Classical Principles for 3D Film Production Design

by Richard Reynolds

The American Film Institute Conservatory uses a multi-skill approach based on the screenplays' characters to develop set design for film. The emphasis is on design solutions that complement the narrative, that is, the storytelling of the screenplay and the characters within.

These skills are taught in a two year MFA program in separate classes of film analysis, storyboarding and illustration, drafting for construction documents, 2D computer graphics and 3D modeling and rendering using **form•Z**.

The American Film Institute Conservatory is an accredited two year MFA program, granting a degree in Film Production Design, as well as the areas of producing, directing, writing, editing and cinematography. AFI fellows are actively involved in making student films throughout their time at AFI.

2D computer skills are taught in the first year and **form•Z** is used for 3D computer modeling and rendering in the second year. This course is a 3D computer design practicum for film production design purposes, using classical architecture to illustrate the principles of design and 3D computer modeling. Additional emphasis is placed on specific film production design conventions and techniques.

We utilize **form•Z** for 3D modeling of our film sets, rendering for conceptual presentation and keyframe illustration, 2D drafting for set construction documents, and animation both to explore a set spacially, and to present the set as a specific film camera will see it to the director and producer.

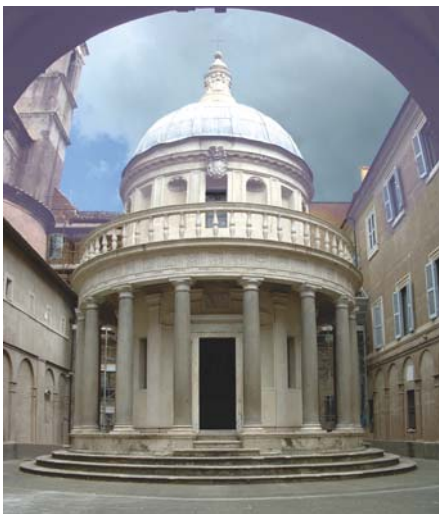
We begin with simple modeling exercises, then study classical proportions in 2D and then in 3D while modeling columns and entablature. Signage is an important component in art direction for film and **form•Z** is a great place to create signs of all sorts. We proceed to model, texture map, light, and render Bramante's "Tempietto", Rome (1502), in order to refine our design and modeling skills.

We also use Borromini's work on St. Ivo della Sapienza, Rome, (1643), for advanced nurbs modeling and sophisticated geometric planning.

The last part of the second semester is devoted to the students' Final Project, which is a film of their choosing, redesigning one or two key sets in coordination with similar work in their other academic courses.

Included with this article are write ups of two Final Projects by Javiera Varas and Lei Jin. They both describe the guiding design elements and other considerations of their projects.

In the design work of these two students the principles of classical architecture are imaginatively expressed through the sophisticated use of proportion, symmetry, balance and hierarchy. They have each created unique spaces that exemplify character and support the story, leading us, as the movie viewer, to a fuller understanding of the narrative and a deeper, more emotionally-based experience of the film.



Bramante's Tempietto, Rome, 1502

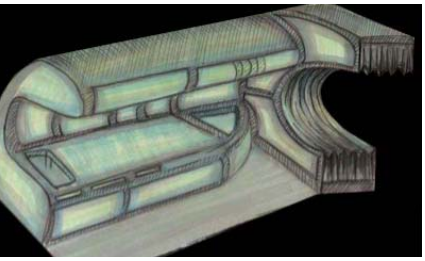
Richard Reynolds works as a 3D computer Set Designer for feature films in Hollywood, Ca. He has 28 years experience as a film Production Designer, Art Director, Set Decorator and Theatrical Stage and Lighting Designer. Architectural illustration and animated pre-visualization is a current area of work as well. He has taught at the American Film Institute for the past 9 years as a **form•Z** Principle Investigator, specializing in the use of 3D computer design for film Production Designers. Recent credits include "Pirates of the Caribbean 2 & 3", where he designed 'Davy Jones' pirate ship, "Sky High", "Superman-Flyby", "The Terminal" and "Minority Report" directed by S. Spielberg, "Cat in the Hat","Envy","T3", "Solaris", "Planet of the Apes", "Pearl Harbor", "Mission to Mars", "Carnivale"-pilot, and the soon to be released "Disturbia". He was the Visual Effects Art Director in charge of designing all the miniature special effects shots for "Batman & Robin", and has designed for all formats of television. Reynolds' work as a 3D designer has been published in Computer Graphics World, on display at the Art Directors Guild in Hollywood, used as advertising graphics nationwide for **form•Z**, and he is a frequent contributor to **in•form•Z** and the **form•Z** Calendar. Reynolds holds a B.A. degree from Pomona College, Ca. and an M.A. from San Francisco State University, both in Stage and Lighting Design.

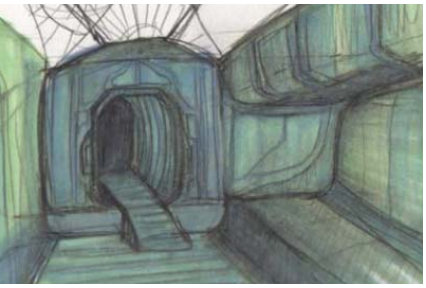
THE FIFTH ELEMENT

Re-design by Javiera Varas

The Fifth Element is a movie famous for its high visual concept, great cast and involving story line, so the exercise of re-designing it was not an easy task. As the title enunciates, the core of the movie is about the 5 elements (water, fire, air, earth and ether) and how their harmonious integration will ultimately save the world. This statement gave me the foundation from which to work: the elements.

First, I tried to understand what each character's personality was and with which element they could best relate. Secondly, I translated this language into space, into an environment in which they can not only be the element, but also provide the necessary tension and atmosphere for the scenes to unfold. This way actors move through a space that is supporting the action and providing a visual context of significance.

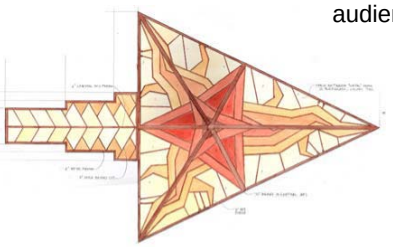


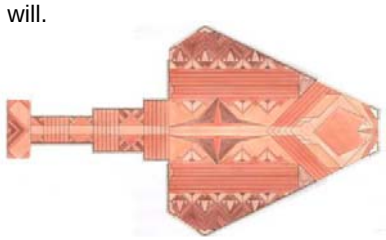


The first set I designed is Korben's apartment (Bruce Willis' character). I assigned him the water constitution because his personality in the beginning of the movie is melancholic, stagnant, apathetic, stuck. This water affiliation led me to design with curved patterns and reflective materials, also a paint treatment to simulate stagnant water. The center part of the set is small and cave-like, to accentuate the claustrophobic feel and show how the character is trapped in his reduced space/life. The different compartments of the room open and close in regard to the action, allowing the space to be more flexible and adaptable to a moving camera.

The second set I designed is Zorg's office (Gary Oldman's character). I assigned him the fire constitution, as he is a very aggressive character, ambitious and cruel, the perfect antagonist. Since he has dreams of conquering the world, I was inspired to incorporate elements of fascist architecture, where high thick columns and tall ceilings give the impression of a very imposing space. The color palette I selected is red rusty tones, while the marble surfaces provide the necessary coldness appropriate to the character. A glass ceiling as well as huge glass windows with fire patterns allowed for interesting lighting possibilities. The different levels were crucial for the action, as the attending monk had to be constantly rising in order to reach Zorg.

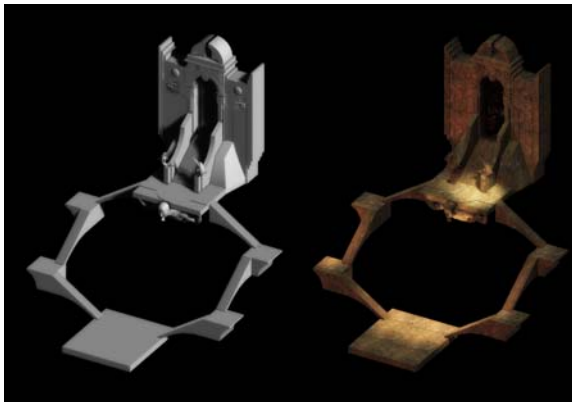
form•Z was an essential tool in the pre-visualization of this project. It allowed me to render these sets in a reasonable time frame and to have an accurate sense of materials, lighting and camera angles. It even allowed me to create a camera move I thought would be appropriate for a specific scene within the set, the final confrontation. Since this is a re-design exercise for a motion picture, the way the camera sees the set is the way the audience will.





JOURNEY TO THE CENTER OF EARTH

by Lei Jin



A grand entry to the lost city of Atlantis, was one of the scenes I selected for an experimental project Journey to the Center of the Earth at the American Film Institute. This movie was first made in 1959 and is an excellent film for its day.

For my assignment, I wanted to enhance the look of the final sequence "Atlantis City" taking it to a more extreme and mythical level. The entry to Atlantis, as the first impression of the underground ancient empire, deserves a marvelous look according to the script. I started with the idea of putting a giant gate high up on a cliff above an abyss. By raising the camera up from the dark abyss to our world, the entry's unique architecture could be revealed dramatically, enhancing the excitement in the upcoming intense drop scene.

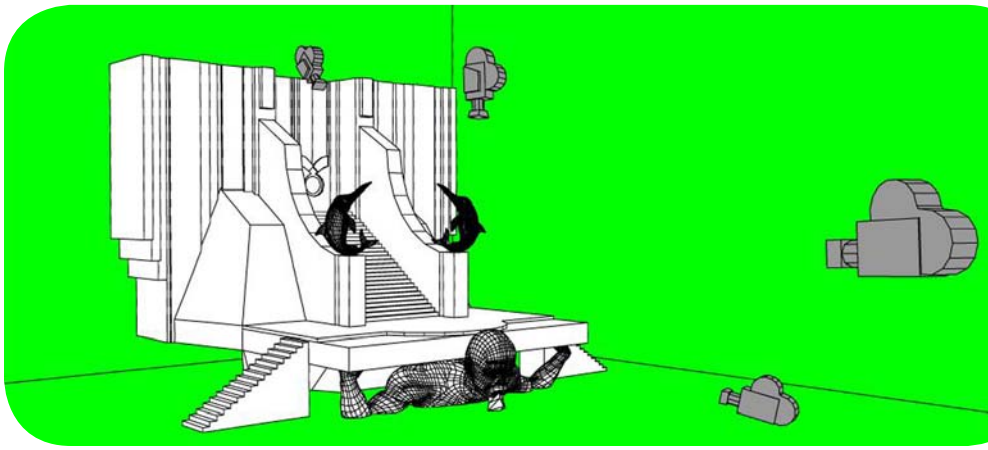
With this concept in mind, I sketched a number of options, also blocked in some simple 3D geometry and viewed them in a virtual camera in **form•Z** to help instruct my vanishing points, space and composition for line drawings. Once the basic shapes were finalized on paper I began to lay it out in the more traditional manner of drafting. Different from concept sketching, a lot of decorative details need to be defined in this process, and most importantly, it makes a set understandable to a construction crew and also reasonable to financing producers.

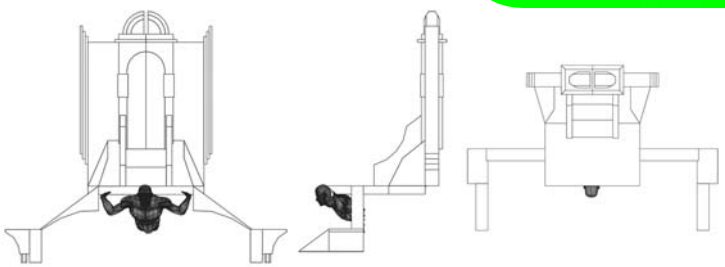
Remarkably, **form•Z** was involved in this process and became a great tool again. By developing the simple 3D model I used before, my drafting had gained additional detail from its top, front and side renderings. And this continually developing drafting became a vital reference for my 3D model and rendering later on. So within one process, I was actually able to finish two tasks, and both would be integrated in my final product.

Out of the need to achieve this ambitious scene cost-effectively, the use of a "green-screen" to allow for the later compositing of digital visual effects, had become necessary at this stage. The biggest challenge was how to partition the green-screen area off from our physical, construction set. Within a digital 3D environment, I could layout all possible camera positions, angles, lenses, and actors' moves, and I could also animate the scene in various ways, to help figure out how much space would be required to build a real set, and what parts could be digitally added in post-production.

To present my final design to directors and producers, I still needed one more step, the final rendering. But before I started this step, I first needed to determine the atmosphere and lighting sources for the images. I decided that my light source should come from the bottom (emanating from the earth's core lava), and I wanted to create a horrific scene.

I worked first with the lighting, because in this scene, I wanted to use only two texture maps and allow my lighting to shade and highlight the surfaces in unique ways.





Any complicated movie shot can now be completely designed and visualized in a digital program, like **form•Z**. In this project, digital media offered me a great opportunity to explore and investigate my design choices. **form•Z** is not only a final presention tool, but also an idea generator.