

## **The Instructions on Video Work**

### **\*Turbine and the bulb work**

This work is inside production/shot\_01/materials folder.

**Step 1** Download the Turbine video with green background.

**Step 2** Then put it in compositing option into Blender then use chromakey. In chromakey choose the background color: in our case it is green and it will remove the background color and make it alpha transparent.

**Step3** Render it and export it as PNG file sequence.

**Step 4** Download the Bulb image, with black background in my case, and edit it in gimp. Choose the color black of our background and remove it with transparent. It removes all the black color from the image. Export it.

### **Camera Work Shot #1 (explanation with Turbine and the bulb work )**

We took the shot with static camera angle. While shooting, put some marks or small objects on the hands. The marks or objects will be used to do motion tracking.

Then, place the shot1 into the movie editor option on Blender.

**Step 1** Set lens and camera configuration (it depends on your camera), in our case it is Nikon DX with 24mm lens. You will find that option available on a Blender lens and camera list.

**Step 2** On the right hand side of the screen you will see the objects option; in that, below the camera, add two new objects and name them "generator" and "bulb".

**Step 3** Then for the generator object choose add Markers and place it on the features which are the mark on the hand and the thumb. Then use track option and play the track so that in all the frames it will track the positions of the mark on the hand and of the thumb.

**Step 4** After that, choose the bulb and add the markers of the respective hand, as we did in step 3 for the generator.

**Step 5** Now you can use this movement of the track, in geometry option choose "Link empty to track".

Open 3D viewport, in the "solver" tab press "set as background" in the scene setup. Now your video is in the background with grids.

**Step 6** Now do the camera alignment by hand. The 3D space perspective and its grid should match the background video. For more complex situations you can search for an add-on called BLAM for Blender.

**Step 7** In order to create turbine and bulb add planes, so that you can place your images on it for creating a billboard. Create elements for background effect similarly.

**Step 8** Select the plane and apply a constrain called "object solver". Select the created objects in motion tracking (generator and bulb) respectively. Then, you will get you objects in right place.

**Step 9** Use the compositor to setup a system that will "alpha over" the objects (such as bulb billboard) on the movie clip as background of your choice, as you can see in shot 01\_01.blend in the compositing tab.

About the Simulations codes in this scene. That Simulation codes box is created with "google draw". It creates png with transparent background, so you can directly use it in Blender.

The same technique was used for the simulation codes and the paraview catalyst generated cube. But for releasing the cube and simulation codes you just need to animate the decreasing of the influence in the "object solver" constrain. So that it gives a real impression of releasing the cube in frames.

The same technique was applied in the Tornado and the equation scene but without using motion tracking. The equation are taken from our project research paper.

## **Book Animation**

**Step 1** The book animation is downloaded from YouTube, and is free to use. I've taken the final frame with the open book in order to create the titles inside The GIMP.

**Step 2** In GIMP import the book file and use Text option to write the required text on the right place. For example, for the heading in the video I wrote the text on the left page of the book.

**Step 3** Use the Perspective option and transform it a little (to match the perspective with the page of the book) in such a way the text will look like it is written on the book.

**Step 4** Then use the rectangle select option and Select the First part of the text and create a new layer of it with transparency. Similarly do it for the other line of the paragraph. (Lets say the paragraph contains 5 lines )

**Step 5** Then you will see that you have 5 different layers and then export in PNG format.

**Step 6** Now you can put these 5 PNG files on video editing on Blender and apply transform feature and add the effects. The whole work of Blender is in the montage.blend file.

### **How to place the IMAGES on the book**

**Step 1** Grab the first frame from the shots and do the same with the simulation results generated from paraview.

**Step 2** Now you have the images. Put them on Gimp and perspective rescale them to the size you want them to appear on the book. Then save the images as a png with transparency.

As you have the images with transparency you can import them in video editing time line in Blender. The book image will be the background base image on Blender time line.

### **The Puzzle scene**

As you can see in the video, the puzzles connects and show the overall program configuration.

- Create an image of puzzles and import it to google draw and add any text you want.
- Use the image as a backdrop in Blender in the 3D viewport.
- Recreate the puzzle pieces along the image guidelines. Those pieces has been animated with classical interpolation.