Rules of Engagement

by Robert Trempe

We live in a world born of accumulation, shaped by deviation. From the DNA in our bodies to the text on pages, our world is understood and articulated through changes (deviations) in field[1] conditions. For example, my eyes are brown. Simple deviations in the repetitious system of DNA cause this. One reason you are able to read this writing is not because of the monolithic nature of text, but because of the repetitious assembly of a series of instances[2] or universals (individual characters) that are carefully crafted and articulated via a latent logic. This logic is instructional in that it provides the basic rules not only for the organization of our bodies and text, but for the articulation of an architectural logic, from initial investigation to turn-key habitation. The propagations (both in terms of the thematic and the instructional) of this investigational system are as follows:

ARCHITECTURE IS INHERENTLY FOUR-DIMENSIONAL

…When there is a change in the basic framework of thought, then there has to be a shift in architecture because this, like other forms of cultural expression, is embedded in the reigning mental paradigms.[3]

Often architecture has been related to other forms of static art such as painting and sculpture, typically in a 1:1 formal relationship. This is by far one of the easiest relationships or analogies to make. However, this is limiting in that architecture must take into account time as a means of articulation. This propagation suggests that architecture is four-dimensional, more akin to music, dance, and film[4] in that architecture takes on spatial, material, and programmatic qualities, all of which employ time as a means of articulation. Materials change over time through issues of usage and age. Spatial conditions within a room change based on the time of day and shifts in light. Even conditions of programmatic usage change on time-based cycles ranging from minutes to hours to days and years through the temporality of usage.

The change in this "framework of thought" requires a change in the "rules" set out to investigate architectural scenarios. If we are to think of architecture as operating in a four-dimensional world, the first step is to understand the intricacies of other time-based forms of media and experiences[5], taking them apart as a method for understanding the logic that makes each work successful. Further, to help in the investigation of time-based media, a simple system of notations called *instances and universals* must be developed as a means of articulating the changes within the field (the whole body of work being analyzed.) Just as the organization of notes (each note is an instance) in a piece of music generates the formal quality of sound, so too can instances applied as agents of articulation in an architectural investigation through the manipulation of instances in a field.


Figure 1: Melissa Chapman-Smith '08: Mapping of the film "The Jacket." Each of the three qualities of time in the film (cinematic time, event time, and historical time) are documented using three Cartesian axis (x, y, and z). The mapping is designed to not only expose qualitative relationships in the three times found in the film, but also to examine how these qualities of time influence the experience of the film through issues of reliance and overlap.
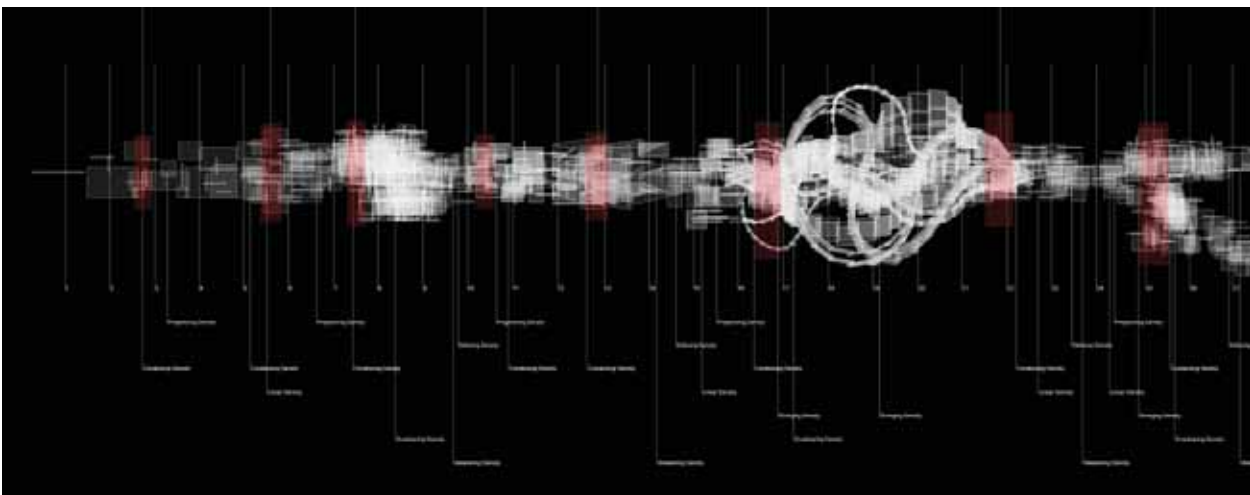
Figure 2: Pawel Ostrowski '08: Mapping of the film "Four Rooms." Through the repetition, orientation, and deviations of a singular element within a field, Pawel's mapping articulates the moods set in each of the four scenes (rooms) of the film as well as the relationships in emotions from room to room.

In the works of Melissa Chapman-Smith '08 (Figure 1) and Pawel Ostrowski '08 (Figures 2, 3) these ideas are manifested in the dissection of film, whereby each film is taken apart as a means of exposing the time-based qualities, notating conditions of qualitative change. In the work of Mark Faulkner '05 (Figure 4), the time-based analytical information comes from comparative changes found in a reoccurring bike-ride taken several times throughout the day. In all of these examples, simple instances are used as the repetitive element of the field condition, marking particular moments of the time-based experience. The gathering, organizing, and connecting of these individual instances operates as referential markers for qualitative shifts in the experience being dissected. This leads to the second provocation.
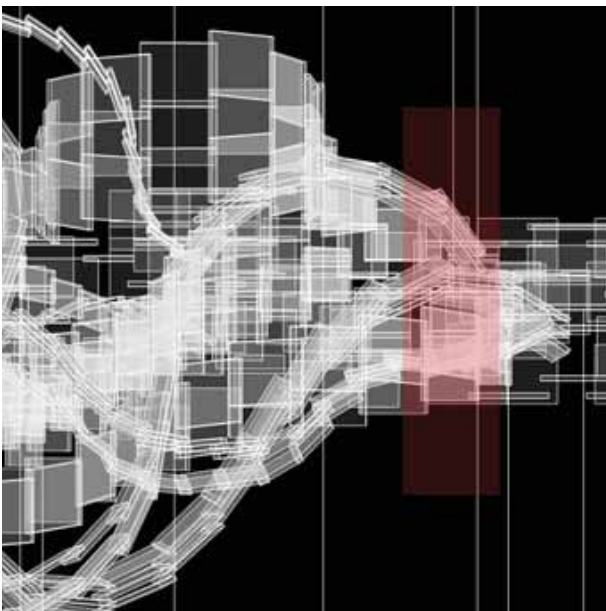

Figure 3: A detail of Pawel Ostrowski's '08 mapping of the qualitative experiences found in the film "Four Rooms."

ARCHITECTURE IS AN ACCUMULATION

Architecture is an organizational accumulation of instances within a period of time or field condition, with the organization forming an event. This idea holds true with any time-based media in that, the manipulation of a single repetitive instance within the field will force a reconfiguration of the networked (accumulated) result. This train of thought can be used in every aspect of an architectural design, from the investigational process (articulation and exploration through techniques such as mapping and diagramming) to architectural construction itself (tectonics are NOT monolithic but are based on the accumulation and organization and articulation of individual members…even concrete is built of bits and pieces.) Within this spirit comes the main rule of investigational communication: For a process-based exploration to notate qualitative shifts within the event, it must be based on the organization and manipulation of a field built of instances as it follows the guidelines that the event is formulated from the instance accumulation. In the end, the construction becomes less about the individual instance and more about the relationship of instances to the whole of the field (Figure 4 Detail).

In analog realms this has been proven over and over. We need only look at the works of artists such as Sol LeWitt or the music of Phillip Glass to see that the accumulation and organization of simple instances (the line for LeWitt and the singular note or musical phrase for Glass) can have a profound effect on the whole. As architects operating in a digital realm, we turn to Digital Assets as a means of simplifying the process of articulating this organization. We must be careful in how these tools are employed though, as to make sure we, the author of the composition, leave our imprint on the work rather than allowing the tool to make the decisions.
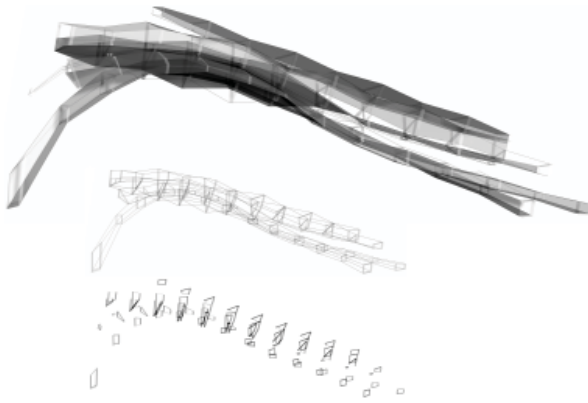
Figure 4: Mark Faulkner '05:
Mapping of multiple bike rides through the same neighborhood at different times of day. Each bike ride was documented through the articulation of a series of rectangular sections with each section notating a moment of time. Modifications to each section were based on qualitative shifts that occurred during that particular moment of the ride. Orientation of each section from the base section notated conditions of positional shifting during the ride (avoidance of other vehicles, pedestrians, etc.) The sections of each ride were then connected together, forming a time extrusion. The end product is a composite of several bike rides, used as a means of notating similar qualitative conditions from ride to ride.
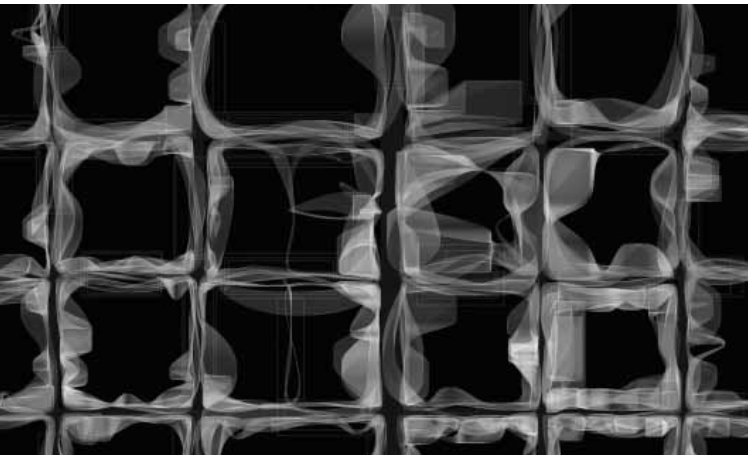
Figure 5: Melissa Chapman-Smith '08:
Using the same techniques (both in terms of modeling and rendering) as well as the same time-based rules from the movie analysis, Melissa generated a study of usage densities within the project site. The criteria used for the movie analysis allowed Melissa to quickly visualize these conditions within the site and helped in unlocking information about changing programmatic usage as well as issues of reliance and overlap.

## THE TOOLS OF FOUR-DIMENSIONAL ARCHITECTURE ARE TOOLS AND SHOULD BE TREATED AS SUCH

It can be put this way too: find ways of using instruments as though they were tools, i.e., so that they leave no traces. That's precisely what our tape-recorders, amplifi-

ers, microphones, loudspeakers, photoelectric cells, etc., are: things to be used which don't necessarily determine the nature of what is done. There are, of course, pitfalls, but so is one's finger when he points to the moon. What we're dealing with is not things but minds. What else?[6]

John Cage's commentary on the tools for music is completely applicable within the rules set forth here. We cannot let the tool generate the result, blindly pressing buttons and using every item in the arsenal until something pretty comes out as, if the tool determines the nature, what control do we the author have? Instead, we must become masters of the tools in order to move beyond the "things" and in turn reach the "minds" of our ideas. Of course, given the amount of toolsets at our disposal, understanding the characteristics of each tool is often not efficient and can lead to conflicting results based more on the accumulation of tools rather than the articulation of an idea. Instead, limiting our manipulations in a digital realm to a handful of key toolsets we have mastered will allow us (the authors) to leave our imprint on the investigation rather than the toolsets controlling and marking the result. In this respect, one or two tools operate on the idea of reduction, one of the quintessential goals of the diagram (and modernism in point of fact) in that articulation comes from refinement and control of fundamental information.

Working with fields is powerful to the author in that the simple manipulation of a field using the most basic of parametric constraints has a more powerful (and even more beautiful) result than the most complex command sets. In the example set earlier (eye color) whereby complexity was generated through the deviations within a massive strand of DNA through the manipulation organization of a singular element, the analogy becomes the fact that a singular tool in the hands of an author can accomplish the same richness of result. In Melissa Chapman-Smith's mapping of site qualities (Figure 5) not only is a singular tool used as a method of articulation (lofting), but the same qualitative methods and quantitative articulations are employed from the previous study of film mapping as a method of not only creating continuity from one study to the next but also as a vehicle for learning every aspect of the tool employed. Through this continuity of quantity and quality we are able to control the result with full knowledge of the impact to the system. This means that we (as the generator of the study) can spend more time articulating the study, with results that clearly operate as a set of instructions toward the articulation of an architectural intervention.

This is not to say that an entire career should be spent working with a singular toolset. Instead, with each passing investigation, we learn more about how a different tool operates, building our skill sets as we move from project to project.
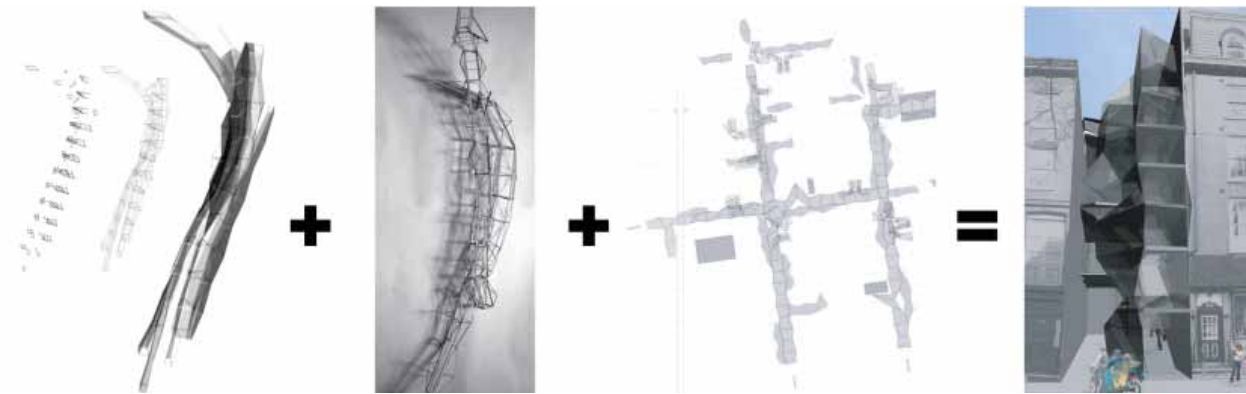
Figure 6: Mark Faulkner '05:
From process to final articulation, it becomes readily apparent through graphical articulation how information from one step of the design process influences each other step along the way, concluding with a final site intervention (at right).

INVESTIGATIONS OPERATE AS THE RULES FOR ARTICULATION

Many school projects operate under the assumption that the sooner the overall building is articulated, the sooner "schemes" can be developed, either through multiple visualized attempts, or a reworking of an existing intervention over and over again. With a process such as working with fields, the hard work of setting up rules and logic is accomplished early on in the investigational process. After developing the conceptual machine (the investigational graphic based in the manipulation of instances within a field), the same ideas are applied to investigations approaching the point of architecture, such as issues of site and program, both articulated through mappings using the same language found present in the initial field studies. The linkages from one set to another may not always be 1:1, but the logic inherent in each study does connect, creating relationships strengthened through the process. This is further fortified as the user moves on to the final articulation of an architectural intervention, using the same qualitative language as a means of crafting the final result.

This process reinforces the idea that information taken from the beginning of an investigation should be critically applied both as a set of rules toward further investigations in an architectural process. In Mark Faulkner's '05 work (Figure 6), the relationships from one step of a design process to the next are clearly notated from the most conceptual of investigations (the analysis of several bike rides through the same location at different times of day) through an analog investigation into body cladding, the mapping of time-based characteristics on site, and finally the intervention into an existing urban fabric. In the work of Melissa Chapman-Smith '08 (Figure 7) the ethereal qualities of time found both in the analysis of film and site are manifested in (an albeit elevationally geometric) mixed-use facility with different programmatic functions continually fluctuating in and out of one another throughout the time cycle of each program. In the work of Pawel Ostrowski '08 (Figure 8) the way in which simple planes

(and their relationship to one another) found in both the film analysis and site mapping notate conditions of usage and change, so too do the planes used to articulate programmatic function in Pawel's final site intervention. In all three examples, the rules for the "final" architecture are established very early on in the design process, making the process of articulating the ideas that much easier as all the author must do is look back on the previous investigation to organize a design. In all of the examples, the rules set forth early on in the design process influence every decision made by the user, in some cases through formal articulation, while in other cases through linkages in the qualitative information from conceptual information to programmatic and spatial organization.
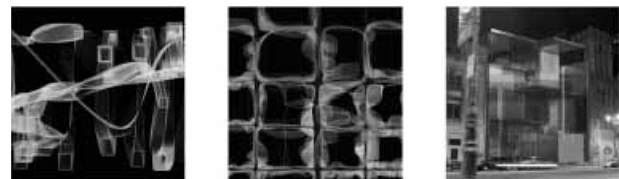
Figure 7: Melissa Chapman-Smith '08: From left to right - Time-based media analysis, Site Mapping, and Final site intervention.

SUMMARY OF PROPAGATIONS

It should be noted that the propagations elaborated on are by no means the only method for exploring architectures potentiality. Having said this, the methodology described has countless potential as a system of procedural evolution, ultimately resulting in new and unseen architectural interventions. In an academic setting where we are pushing students (and professionals) to understand the role of process, critical thought, and critical articulation, the "rules of engagement" described above allow for the development of clear train of thought and communication of idea in every level of architectural processes, and these rules become one more "part" in what should be an ever expanding "kit" of process.

NOTES

[1] In this article, a field will refer to an organization of repetitious elements within a well defined space.

[2] The term "instances" has many identities, each based on the context to which the instance is associated. In music (for example) an instance might refer to a singular note on a musical staff or voice within a group. In architecture, an instance is defined dependent upon its function. In mapping, an instance refers to the individual character or symbol deployed into a field while in construction an instance can be referred to as the singular 2x4 of a roofing system.

[3] Maggie Toy, *New Science = New Architecture* (London: Academy Press, 1997).

[4] For this writing, music, dance, and film have been chosen as analogies as they can be thought of under the same "creative" umbrella as painting and sculpture. As people have made relationships in the past between architecture and painting/sculpture, it is hoped the same relationships can be made now through other time-based creative media.

[5] In an earlier version of the studio for which these propagations were applied, time-based experiences operated as the initial graphical inquiry, with each student taking apart a daily experience of mobility (from the phone to the bike) as a means of understanding how the mobile device modified a time-based experience.

[6] John Cage, *A Year From Monday* (Middletown, Wesleyan University Press, 1963), 124.

REFERENCES

Cage, John. *A Year From Monday.* Middletown: Wesleyan University Press, 1963.

Toy, Maggie, ed. *New Science = New Architecture*. London: Academy Additions, 1997
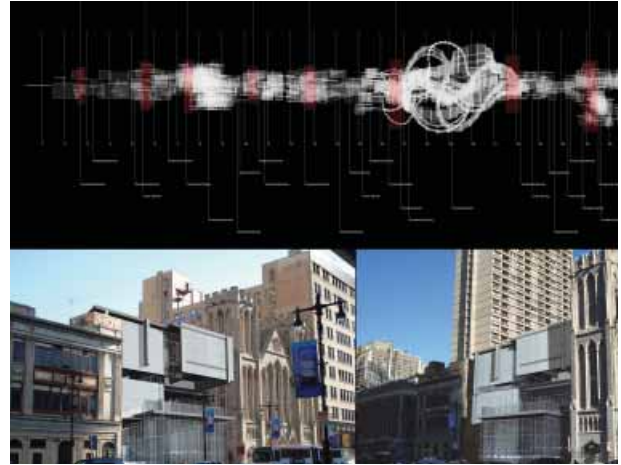
Figure 8: Pawel Ostrowski '08: From top to bottom – Time-based media analysis of the film "Four Rooms" and two street elevations of the final site intervention. While the intervention does not take on the formal characteristics of the media analysis in a 1:1 manner, it does use the logic of the planes and what these instances notate as a set of instructions for the relationships of programmatic overlap and skin.

Figure 9: Melissa Shilling '06: From left to right – Time-based analysis of a phone conversation with Melissa's sister during a hurricane, the final site intervention in elevation, and the final site intervention in perspective. The time-based analysis notates the power of the mobile device through moments of conversational displacement whereby Melissa felt as if she was in fact experiencing the hurricane with her sister. This issue displacement (as well as detachment) became the overwhelming logic for her site intervention both in terms of formal and programmatic qualities.

Bob Trempe is a designer and professor focusing on the instructional logic of repetitious systems. This research includes experiments with field manipulations, digital planer fabrication techniques, animation and mapping techniques, and theoretical papers. His research can be seen both his conceptual work through his office dis-section as well as professional work with the design office of Verspoor & Trempe. Speculative projects such as "Universal: The Superstructure of Skin" can be seen in the 2004 Birkhauser book "Diversifying Digital Architecture." Bob has been a semi-finalist in the 2003, 2004, and 2005 FEIDAD (Far Eastern International Digital Architectural Design) competition, the "Radical Radiator of the Future" competition, and the MACEF Breakfastware competition. His work has been shown in various galleries including the 2007 ACM/SIGGRAPH Electronic Arts Gallery. While in school Bob was a two-time winner of the Samuel K Schneidman Fellowship from the University of Pennsylvania as well as the Melhorn Scholarship for Architectural Theory. Bob was also a year 2000 Dales Traveling Fellow. Bob has taught at The University of Pennsylvania, Philadelphia University, and is currently an Assistant Professor of Architecture at the Tyler School of Art, Temple University.