

Design and Communication of Architectural Space Using 3D Graphics and Film Language

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1 Introduction

This paper will look at using film language to encourage architecture students to more fully utilize 3D modeling and animation software in the architectural design process and in communicating the results. Specifically the paper will cover the work and processes of twelve upper-level architectural students over the course of a year long studio and the making of a computer generated short film. *Rule 68*, takes place at a Benedictine monastery that was designed for the film. The studio combined architectural design methods with the process and concepts of film production.



Figure 1. Screen shot of monastery cell and characters.

2 Intentions

The premise of the studio was to fully utilize the usage of 3D modeling programs such as 3D Studio Max in the architectural design studio. For the most part, students typically use the software in making 3D models to study form and space and then render single scenes or images to study light and material in relation to form and space. Animated camera movements through space known as a fly-through are also used. The studio took the position that these approaches were not providing a complete experience or immersion into the space being designed. We had the images and we had motion but something was missing. We were not speaking the right language.

3 Film Language

The conveyance of our intentions to others is dependent on a common reference of visual, auditory and verbal language. Film with its constitutive image and movement (duration or time) establish a narrative—a connective tissue of relationships between images [Flaxman, 2000]. What we were missing was the narrative—the concept that makes us care about the image and makes us part of the experience. Film has often been described as one of the most complete arts using, narrative, light, form, space, sound, and motion. Architecture encompasses all of these as well but we were not letting narrative, the action-taking place in the

space, the spatial qualities of sound or the way motion builds a spatial experience over time, impact our work. We had to use film language.

Just about everyone is familiar with film language, the story, the editing, the sounds, etc. While the language of architectural representation is a specialized encoding, the language of film is a relatable common denominator that allows those not versed in architecture to grasp the nature of an architectural space. Who doesn't have a more vivid sense of the Roman Coliseum after watching *Gladiator*?

The studio looked to filmmaking where the computer generated image is being used to simulate places that really didn't exist. The work in films is successful at bringing us into the experience and believing that the yet unbuilt is present. As architects we are trying to understand and communicate the experience of the places we are envisioning. The current conventions of plan, section, perspective, cardboard models and 3D models are important but as we use the same software that filmmakers use we aren't offering others or ourselves the same immersive experience.

The key factor in what good film does to make us present in its space is the story it tells—that we become interested in and want to follow. While the Roman Coliseum is exemplary in its architectural conception it is the dramatic construction of the film, such as *Gladiator*, that brings us into the space that is now long removed from its completeness. For us to consider architecture and communicate this architecture we had to tell a story.

4 Narrative Informs Design

In the studio, film language was used to move away from thinking about the architecture as the place for generic architectural actions to a filmic critique based on the architecture serving the specific actions of a character and how the architecture supports the significance of the narrative. In other words, the studio added the narrative intentions of the film to the architectural conventions that evaluate the design's fulfillment of use, space, form, physics, etc. The architecture would not be presented or evaluated simply on its own but would be part of a story being told so that the architecture could be experienced from a known point of subjective view—that of the characters acting in the space—and our, the audiences, objective view of the action—the view of an off-screen observer [Mascelli, 1965].

Offering the designer and the audience a reason to think about the architecture on screen creates empathy for the space. The spatial experience becomes meaningful. For example, the courtyard apartment building in Alfred Hitchcock's *Rear Window* (1954) was actually built in a studio and the design of the architecture is clearly determined by the narrative intentions. James Stewart's apartment, for example, is laid out so that the center of interest in the space is weighted toward the courtyard edge where he spends his time looking through a window projecting into the courtyard. His character remains fixed in this position perfectly supporting

his voyeuristic interest in the courtyard and adjacent apartments. Other characters in the film revolve around him interacting with the architecture such that his character symbolically and literally is on the edge. Ultimately he is literally exposed by being pushed into the space of his voyeuristic absorption. Because the story interests us we engage with the characters and the architecture they inhabit.

Students used these insights to design the spaces needed in their film and determine form, material and light quality. Considering where to put the camera, the staging of the actions, and the meanings of the narrative influenced the design of the architecture.

5 Process

Early work in the studio involved learning the language of film and developing the necessary knowledge of the 3D programs and editing software. Students worked on very short films involving video to learn how to construct a film and later moved onto computer generated images and animation in a film based on a simple cube building.

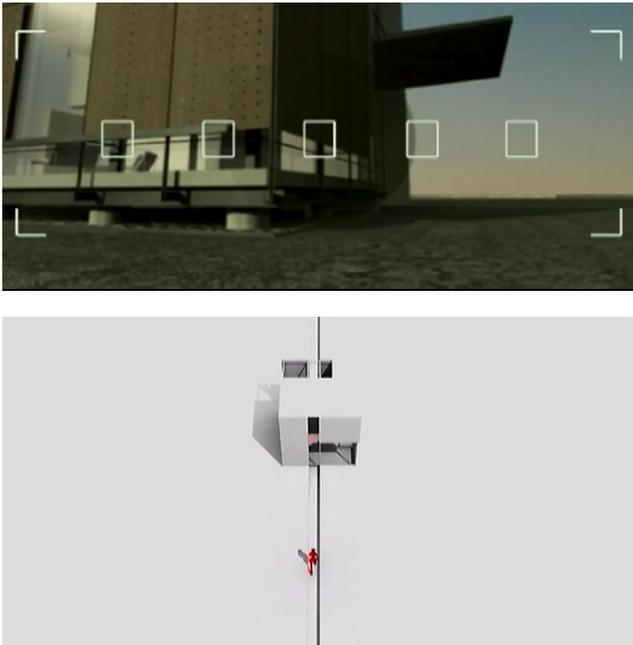


Figure 2. Cube film screenshots.

The studio's primary architectural focus was the design of a Benedictine monastery that would become the setting for a short film involving several monks and an architect, *Rule 68*. A basic script was provided and the students were free to interpret the script.

In the conventional architectural education studio, a project is assigned and the students' study and research the nature of the activities the building will serve along with the site. The students then proceed to work on designing the building using models, drawings and computer images to communicate the ideas to design critics, etc. In this studio a different approach was taken. The studio was modeled after the production process or pipeline of a film. Starting with a script, research, storyboards, animatics, pre-production, etc., the students designed the architecture based

on the needs and ideas of the script. The students were held accountable to the laws of physics in that the architecture would have to stand up and be buildable in the physical world.

Preproduction work lasted one semester and involved designing the architecture or locations for the story and the characters. Cardboard study models, 3D models, plans, sections, sketches and storyboards were developed. 3D characters were designed and modeled to inhabit the architecture. The students also made a rough cut of the film with 3D computer generated models and a green screen to place real actors in the scenes to test how people would appear in and use the architecture. This work was reviewed by outside critics.

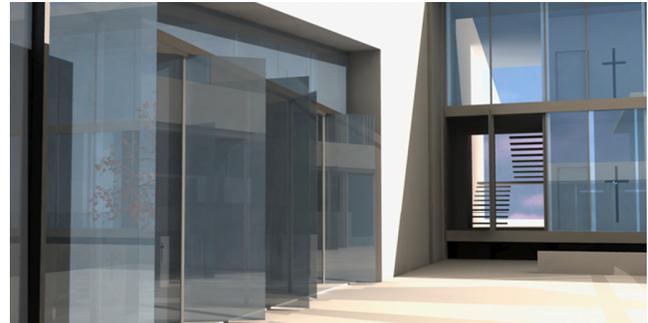


Figure 3. Screen shot of monastery chapel.

A departure from the typical film production pipeline was to compress production, post production and editing into an incremental process whereby the students worked quickly to model, animate, render and edit the films into a rough cut that was reviewed by outside critics. This work was then taken through the process again with further refinement for a second and third reviewed preview. The films were finalized after the third preview for final presentation. This procedural change supported the architecture student's proclivity to react to their designs more productively when they actively make things. In a way the film became a study model that was put together, pulled apart, changed, etc., until it took its final form. This process was a blending of architectural education conventions and film production.

Production, post-production and editing took place over the second semester in the year long studio. Students worked with editing programs such as Adobe Premier and Apple Final Cut Pro as well as compositing software such as Discreet Combustion.

Each team was asked to use sound in their film to add spatially to the experience. Sound was used to locate the audience in space. By using 5.1 surround audio, space could be expanded or compressed such as the sound of a storm approaching from behind or footsteps coming from a hallway.

6 Conclusions

Several conclusions can be derived from the work and the process. By changing the evaluative structure the students were accustomed to in their architectural education to a critique based on the narrative intentions of film, they were able to consider more fully how space, form, movement and light participate in the

events or actions that go on in the architecture they were envisioning. Such a critique brought the idea of spatial experience to the foreground. The total experience of the monastery the students designed reached beyond the monadic instances that still images offer—images not related by the cut or edit—to one of immersion in an unfolding of time and space similar to how we experience physically a built work of architecture.



Figure 4. Screen shot of monastery cloister.

The students began to develop their designs in a unique methodology. The design of architecture requires detailed development of even the smallest of concerns such as the texture on a doorknob. It is difficult sometimes for students to go past the broad-brush strokes of a diagram due to the flood of information that must be considered and its often abstract intangibility caused by its presence only on paper or on the screen—knowing that the design will never be realized as a building by the student often makes full development difficult. In this case they began to consider the architecture in great detail because the story and their ideas about the film told them exactly where to put the camera. They knew exactly what was to be seen and what had to be developed and worked out. This allowed for often-substantial changes in the design that would have been missed using conventional notions.

Secondly, an audience not trained in the architectural conventions was able to also participate in the architecture because they were being shown what was not yet built in a language they were very familiar with—the film.

In the end, the process of design and the use of 3D modeling in architecture were reconsidered by using film language to expand the effectiveness of the student's critical thinking and communication to others.

References

GREGORY FLAXMAN, Ed., 2000, *The Brain is the Screen*, University of Minnesota Press. P. 154.

JOSEPH V. MASCELLI, 1965. *The Five C's of Cinematography*, 11–65. See the chapter on camera angles for an excellent description of the different points of view used in film.