INTRODUCTORY DIGITAL DESIGN SEMINAR:
Thinking and Making

by Mark Ramirez and Carl Lostritto

"The purpose of architectural education – as of all education – is not alone to train a student for professional occupation, but is above all to stimulate his [or her] spiritual growth, to develop his intellectual faculties and to enable him [or her] to grasp the nature and meaning of architecture. Any educational program of a school of architecture cannot be based on the mechanics of the professional occupation but only on the intellectual content of architecture. Our obligations to our students are two: 1. To enable him [or her] through education to develop his [or her] powers of selection by the exercise of judgment. 2. To Equip him [or her] with the skills and knowledge necessary for the practice of his [or her] profession.
—***Colin Rowe***

Introduction

In an attempt to counter the training oriented model of digital media instruction and fuse into it aspects of craft and critical thinking, an introductory course in Digital Media can apply a Design Seminar methodology. This pedagogy allows for the exploration of a multitude of different software, both 2D and 3D, all within the context and use in the design process. The goal of an exercise is not to design an object or layout and then ask students simply reproduce the object digitally but to let the software inform—yet not control—the design process. In this approach the software is agnostic, not significantly influencing or biasing the student in any particular way. By disconnecting the course exercises from typical building programs the students are free to experiment with ideas and concepts that might not normally be available to them due to architectural biases inherent to the studio environment.

Within the context of any design education environment, introductory courses associated with digital media often experience a particular challenge. As a survey course they tend to focus exclusively on the training of a specific piece of software, structured around a series of assignments that ask the students to create a specific given model or three dimensional form. The success of the student is measured by how accurately the task is accomplished. Each successive exercise builds on the previous exercise, introducing a new skill or software functionality along the way. After this linear process and at the end of the term, the student theoretically acquired enough of an understanding of the software so that they can apply it in their next studio or design project.
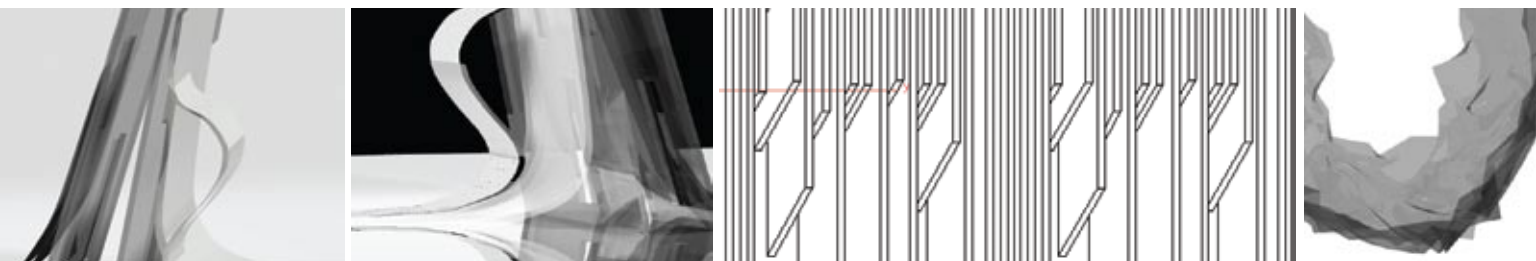

Figure 1: Mozhdeh Matin. Midterm Project Process.

midterm project

Mozhdeh Matin

Sheri Fabian

Ina Kovacheva

Beret Dickson

Jimena Amaral

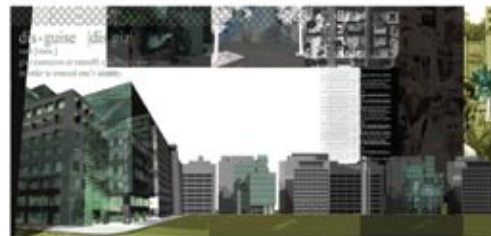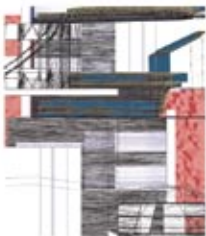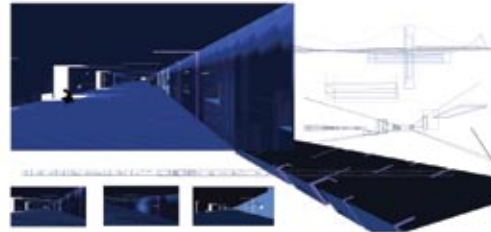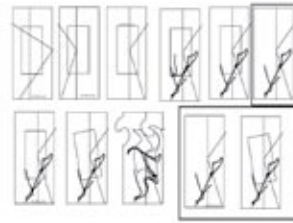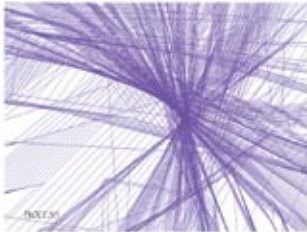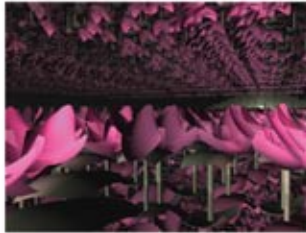Provide a visual catalog or matrix of the given personal information.

Reinterpret the idea of a Triptych. Each "pane" of the triptych must express a concept or an idea from the readings.

Based upon interpretation of the assigned reading, generate a series of conceptual and architectural models of the space.

Figure 2: Student-Project Matrix.

final project

Create a series of 3D diagrams that document the process of a recent modeling or design endeavor.

Create a series of logos that represent this set of ideas.Or, maniplate the enviornemntal or perceptual context of a model to communicte a new concept or narative.

Question how a constructed process can enliven design given explicitly architectural parameters.

Unfortunately, this linear or training methodology for learning is more akin to the standard tutorial found with "off the shelf" software. No matter how energetic the instructor, the student body generally is passive and not engaged fully in their own education. Retention of the learned skills also comes into question, particularly since the students do not have any personal associations with the software when they try to use at a later date.

While software tutorials certainly have their place and they can be useful for individuals, this model applied in a design curriculum does a disservice to the student. Lost is an opportunity to discover how digital media can be used in a normal design process as well as an understanding of the benefits/pitfalls of digital tools as compared to a traditional analog or a hand drawing process. While the traditional methodology may be acceptable for a student simply interested in the production value of a particular piece of software it falls short for those where design education is the primary goal.

By contrast the focus of design studio is on craft/making, where exploration and discovery is at the root of the course pedagogy. While training on how best to draw a line or the proper way to make a plaster model may be a topic of discussion it is not of primary importance in the greater studio education. By the same token, rigorous intellectual debate and critical thinking often become prey to the time constraints of a project and when production of a model or drawing takes precedence over discovery.

Course Description

The intent of the course is to introduce students to the design potential of digital media within the discipline of architecture. The course exposes the student to the principles and fundamentals of computer aided design through inquiries into digital modeling and visualization. The core of the class is structured around weekly design exercises as well as two larger scale projects. Following each exercise, or at critical points in the project, the students present their work in the form of pin-ups or digital presentations. The majority of the critique comes from the other students in the class with the faculty only guiding the discussion. The purpose is to help the student develop a critical eye toward digital design, whether it in their work or their fellow students. Short lectures, demonstrations, and in class presentations supplement the design discussions giving exposure to technical and theoretical issues.

Fundamental to the course methodology is the premise that the students will learn the software themselves. The aforementioned demonstrations are both short in duration (15-20 minutes) and broad in scope. It is expected of the students that they will then go back, after class hours, and explore additional or more complex functionality on their own.

As this methodology is at times in conflict with their previous scholastic experience or current expectations, many times students ask (or complain) that not enough class time is given to demonstrations of the software and that the time required for the design components prohibit the full exploration of the software. This gives opportunity to discuss the greater issue about the nature of software in the context of a student's education.

Software is ever changing, sometimes through slow evolutionary growth in functionality/capabilities or at other times through revolutionary change where new paradigm for working with digital media is uncovered. Depending on a student's career path, they may find that their chosen discipline may favor a particular 3D software over another. Software is often a victim of fashions or trends, where one is in favor now, while in a few years another becomes the preferred choice. In the context of this constant change, it can be counter-productive for design students to learn all the complexities of a specific piece of software as it may not be what they will need in their future careers. To counter this approach, the students are asked to develop a process by which, at any time, they can learn how to

Figure 3: Beret Dickson. Exercise 7.

use and manipulate a new piece of software, on their own and with minimal exposure. In a sense, they learn how to learn.

It is important to note that the typical composition of the course consists of students in the second semester of their junior year or above. As a digital survey course there is no other technical or course prerequisite. Most of the students start the class with either limited or no experience with digital media. A typical class consists of a mix of juniors, seniors and second year graduate students.

The challenge for this course is to provide an environment rich in design opportunities and discussion yet one that did not compete with their typical design studios. As typical studios include two projects over the course of an entire semester and tend to focus on strictly architectural programs, the design exercises are much shorter in duration and generally independent of each other. They are conceived as short "design bombs" that run the course of the week, and allow for immediate feedback to the student. Each exercise is purposely disconnected from each subsequent exercise, so that if a student failed to generate a successful result with one assignment, their frustration does not necessarily carry on to the next. In short, they have a fresh start every week. The primary goal is to give the students as many independent design opportunities as possible. To supplement this and at critical points within the course of the semester, even shorter "Quickfire" design challenges are given. They last anywhere from five to 20 minutes and ask the student to interpret an idea from a particular topic or discussion from the week and then present it with one of the newly acquired software skills.

Also as a supplement to the software demonstrations, the students are often presented with a series of images and asked to evaluate them. This might take the form of 20 images of Picasso paintings. The paintings selected include both successful and unsuccessful studies. Another example is to present the students with a series of images from projects from the previous semester. In all cases, the goal is the same, to test the student's ability to see and make judgments about the quality or success of the image presented.

Student Examples

The work of two students, Jimena Amaral (Bachelor of Science in Architecture, 2007) and Beret Dickson (Master of Architecture, 2008) is featured here as two representative examples of successful execution of exercises and projects throughout the course. The work of these and other students is presented sequentially with exercises conducted in the first two weeks of the course through and including the final project, completed in week 14 in Figure 2.

Amaral entered the course at one of two typical curricular levels. As an experienced design student in her final year of undergraduate education she began the course
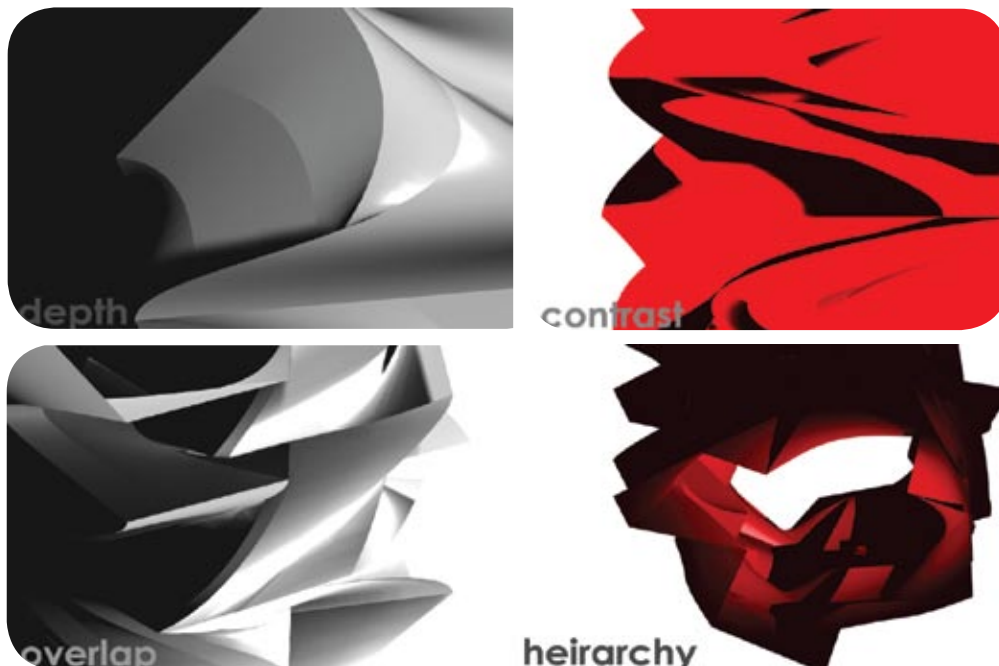

Figure 4: Mozdeh Matin. Exercise 8.

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Figure 5: Jimena Amaral. Exercise 1.

Figure 6: Jimena Amaral. Exercise 2.

with a high level of design knowledge and skill compared relatively to her facility with digital media. The early exercises allowed her and other students with similar backgrounds to leverage compositional instincts in an environment that contrasts pragmatically driven architectural projects. Few students make the transition as immediately. Some intellectually advanced students struggle with strictly graphic parameters. Even then, a common architectural vocabulary at least allows for a level of communication during discussions. The evolution from narrow understanding of architectural issues into a broad and fundamental ability to manipulate, explore, distort and communicate those same issues in varied contexts is the eventual goal.

In these early exercises (the first two columns of the student work matrix, Figures 5 and 6) are explorations in 2D media. As such, the procedural instruction is minimal, allowing weight to be placed on craft, vocabulary and technique. During its presentation, discussions regarding the work set the tone for the course with an emphasis on experimentations with media rather than usability of software. Besides their function pedagogically, these exercises lay the necessary foundation for a later in-depth series of course-wide conversations on modeling craft. A command of graphic methods is essential to an implementation of descriptive geometry. In addition, manipulation of the printed image is a necessary step in moving from digital to physical models in a cyclical digital-physical design process.
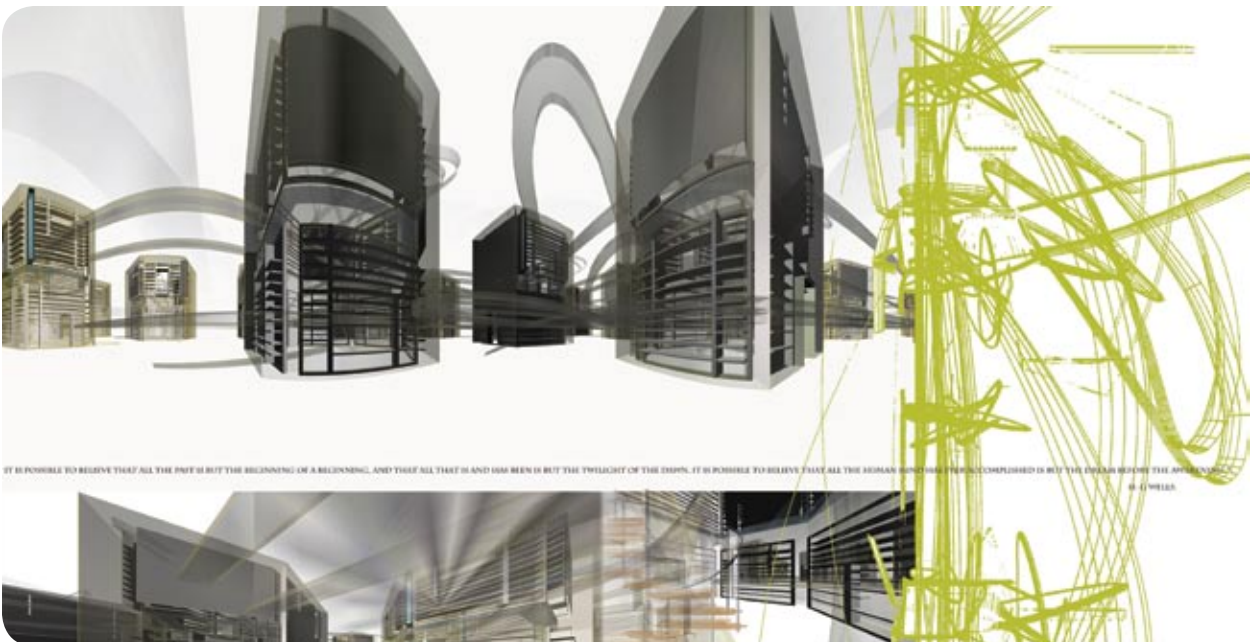

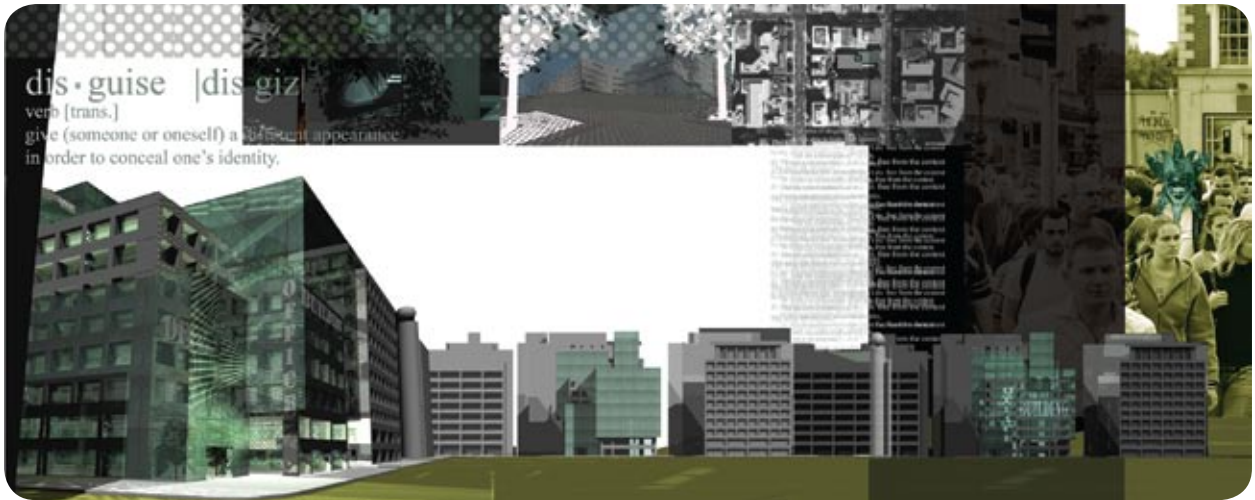**Figure 7:** Jimena Amaral. Midterm Project.
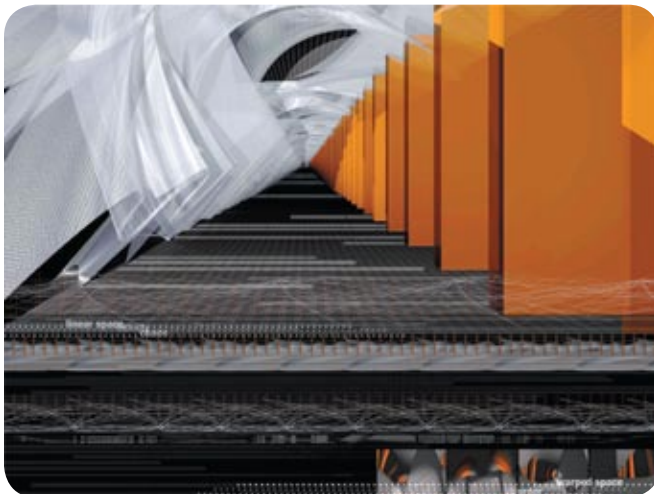
Figure 8: Jimena Amaral. Final Project.

Figure 9: Beret Dickson. Midterm Project.

In the 2D exercises Amaral revealed a comfort with layering, color and patterning as compositional devices. The parameters given to the students mandate little more than an explicit clarity of information. The agenda is the expectation of a reasoned intent by the designer, clarified in and by the product. This agenda persists throughout the course and is evident in that there is as much, if not more, similarity across rows (corresponding to the students) of the student-work matrix as there is along the columns (corresponding to the projects). The success of the two compositions cannot be labeled as such because the parameters were achieved to a high degree. In fact, in these exercises, the binary parameters leave so little to subjective interpretation as to negate the value of subsequent "successful" responses. The requirements are as
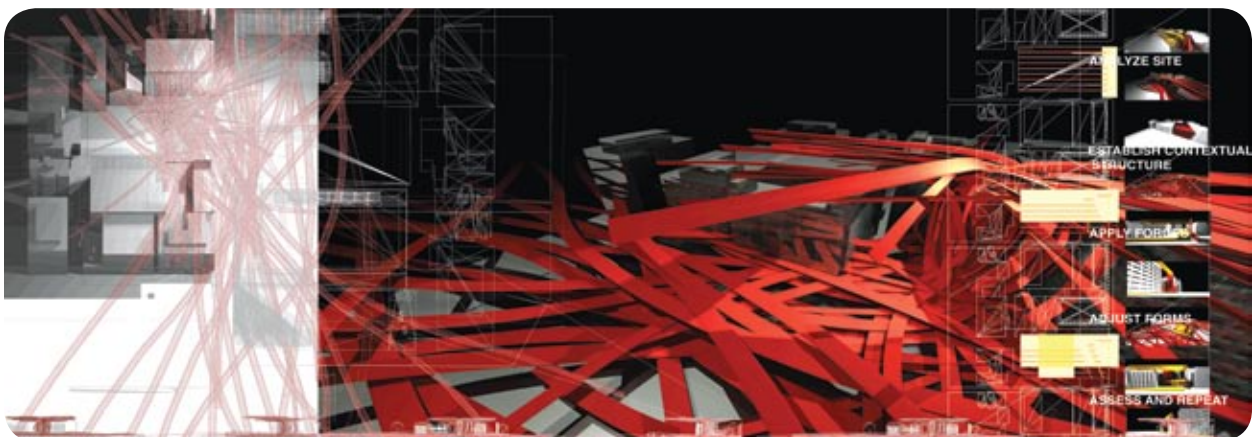

Figure 10: Beret Dickson. Final Project.

basic as including information within the composition. Information cannot be more or less included. Amaral's work is successful because her intent, to create ambiguity of depth using highly contrasting figures amongst shifting frames. These two digital collages strike a balance between a flat composition and perceived space projected into that composition. These conditions and others would continue—sometimes persistently, other times dropping off and reappearing—throughout the course.

In her first project (Figure 7) Amaral translates some intent and aesthetics to an extended endeavor, the midterm project. At this point in the course digital modeling has become the primary focus. This project tasks the student with spatially conceiving a work of fiction (the specific work varied from semester to semester but included authors such as Jorge Luis Borges and Italo Calvino). In this case the intent is the realm left open to the student by nature of using subjective poetic language as the primary content generator. It is not important for the student to romanticize the selection process of the work itself, but rather rigorously articulate and execute her defined process for translating between media. In this case prose referencing dancing corridors and infinitely weaving connections to and from simultaneously central and peripheral nodes—an almost paradoxical point of departure—was translated first to a series of gestural sketches to best capture the loosely repetitive web. These lines and forms are re-digitized and manifest as forms and lines in space. Pulling from her early exercises, Amaral translated ambiguity of frame and figure into ambiguity of line and form in the construction of a spatial experience. The seemingly boundless environment is revealed by the position of the camera and extreme field of view in the primary graphic. Somewhat dimensionally apparent conditions are juxtaposed against fantastically impossible forms and the abstraction of void that is the white page. At the periphery, objective representations blend with the experiential to collage into the final product. As in her early exercises, contrasting

aesthetics blur with each other to achieve compositional and spatial effects. The fundamental 2D exercises allowed for a situation in which digital modeling could be in service to the designed image rather than the converse: a static image capturing, as a simulated photograph or other conventional representation, the model. Amaral took advantage of the ability for this project to become a culmination of architectural issues while still maintaining aphysical formal and geometric gestures.

At the midterm, the mandate for the use of a digital model to achieve the end product is explicit in its existence but is open in terms of how it is used. This gives some room for students to experiment with the software with little risk as their graphic manipulation skills can provide leverage, if necessary. The exercises after the midterm set the table for a final project that demands the issues students have explored be placed within an architectural context. Students are exposed to surface, solid, additive and subtractive modeling techniques in some depth. Discussions and lectures center around the meaning and value of each. Amaral explored texture, patterning and materiality as a digital surface while modeling for these exercises. Her final project (Figure 8) successfully maintains the primacy of concept as the focus given more traditionally architectural requirements of a site and program.

A parallel final project, completed with the same given site and program with the same level of architectural implication is designed by Beret Dickson (Figure 9), a first year graduate student in his second semester of architectural education. More physical in its representation than Amaral's project, this work is less plausible as a constructible proposal. This work expresses an issue that arises in various ways throughout the course: to what extent can digital modeling promote a non-linear design process? How can media and software help reject a singular notion of architectural development
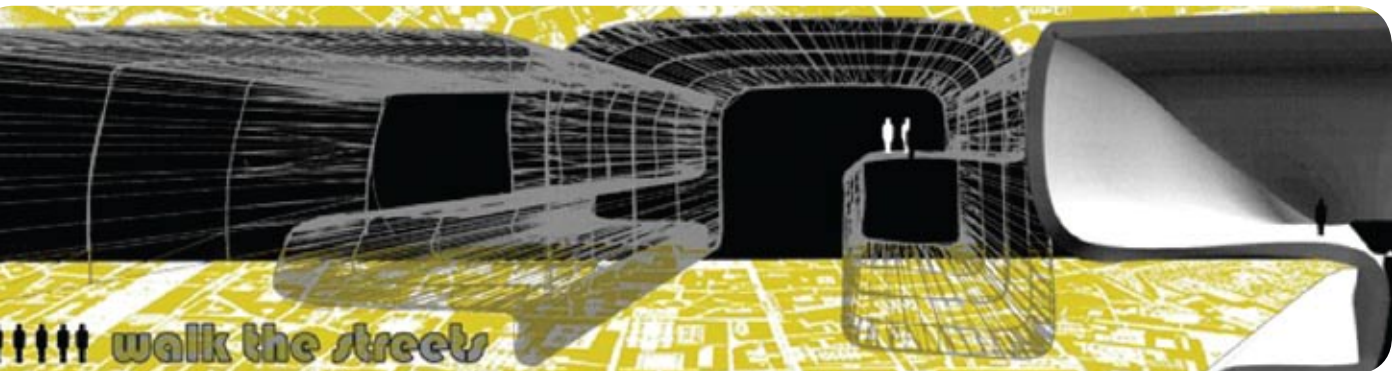

Figure 11: Kevin Blusewicz. Hybrid.

from preconceived, predefined formal abstraction into articulated architectural form (with increasing and gradual focus on the more detailed scale)? Dickson began exploring this issue from the early exercises through his focus on the relationship between a user controlled part to a digitally distorted whole. His work throughout the semester regularly represents an articulation of a process rather than a product. In the early exercises it was the conglomeration of non-hierarchal content, patterned or overlapped to create a coherent whole. Later, Dickson began to explore and control emergent effects grown out of parametric variation. His two projects (Figures 9 and 10) document an algorithmic manipulation of form and space in a way that is ironic in its absurdly physical representation as it proposes not a single formal structure but a reasoned approach for distorting conventional form.

Conclusion

This work is proof that digital media is not a tool, but rather a means to explore architectural issues from the most abstract topological concepts to the literal building. As a design seminar, this course seeks to initiate a series of experiments, with concepts proposed and tested. Never do these experiment result in anything close to a building proposal, as might occur in a studio setting. The projects however, directly propose a physical, spatial attitude about a site and program with digital media.

References

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Course Readings

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Pattern Recognition: By William Gibson
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Invisible Cities: Italo Calvino. Publisher: Vintage Classics (1997) ISBN-10: 0099429837, ISBN-13: 978-0099429838.

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Course Software

AutoDesSys **form•Z**, Adobe Photoshop, Adobe InDesign, Adobe Illustrator, Google SketchUp.

Mark Ramirez is a founding principal of Square 134 Architects, a Washington DC based firm specializing in mixed-use, office, and multi-family residential design. For the past three years he has been a Lecturer at the University of Maryland School of Architecture, where he has taught several courses including Architectural Design Studio and a seminar focused Introduction to Digital Media and Architectural Representation. He is a graduate of Virginia Tech where he holds both a Bachelor of Architecture and a Master of Architecture degree. While working on his Masters, Mark spent nearly two years living and studying in Virginia Tech's European Studies Center, located in the Ticino region of Switzerland. During this time, he traveled extensively throughout Europe studying construction techniques and the effect new technological models of thought have on Architectural design. He is recognized by clients, engineers and contractors in the industry for his design portfolio, project management skills and strong technical background. He is devoted to striking the balance between design, technical detailing, and the construction process.

For **Carl Lostritto**'s biographical note see page 26.