transformation.

Adds a restriction to limit the rotation of the hub between 0 and 90 (see Figure *4*).

3.5. applying transformations

The transformations that are applied to objects are made, so that each object is applied to the result of the composition. In some cases this can be a problem when we want to control the transformation of moving parts. We can make the vertices will transform one

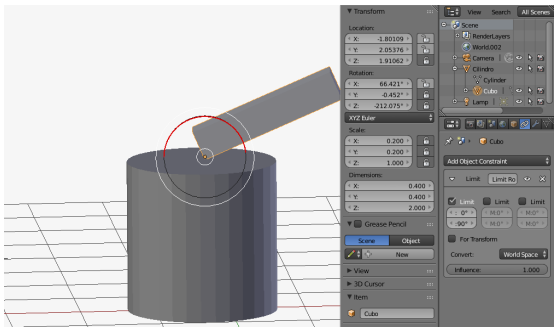

Figure 4: Restricting movements

object by applying the current changes and thus leaving the identity transformation. To do this we use the command: *Object> Apply (* or Ctrl-A).

3.6. Process

- Test functions described in the script
- If your project includes any articulated object as a graph Design It scene, creating a model in Blender joints containing the object. Otherwise choose a simple and Design It articulated object. Briefly explain the process you followed.
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3.7. Documentation to be submitted

- Blender model format.
- Text explanation of the process that you followed.

3.8. Evaluation

In practice the following aspects will be assessed:

- Model complexity.
- Precision model (similarity to the real object). Design process
- followed.

Each of these aspects will be assessed with a maximum of 4 points, the practice is evaluated over 10.

Bibliography

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