Seeing Architecture with a Filmmaker’s Eyes

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Abstract

Where do the methods of architectural communication cross over to other disciplines? As digital tools provide greater opportunities to communicate pre-built design in both space and time, in motion and in video, how should our methods of presentation (and therefore our method of seeing) evolve to meet this need? While filmmaking is a much younger art form than architecture, it is already much wiser with regard to motion-based presentation. If we are to evolve beyond the unsophisticated motion of the average fly-through animation, we need to develop a process of seeing and composing in time that better relates to the way we perceive temporal space. A well-edited film detaches us from the confines of the medium: we do not think about how many cameras are used in a scene if it is filmed (and edited) in a manner that is natural to the way we see and perceive. Where can the filmmaker’s art inform an architecture student’s processes of presentation and design? This paper will discuss ways that filmmaking can be used to inform the process of architectural design and animation with specific examples from the work of our advanced digital media course.
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1 Introduction

Even the least sophisticated animation offers a remarkable opportunity to communicate the dynamic conditions of movement through space. Animation creates new and exciting opportunities for presentation. We can illustrate not only space, but also the dynamic condition of movement through space. The typical fly-through is composed as a single line of motion; the line of sight is perpendicular to the path of travel: the pace of motion is artificially constant. This methodology reflects architects’ naivety with motion-based presentation tools. If we cannot look within to resolve these issues where should we seek wisdom?

In film, the term “scene” refers to the context of a situation. Any one scene may contain several camera views, depending on the dialogue of actors or vantages (objects of interest). In our advanced digital media class we are attempting to evolve student methods of architectural presentation in motion to accommodate a process of architectural filmmaking that de-emphasizes a line of motion in favor of a line of perception. When we turn to look from one side of a room to another, we do not pay equal attention to everything in our field of vision, but rather move from one point of interest to another. Our eyes may see everything between these two conditions, but it is these nodes that define the emphases of our attention. The discipline of filmmaking already recognizes this characteristic of perception. The beauty of filmmaking is that if done well, the motion looks natural. We take for granted that what we see is what we are supposed to see.

2 Dynamic Design Methods 2

The student work illustrated in this paper is primarily representative of Dynamic Design Methods 2, an advanced elective emphasizing 3D modeling, digital video, and interface design. Most of the course projects center around the presentation and description of a building: either a previous studio project or a significant contemporary building. Students spend the first half of the semester developing the model and the latter half of the term developing a film (using Adobe Premiere), an interface application (using Macromedia Director), and a website (using Macromedia Dreamweaver) dedicated to the presentation of the project.

The students have already taken Dynamic Design Methods 1, where they have learned Form•Z and previously developed a small but complex building design. The course is open to architecture students from junior year forward, but most students wait until their senior or thesis year to take the class. The course group is small, up to fifteen students, as limited by the advanced teaching lab facilities. The class meets for only three hours a week, and this time is usually divided between an hour dedicated to the review of current work and two hours dedicated to the introduction of software, concepts and examples.

The students’ first submission is a short, live-action video that they design and develop in groups. Usually, the intense schedule of the course motivates the students to maintain these subgroups for informal discussions and review in between class sessions.

Two stages of development are critical to the success of their film project. First, students must move past thinking of animation as a single camera path and must begin thinking of animation as a sequence of planned vignettes. Second, students must begin thinking of the construct of components requiring direction, structure, and rhythm. This is then further developed by the addition of sound. Some of the most creative solutions have come from students who use sound to give their modeled buildings an indication of context.

3 Watching Movies: A critical method of seeing

At the beginning of the process students are taught how to view a movie (rather than watch a movie), documenting camera changes, recording the focus of the shot, and paying special attention to motion and light. We play each short segment several times over; the first time students watch the movie following the storyline as intended. The subsequent times students are asked to examine the construction of the movie noting specific conditions:

- How is the path of view divided between camera segments?
- How many different camera angles were used in the sequence?
- How did the editor transition between clips of film?
- Where is the subject of the video located within the field of view?
- What is the darkest or lightest place within the field of view?
- How does the soundtrack coincide or contradict the visual condition?
- Where does the director want us to focus our attention?

These clips are taken from both short film media and major motion pictures. Some of the best examples come from movies like Gattaca (Niccol 2001) where the lighting and scale of...
powerful buildings contributes to the ambiance of the movie. This has been particularly effective in nurturing a reconsideration of the potential connectivity between architecture and film.

3.1 Optics: What’s automatic and what’s expected?
After watching several film segments students become aware of issues like depth of field and the distortion of wide-angle lenses. While the student projects are mostly animated it is still important to discuss these and other optical effects. There are several things that are natural to the way we have been taught to see, like depth of field which affects how much of the background is in focus, that are a product of recording through a lens. Depth of field is not automatic when recording digital animation, although like most optical effects it can be simulated. Lens flare is another example: this is a very natural effect when shooting with a lens, but does not occur with a virtual camera. The issue is that sometimes these conditions are natural to the way we expect things to appear. Several animated films, like *A Bug’s Life* (Lasseter and Stanton 2000), are entirely digital but include a lens flare whenever the camera moves in front of the sun because it appears more natural.

3.2 Resources
Atom Films (www.atomfilms.com) offers great opportunities for the students to view short films illustrating varying styles and camera techniques. This website features short animated and live action films. The DVD series *SHORT*, a DVD magazine, is another useful resource. The film *Blue City* (Birdsell 1999) from the sixth volume *SHORT 6 - Insanity* (*SHORT 6 1999*) was used as a case study in the spring 2003 term. This film was produced early in the morning with a very small cast, so the nature of the groups makes the whole project more effective.

4 Learning Digital Video
Because the *Dynamic Design 2* students are expected to learn the digital video software at the same time that they are composing the model for the final film project, the students were assigned a shorter film project. Using the School’s mini-DV camera the students were to record and compose a short video about the School, its people, and surroundings. Students develop this project in four topic groups: the people, the place, the work, and titles/credits. Each group composes its segment individually with a separate soundtrack. The only exchange between the groups occurs during in-class reviews of the work. The group responsible for titles and credits does not have to acquire film content like the other groups, but it ends up with the responsibility of trying to combine the dissimilar parts into some coherent whole.

Since the content is mostly digital stills and digital video the students can spend most of their time on this project learning how to compose and edit the pieces. Typically, one of the three segments is strong and the other two are weaker. Over the last two years the strong groups have finished earliest, giving their classmates a chance to see their work with time to make revisions. Typically, the urge to compete that develops between the groups makes the whole project more effective.

4.1 NTSC and Widescreen– Designing within a module
Digital video, unlike digital still photography, requires a much more consistent approach to frame size. A digital camera can be turned ninety degrees for a vertical composition, but video does not permit the same flexibility. This is particularly true with live action video since the camera one is using prescribes content format. The standard for North American televisions and video cameras is NTSC, or a 4:3 proportion frame. Many digital modeling programs, like Form-Z, have an option to render animation in a standard NTSC window, but one benefit of digital animation is that the designer is not bound to any camera’s proportion system. An animated film can be just as easily composed and rendered in a widescreen frame (16:9) or even in a wider panoramic view (see Figure 1). While Premiere and Final Cut Pro both have workspace settings for the standard video modules you can compose video to a custom size as well. In completing the School video students get a sense of how binding the video frame can be.

4.2 Editing the Clips
Students are shown how to adjust the in-point and out-point of each segment so dead space in a clip need not be contained in the film. They can also use these tools to sub-divide a single animation sequence into a series of individual film captions. This way, for instance, if an animated procession moves through a wall the part before and after the collision can be used without having to view the error in the middle.

4.3 Transitions
We have been teaching students to compose and edit in a two-track (A/B) environment. This arrangement is typically easier for novice users. Video segments are inserted into either the A-track (above) or the B-track (below) with a separate track for transitions.
in between. The two-track layout helps students understand how video segments can be made to flow from one to the next with varying levels of continuity. Where a traditional flythrough is composed of camera moves in a continuous sequence, using a video editor there is the opportunity for blended transitions in concurrence with changes of view angle or subject of focus (Figure 3).

Premiere includes a large selection of transition types. Most of these transitions are very graphic and initially students are overzealous about using these very direct and very graphic flourishes. We go over several in class, but the dialogue of discussion is particularly with regard to where a transition is supposed to make a break between dissimilar parts versus a transition that is intended to weave segments together. Another incidental benefit of the group video project is that students get most of the special effects transitions out of their system.

4.4 Panning and Still Images
Still images can be added to the video tracks as easily as a video segment. The only difference is that a still image has no innate duration. Students are encouraged to include still images in their films. Still images can help slow down the pace of the video composition and emphasize key views or spaces. Often, details of material such as brick coursing, or a detailed texture are not clear in a segment of motion video. These conditions only show up clearly through stills or very slow animation sequences. Another advantage of still images is that they render much more quickly. Still images are useful for filling in segments where an animated sequence may not be complete. They can also be used as placeholders while the movie is being composed.

A dynamic way to use a still image is to pan across a long view. Horizontally, the effect is like scanning across the horizon; only a portion of the whole image is seen at one time. Students are very taken with this tool since it gives a still image the effect of motion.

4.5 Adding Sound
Students learn how to add a music track, typically an mp3 file, to their film. Since there is usually no dialogue in these projects the soundtrack has a significant impact on the rhythm, pace, and transitions of the film. Premiere can accommodate several sound tracks, but most students do not use more than two. Students learn to fade sound in and out: the soundtrack should not start or end too abruptly, or it sounds like an editing mistake.

4.6 Adjusting Speed and Duration
Students have a lot of flexibility as per the speed of individual film segments as the animation segments are not populated. Students are encouraged to align the visual transitions (variable) with the audio transitions (fixed). Despite the use of storyboards the animation sequences are usually not executed specifically for a certain place in the soundtrack. Students are recommended to animate at thirty frames per second: with so many frames a slowed-down sequence can still appear smooth in the final film.

5 Storyboarding – Ordered Strategy
Like drawing the cartoon set of a final presentation, storyboarding is an annotated outline of a time-based composition. While storyboards can be entirely drawn, the students are encouraged to use a drawing with annotation format so they can make notes about the lighting requirements, camera angles, or transition styles to be used along with the sketch of each camera angle.

The storyboard can be used either to document the project camera move by camera move, or scene by scene. We have had the most success introducing students to this process initially as a scene-by-scene (space-by-space) record of where they are going and in what order. This model is very useful with regard to Director applications and web design. In these contexts the storyboard is used to document the relationship between the home page condition and the subsequent chapters or sub-pages of an interface design.

One of the primary lessons when we begin interface design is about creating some consistent organization from one page to another so that the user can follow the navigation system from one page to the next. Storyboarding provides an effective means of helping students to map out both the variable elements of each page (content) versus the constant elements of each page (navigation tools).

With the film projects students begin by developing scene-by-scene storyboards and then, after the basic order is resolved, are asked to break each scene into a series of camera moves. So far we have not had enough time in the project sequence to have students consistently document the camera changes. This more exhaustive method of notation can assist the author in isolating the key vignettes within a progression. Used correctly, students should be less inclined to render long sweeping motions where shorter faded transitions would be more natural. This is also more efficient for production: when they execute their animations
this way the rendering time is usually faster since they are rendering shorter four-second to eight-second segments.

5.1 Planning the Model
While many of the students have already applied Form•Z in their studio work, most have not developed a methodology appropriate to a more detailed presentation of a building. Just as traditional rendering requires forethought as to which areas of the building are to be shown and what level of detail to apply to foreground and background elements of a view, so too detailed modeling should ideally be founded upon a plan of priorities and emphases. The students cannot realistically model the entire building at an equal level of detail. The objective of this planning stage is to determine (as possible):

- What parts of the building are most important and therefore most likely to be shown?
- Where will the building be seen up close and therefore in more detail?
- Where will the building be seen at a scale where textures or material joints are going to be apparent?
- What will only be seen from a middle distance?
- What will only be seen only from a far distance?
- How much of the context is important for understanding the building?
- How abstract or realistic is the model going to be?
- How should the level of realism/abstraction of the model impact the level of realism/abstraction of the context?
- What can be reasonably achieved in the time allotted to the project?
- What is not going to be seen and therefore can be omitted from the model?

If we are modeling in a thoughtful manner the process should permit an opportunity for discovery – for realizing some unseen quality of place that was not apparent via other means. This said, the animator should not preclude the possibility of discovery and therefore adaptation within the scope of the project. On the other hand, without a plan of attack a detailed modeling project can be difficult to fathom and harder to finish.

6 Making the Movies

6.1 Capturing Movement
After documenting the composition of several short films students have begun to see just how short a single camera move can be. Initially they resist this with great effort, composing thirty-five and forty-five second animations that sweep around their buildings at high speed. We critique these in class several times during the term. It only takes one member of the class to catch on, then seeing the effect in one of their own projects, the others begin to follow suit. The work becomes much more sophisticated once they can conceive movement up a flight of stairs or around a corner less as an extended line of motion and more as a series of single movements stitched together with transitions. The fourth frame of the image sequence below (Figure 4) illustrates a change between two camera movements into Louis Kahn’s Exeter Library.

Since the emphasis of the filmmaking process is to create a more natural experience of occupancy, the students are encouraged to place the most emphasis on views that are natural to the inhabitants of the space. More artificial views are expected to serve a specific end, expanding the viewer’s perception of the work. A good example of this is shown below in Figure 5: the student used an unnatural camera angle to illustrate the details of a complex roof system from one of Renzo Piano’s buildings.
6.2 Light
Adequate lighting is essential to the success of the animations. The students spend most of their time on lighting interior spaces. Beyond simply providing enough light, some directionality (i.e., gradient) in the lighting scheme is necessary for surface and depth changes to read properly. This can be more difficult with dark and patterned surfaces. Most students render their final projects in Form•Z. Once they are comfortable with custom lights they use these more frequently. The custom light settings allow for a more directional distribution of light to be defined. These can be less direction than a cone light without being as uniform as a spot light.

In the analysis phase of the course students are asked to look at the color of the light and how this color indicates the difference between natural light and artificial light, or morning versus mid-day light. The students who are most sensitive to these conditions show a much broader range of color in the lighting of their film. A good tool to this effect is Graphisoft Artlantis. Form•Z will write an Artlantis native file. In Artlantis students can create solar studies of their models. These models beautifully represent the movement of the sun along the floor or wall of an interior space. Even more importantly, a morning to evening sun study simulates both the sun’s direction and the sun’s chromatic shift. Even if the students do not elect to use this for their final rendering, witnessing the color change in the short animations appears to inform the range of light colors used in the films.

7 Conclusions
In learning the process and methods of digital filmmaking students discover a valuable tool for both delineating and testing designed space. While we watch the film projects develop in class, the evolution of the students’ thinking is apparent in the evolution of their work. They evolve from composing a path to composing a procession. Moving through these virtual buildings they become more sensitive to how the architecture defines a specific path through a space.

The time they invest building the model is a strong motivation toward lighting the work effectively. Students become more comfortable with the tools, and they recognize light as a device for communicating change – inside to outside, morning to evening. The students show a greater facility for lighting after this project that seems to permeate their subsequent studio work. Students think more specifically about the pace of movement and about ambient sounds in the space while learning to add sound to the projects. The soundtracks change and evolve along with the project reflecting changes in the students’ understanding of how these places can be experienced. The most effective movies usually use jazz, ambient, or classical music behind the imagery. Backed by rock music the films typically move too fast and the end result is often disconnected. If a student does not learn this lesson through their own work they usually reach this conclusion after watching the more successful work of their classmates.
The process of animation presents powerful tools for the presentation and critique of architecture; that this should have a transformative affect on the discipline is clear. A critical dialogue regarding the success and application of this media would be well served by acknowledging the filmmaker’s insight into human perception and the choreography of movement. To be effective with this media we must be willing to acknowledge that the context of architectural movies does not in itself change how people perceive space and motion. By seeking insight from the discipline of filmmaking, we can aspire to a more natural and informed delineation of movement and occupancy in digital space.

References