Animating Impossible Objects

Explore animating impossible objects with shape, color and rhythm

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Abstract

The impossible objects two-dimensional drawings that form in an inconsistent way create a visual illusion in certain circumstances that presents a false impression of reality. My practice has been focusing on creating an impossible motion graph by experimenting its shapes, colors and rhythm
I experiment several types of impossible objects with illustrations and animate one famous impossible object —the Penrose triangle and create a short loop animation. Hopefully, I'll be able to finish 30 seconds motion graph about animating the transformation of multiple impossible objects.

Authors Keywords

optical animation, iImpossible objects, motion graph, color experiments

Contents

I.   Introduction

L, S, Penrose and R, Penrose (1958) define the impossible object is a "Two-dimensional drawing can be made to convey the impression of three-dimensional objects. In certain circumstances, this fact can be used to induce contradictory perceptual present note deals with one special type of figure."

Impossible objects can only be viewed from one angle and can't exist in real world. To judge the object is impossible or not, it must view as the impression of three-dimensional object. In addition, to be an impossible object" not only depends on the property of the drawing, but the property of its spatial interpretation by a human observer. (Khoh & Kovesi 1999).

To draw and animate the impossible objects, I need to understand the contradictory space the impossible objects create.

II. Project Intention

For this folio, I experiment several types of impossible objects in 2D illustrations and animate one famous impossible object — the Penrose triangle. I create a short loop motion graph for Penrose triangle.

My practice has been focusing on creating an impossible motion graph by experimenting three stages. How to create impossible objects with simple shapes? How does colors form three-dimensional objects? And how to animate the rhythm when the impossible objects transforming?

I intend to produce a short animation about exploring movement and transformation of the impossible objects.

III. Related Works
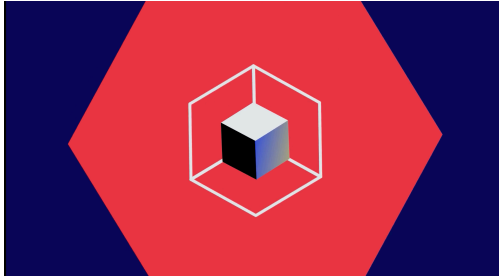
SOMEI (2017) creates a 30 seconds animation for Ningbo TED. He animates the transformations between the Penrose triangle and a cube. The whole animation is well made. He pays many attention on the acceleration and deceleration with the movement. The transitions of each part are also very smooth. Moreover, the impossible objects are colored brightly. He also use the line create the contradictory space to enhance the impossible objects.

TEDxNingbo OPENING:
<https://vimeo.com/190046366>
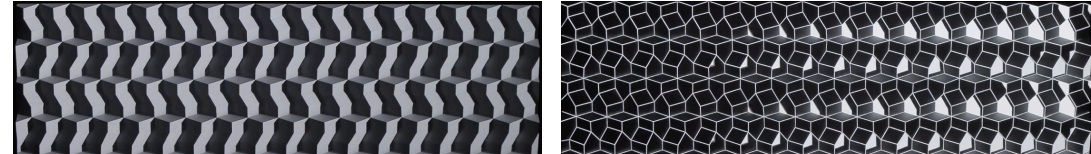
Escher X nendo | House of movement :<https://vimeo.com/312094091>.

Part of a collaborative exhibition between Dutch graphic artist M.C. Escher (1898-1972) and Nendo held for four months at the National Gallery of Victoria in Melbourne, Australia.

House of movement (2019) incorporates a house motif with an animation, projection mapped directly onto a geometric, tile-like base. This was designed as a three-dimensional relief using a two-dimensional house pattern. Inspiration was taken from Escher's works as he investigated the perfect geometry of crystals and Platonic solids. In the same way Escher expressed the tension between order and chaos, these houses express a state of flux between two-dimensionality and three-dimensionality. By creating digital optical illusions, the animation changes the depth, layout and color of the base and creates new movements that exist between the accurate physical dimension and the limitless digital world.

IV. Method

METHOD				
RESEARCH	week1-3	Research on impossible objects	Finding related works	2D impossible object illustrations
EXPERIMENT	week4-6	Color design	Animating a test in After Effects	Reflection
	week7-9	Finding sound	Animating based on the sound track	Reflection
PUBLISH	week 10-12	Adding transitions	Combine the outcomes	Refine and Reflection

This method investigates the possibilities of the animating impossible objects by practice-based theory. I'll gain new knowledge partly by means of practice on researching impossible objects and animating motion graphic.

The method is divided into three phases which are researching, experimenting and publishing. In researching state, I start with finding existing impossible objects and related works about animating impossible objects. Next, I test the color with the objects that I found in the experiment stage. I animate a short motion graph about the Penrose triangle in After Effects. In the next six weeks, I'll find or design a short sound track. Then, I'll be focusing on experimenting the shape, timing and rhythm around the couple of impossible objects. I'll add transitions and keep refining the animation in the last publishing stage.
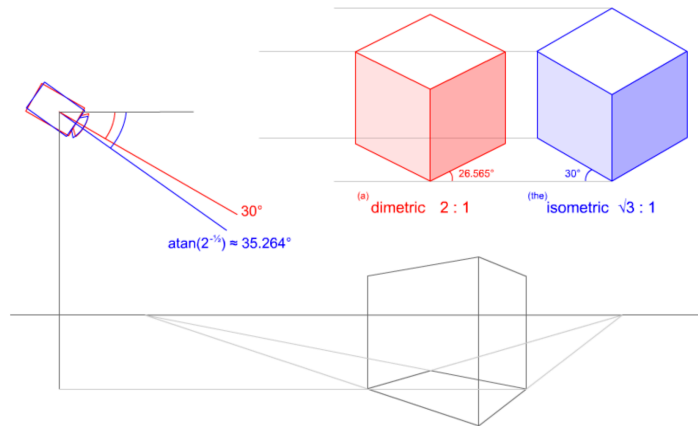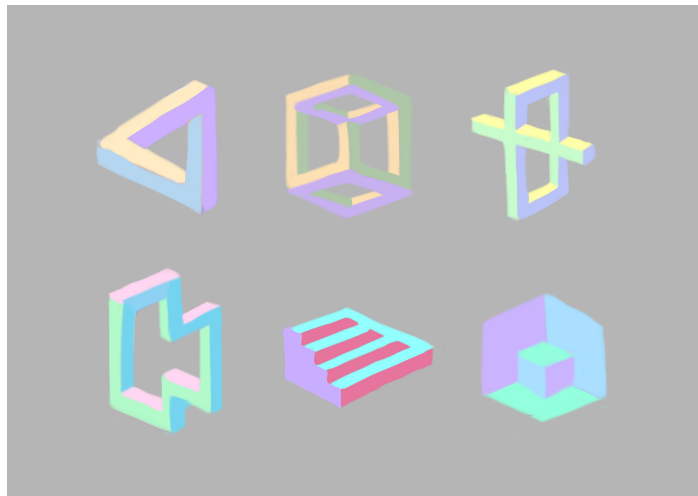
figure 1 Isometric projection

figure 2 Impossible objects color tests

V.Experiment Stage

•Shape

To draw impossible objects which based on a cube, we need to view from isometric projection. Stevens and Wilson give the definition of an isometric projection (2015). Isometric projection is a method of showing a building with an illusion of three-dimensional form by drawing a plan to scale but not with right angles (being set at 30° to the horizontal), and projecting the vertical axes to scale. Thus the plan is slightly distorted, but the effect is more realistic than in an axonometric projection, although diagonals and curved lines are not accurately depicted. (figure 1)

In figure 2, I draw some types of existing impossible objects that have been found by different artists. The one in the up-left corner is the Penrose Triangle (1958). And the one next to Penrose Triangle is according to Belvedere (1958) created by M.C.Escher. Also, The last one is according to his Convex and Concave (1955).

These impossible objects can be seen as comprised by many small cubes. Thus, the shapes are able to be draw under the isometric view.

•Color

I color the impossible objects in order to create a false impression of 3D objects. Basically, the colors of one objects are divided into 3 gradients, which are light, gradient and shade. In color test, I look for hue rather than brightness.

• **Rhythm**

I make this Penrose triangle test in After Effects. First, I make three rectangles with different color in different layer and make the layer 3D. These three rectangles are three sides of a cube. I rotate two side of the rectangles to form a cube. Then, I add a null object in the layer as the controller of the cube I set the position of the null object in the center of the cube. To make the null object control the cube, I parent three side to the null object. I change the rotation of the controller with y in 55 degrees and z in 45 degrees so that we can see the three sides of the cube. The 3D cube has been create. I pre-compose the all the layers to use it later.

To set the isometric camera in the scene, the focal length of the camera needs to be extremely long. I set it 1000 mm.

With the pre-composed cube in the scene, I animate the moving track of the cube. Basically , the Penrose triangle is a triangle with 60 degrees angles. So I moving the position of the cube and use the Echo effect to record the moving track. I test the Echo Time and Number Of Echoes to get the stable animation. (figure 3)

However, there is a problem with the end of the triangle. So, I duplicate the layer and add time remapping to the top layer to keep the shape of the last frame. Then, I add a mask to cover the end of the triangle. A Penrose triangle motion graphic has been done,
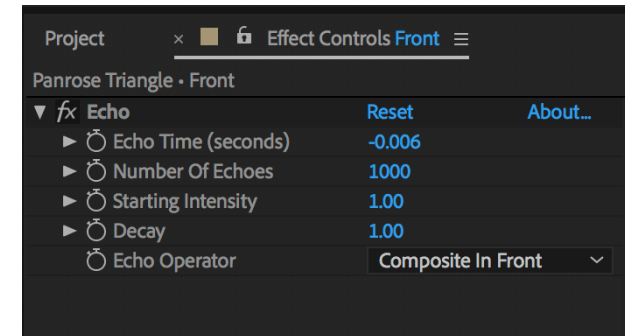

figure 3 Echo attributes
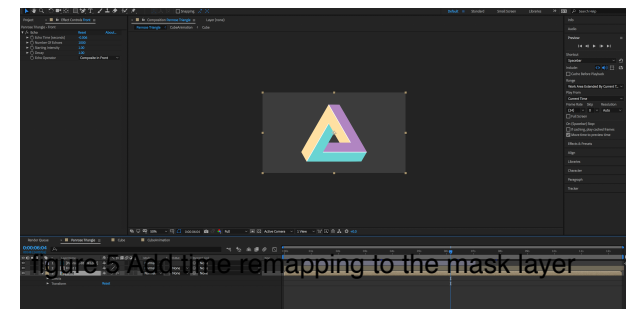

figure 4 Problem with the Penrose triangle

figure 5 Add time remapping to the mask layer

VI. Conclusion

At the end of semester, I aim to create a short animation about animating impossible objects. I will find the movement with those impossible objects that I referred. Furthermore, I will focus on the transition between different impossibles. The acceleration and deceleration of the movement will also be part of the experiment I am going to do.

This folio presents the research and part of exploration stage, which provides a foundation for the next six weeks to creating a complete short motion graphic, based on the sound.

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