Blender Basics for Makercie Hologram Pyramid Activity

Freddie Hendriks

December 6, 2017

Blender is an open source 3d modeling program that is used for creating three dimensional models that can be used for animations, video games, 3d printers and so on. In Blender you can create objects, deform them, sculpt them, paint them, give them textures, use them in physics simulations, and many more things. We are going to use Blender to make videos for our hologram pyramids. But before you start, you have to know the basics of Blender. This guide serves to tell the basics of moving around, adding objects, moving the light and camera's, create an animation, and making hologram pyramid movies from these animations.

1 panels

Blender has a variety of panels to display and control all data. The default window of Blender looks like this:

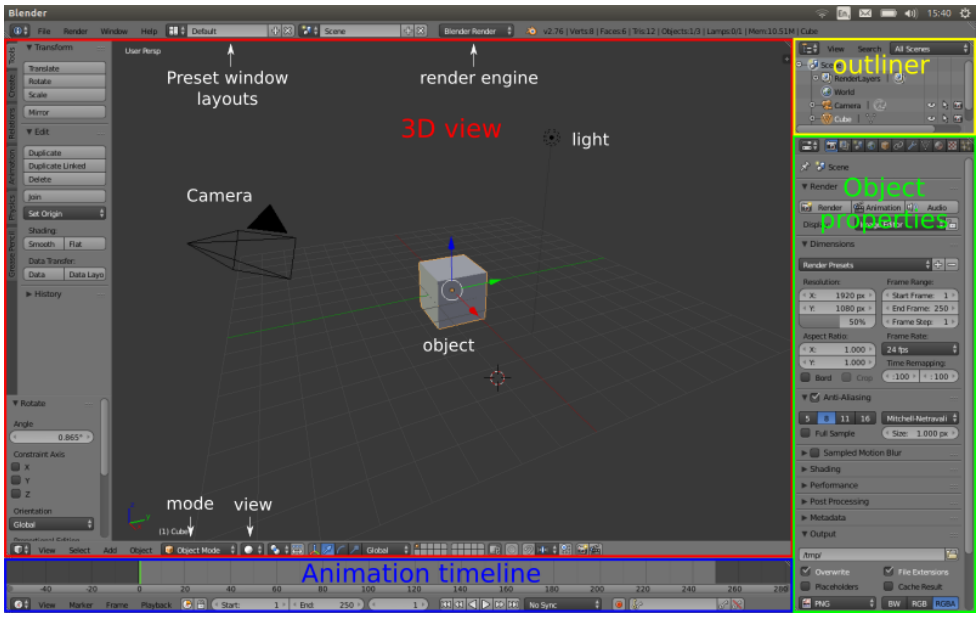

Figure 1: The panels in the default window of Blender.

It consists of the following panels:

- **3d view:** view and manipulate your 3d creations.
- **properties:** change properties of the selected object.
- **Animation timeline:** Select a particular frame of your animation, play animation, etc.
- **outliner:** overview af all object and data in your current session.

Other panels that you will need are:

- **movie editor:** to make your animation suitable for a hologram pyramid
- **graph editor:** control the interpolation of moving objects between different frames
- **node editor:** indicate the way your objects should interact with light.
- **dope sheet:** edit the key frames of your animation.

Whenever you can't find the function you are looking for, hit the spacebar to open the search function. Simply enter what you want to find.

2 Moving around the camera and objects

To view your 3d objects from different angles, you must move around in the 3d view screen. You can move your current view and you can move the camera that is used to generate your final images. Other objects can be moved as well. Below is a list of the various ways to move around your current view, your final view (camera), and objects

2.1 the view

- **rotate view:** push mouse wheel and drag the mouse
- **move view:** push shift + middle mouse button and drag the mouse
- **top (bottom) view:** (ctrl +) numpad 7
- **front (back) view:** (ctrl +) numpad 1
- **side view:** (ctrl +) numpad 3
- **zoom in/out:** scroll
- **and zoom to selected object:** numpad .
- **switch perspective** numpad 5
- **toggle view to active camera** numpad 0
- **make selected camera active** crtl + numpad 0
- **move camera to current view:** crtl + alt + numpad 0

- **move camera while viewing through it:** select camera box, press G, or G + mousewheel to move towards or away from focus
- **rotate camera while viewing through it:** select camera box, press R, or R + mousewheel to look around.

2.2 objects

- **Add object:** shift + A. Once you added an object, you can change some of its properties in the lower left panel only if you haven't touched the object.
- **select:** right mouse button. Can be changed to left in File $->$ User preferences $->$ input $->$ select with
- **remove selected object:** x or delete
- **scale selected:** S + drag mouse
- **move selected:** G + drag mouse
- **rotate selected:** R + drag mouse
- To scale, move or rotate about a particular axis, type in addition to S, G or R an X, Y or Z. Or hold the middle mouse button while dragging the mouse

2.3 Background color

Your holofram pyramid videos need a black background. You can set the background color in the Default window layout in the Object properties panel. Click on the world pictogram (top row), then click on the grayish rectangle below the text 'Horizon Color', and set the color to black.

2.4 Youtube tutorials

It takes too much time to explain every feature of Blender in this document. The fastest way to make an animation or a 3d object is to watch a youtube tutorial. Below is a list of tutorial that you can use. Pick the one you like most. But if you want to do something else, feel free to use any other tutorial.

But before you start, remember that for a hologram pyramid video your objects need to be bright and your background black.

Some specific stuff

- **moving text:** `https://www.youtube.com/watch?v=bF3O4qbaMqs`
- **fire:** `https://www.youtube.com/watch?v=u-zK7Bu8cAI`
- **sparks:** `https://www.youtube.com/watch?v=QCMyvcc3ZaU`
- **rigid body simulations:** `https://www.youtube.com/watch?v=nHVYYMG3QVY`
- **glow:** `https://www.youtube.com/watch?v=kDVyltB1Yu4`

- **ink drop:** `https://www.youtube.com/watch?v=iw8hj2Uycvk`

Some general stuff that you can use in all your projects

- **modeling your own objects:** `https://www.youtube.com/watch?v=ZtSh4Yedafg`, and if you want to do some more difficult stuff `https://www.youtube.com/watch?v=y__uzGKmxt8`
- **give objects a texture** `https://www.youtube.com/watch?v=izqZe8s_Jmw`
- **lighting** `https://www.youtube.com/watch?v=0rbPwn-I0oM`
- **basics of animation:** `https://www.youtube.com/watch?v=n0VspDUOErE`

3 Make hologram movie from animation

Once you finished your modeling, you can start to render your animation, i.e. make an actual movie or a sequence of pictures. Do this for each of the 4 cameras. Then choose from the preset window layouts the 'video editing' layout. Do the following steps:

1. *Either give your just rendered animation / picture(s) a name that is different from the default name, or make sure that the destination location in which Blender saves your renders is different from the location of your just rendered animation / picture(s). Otherwise it will be overwritten and it will be gone!*

2. load the front, right, back and left camera movies in channes 1 - 4 by clicking Add $->$ movie or Add $->$ image

3. add an effect strip for the front camera movie by selecting the front camera strip, then clicking Add $->$ Effect Strip $->$ Transform, and
   set 'Blend' to 'Alpha Over'
   set the y-position to -36.764706
   select the box 'Uniform Scale'
   set the scale to 0.264706
   set Rotation to 180
   select the box Flip X

4. add an effect strip for the back camera movie by selecting the back camera strip, then clicking Add $->$ Effect Strip $->$ Transform, and
   set 'Blend' to 'Alpha Over'
   set the y-position to 36.764706
   select the box 'Uniform Scale'
   set the scale to 0.264706
   set Rotation to 0
   select the box Flip X

5. add an effect strip for the right camera movie by selecting the right camera strip, then clicking Add $->$ Effect Strip $->$ Transform, and
   set 'Blend' to 'Alpha Over'
   set the x-position to 20.680147

select the box 'Uniform Scale'
set the scale to 0.264706
set Rotation to -90
select the box Flip Y

6. add an effect strip for the left camera movie by selecting the left camera strip, then clicking Add $->$ Effect Strip $->$ Transform, and
   set 'Blend' to 'Alpha Over'
   set the x-position to -20.680147
   select the box 'Uniform Scale'
   set the scale to 0.264706
   set Rotation to 90
   select the box Flip Y

7. Check if your output settings are the way you want. If you want to make a GIF, then use a picture format (JPEG, PNG, etc) instead of a movie format as output. These pictures can be made into a GIF using another program like GIMP.

8. render your animation

If you have chosen to output every frame as a picture (by selecting a picture format at the output parameters), then you can make a GIF out of it as follows:

- open GIMP
- Click File $->$ Open as Layer, select all your pictures (your frames) and click Open.
- Go to Filters $->$ Animation $->$ Playback, adjust the frame rate to the one you used in Blender (probably 24 fps)
- Go to File $->$ Export As, select GIF image (*gif), *make sure that your file name has the extension .gif.* and hit Export.
- Select the box As Animation and hit Export. Now you should have a GIF.