

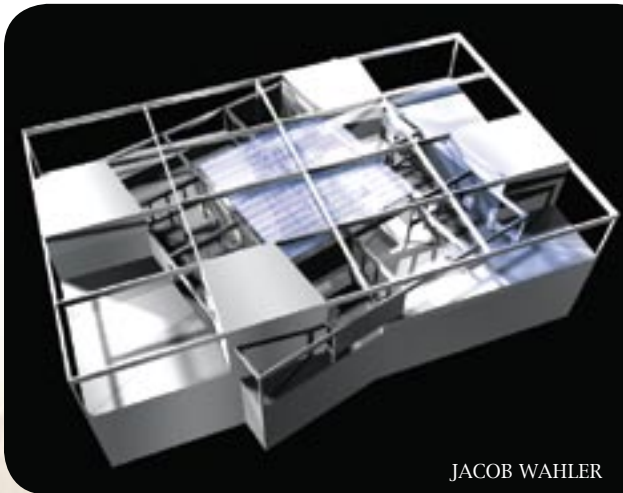
Digital/Analogue Methodologies: Integration and Abstraction

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There are two classes of several that I instructed at the University of Texas at Arlington's (UTA) School of Architecture where I employed a strategy of Digital Methodology development to design process-based Spatial Constructs. Each class was approached differently, considering the students' level of exposure to design principles. These were an Advanced Computer Applications Class, which was an upper division course taken by both graduate and upper level undergraduate architecture students,

design? There was no question for me that at this level, advanced computer application meant the "advanced application of computing" as opposed to the advanced tooling of application functions. The sophomore architectural design studio is an environment where skill acquisition and design concepts work hand in hand. This was the ideal environment to introduce theoretical applications of technology and demonstrate its relevance to basic design principles. By this point, most students have had some degree of

traditional hand generated methods to digital methods? Not really, in an age where technology dominates the design professions, the integration of digital methods with traditional ones becomes even more critical to introduce at early stages in architectural design. This entails an intimate familiarity with the technology on the part of the instructor in addition to design knowledge. The alternative is a linear mode of step by step instruction, sketching, drawing, and digital. The future really lies with those that understand the value of



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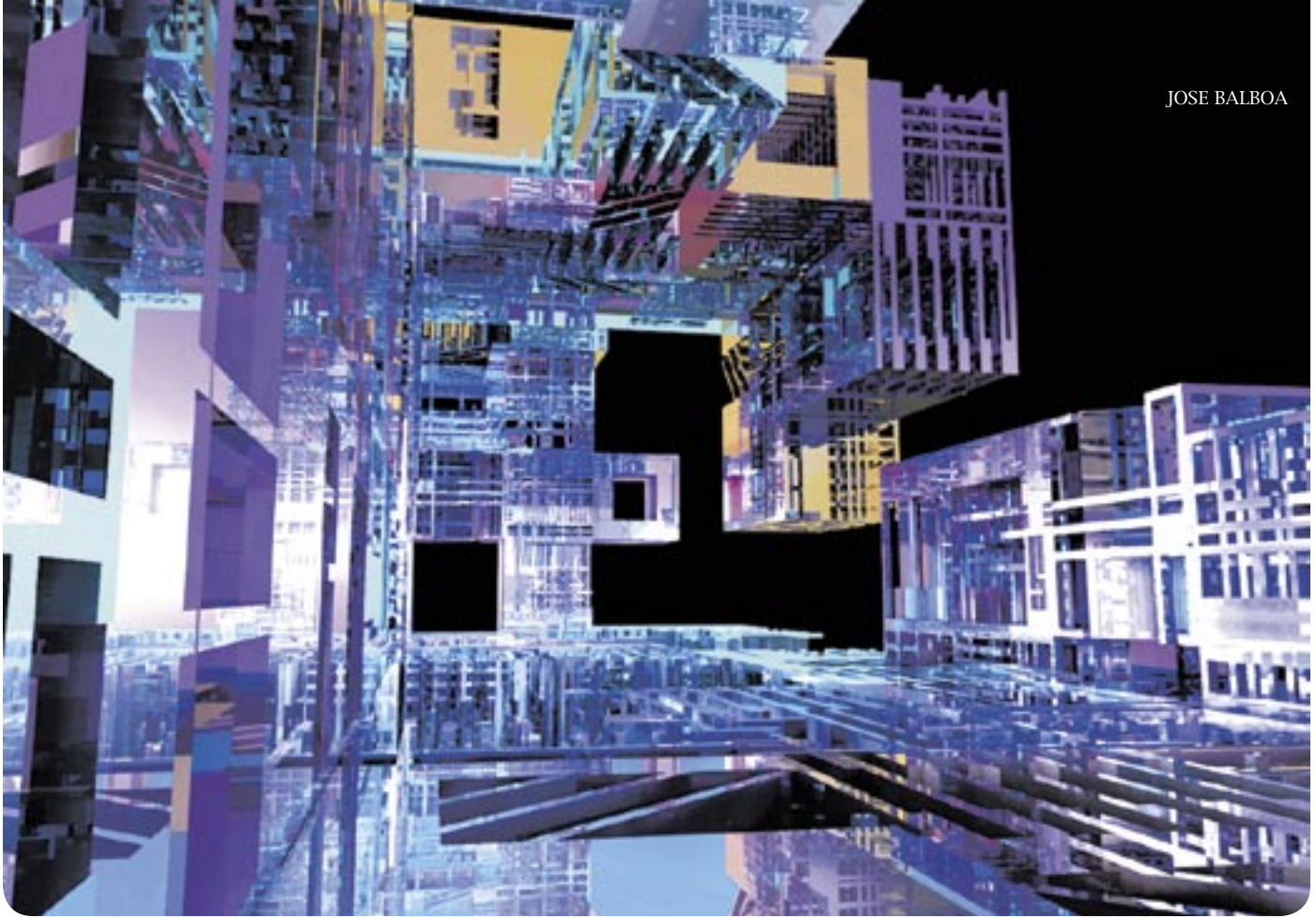
MARIA FERNANDEZ

and a sophomore architectural design studio. The upper division class was conducted during a short compressed and intensive mid-semester term between long sessions. One of the premises of the class was to question the notion of a skills based, (software training), class in the context of upper division architectural design students. Was it appropriate to simply teach the tools at this level to be applied at a later date in another design environment, or should the learning of the tools become integral to the application in

software exposure in the secondary and elementary school system with no real theoretical conception of the potential as a generative design tool. In the setting of a fundamental design class, the importance of understanding emergent technologies as a design instrument, developing both digital and analogue spatial design methods, and learning the strengths and weaknesses of the two was of paramount concern. Should students learn traditional methods of design by hand first? Is there a linear mode of teaching design from

each and can truly integrate them in a non-linear fashion. In both classes, an experimental attitude towards evolving technologies was considered taking into account the differing levels of design knowledge.

The separation of digital skill attainment and the broader issues of "application" as a design instrument cause a schism in the minds of students attempting to understand the value of the device. Learning how to construct objects and render them in



a design deficient environment begins to establish a separation of the device from its true potential as a design apparatus. The strategy of creating photo-realistic graphics of recognizable and familiar pre-conceived “realistic” environments leaves a large gap for the exploratory nature of digital design. Interestingly, a common link between many of the **form-Z** Joint Study Principal Investigators seems to be leveraging the abstract and experimental nature of the software. Arguably, it is the software’s sensibility towards the generation of abstract elements and usability that aids in the discovery process. The integration of design and skill attainment is an essential part of closing the gap between accepting what a program does versus rapid synthesis of program functions and creative manipulation of software to achieve design objectives.

The abandonment of the abstract nature of 3D modeling software misses the potential of the tool as being a new environment that can inform our perceptions and preconceptions of design. Computing and architectural design have moved exponentially away

from simply a graphic representational and/or documentation tool. It has become a laboratory where serious conscientious design explorations can be conducted and physically manifested through rapid prototyping techniques. The sophistication of certain software has afforded architects and academics the ability to develop new approaches and methods for conceiving of architectural designs. The evolution of the computer as a generative, analytical, experimental, and conceptual design device has called into question the methods of pre-information age architectural design. This has caused a rift between those who understand and embrace this technology and those that still remain unaware or unconvinced of its design value. There is no question that there are strengths to freehand sketching and it is a skill that needs to be continued in the architectural education process. On the other hand, the postponement of basic digital design at early stages of a design education is an error equally as grave as postponing sketching till a later date. This is a linear segregated mode of thinking. An integrated strategy

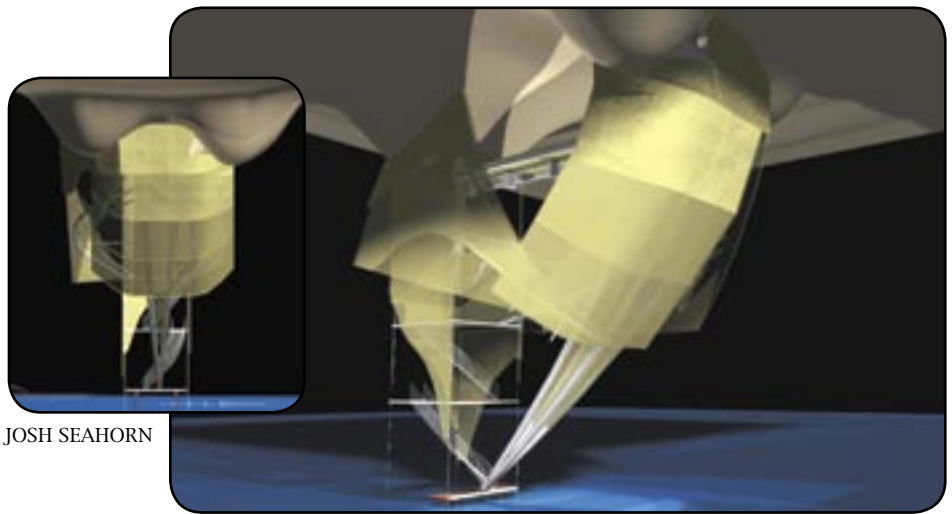
incorporates basic concepts from both digital and analogue methods and blurs the distinction between the two. The notion that computer design is simply a skill that should and could be quickly acquired to then be leveraged at a later date is what causes disconnect between the potential of the device and the superficial development of graphic technique. Having stated this, some architectural digital classes at the university level are still run as simply software training classes, with no connections to design processes or the theoretical nature of different program types. The true integration of technology and traditional design techniques to leverage the strengths of each should be an integrated and not segregated process.

Distinguishing between a well rendered image and a well conceived design might be part of the confusion. Being able to distinguish between an unexpected turn of events, or a discovery, and thoughtless digital noise becomes a necessary ability for educators to develop. This can only be achieved through experience and familiarity

with the technology, developing a comfort level with the rapid pace of change, and keeping up with new developments. The ethics of design, or rather intent, also has a hand in thoughtful, intellectual investigations. The “happening” still has relevance in the digital realm. It’s when the entire project becomes a “mishap-pening” that issues arise. In design schools, distinguishing between the two is easily done irrespective of the way a design is generated. Good design is just that, and being able to guide a student through the abstract world of computing, grasp the nature of the tool, and discover its relevance in contributing to a design process becomes the responsibility of a well informed and technically proficient design instructor. The era

of the technology person training students and technically deficient design instructors is rapidly coming to a close. The separation of a digital and traditional design professional’s methods is a thing of the past. A seamless, integrated hybridizing of digital and traditional design skills is the future of architectural design schools and those that are technically deficient will be relegated to working within the confines of pre-information age methods.

Is there software that lends itself to rapid acquisition, sophisticated components for researching broad architectural design topics and, like sketching, provides an environment for cognitive reasoning and spatial perception skills development? Of course there is, there is a bounty of programs available. There are many categories of software that lend themselves to different types of explorations. Software can be broken down into Program Genres, from



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surface and solid modelers to animators and interactive environments, to simple raster based imagery to mention a few. **form-Z** happens to be an extremely

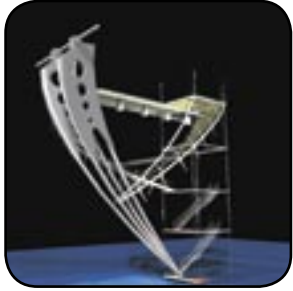
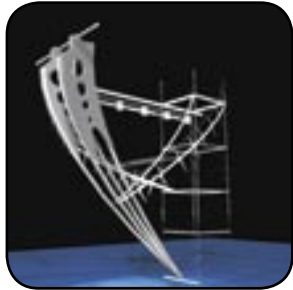
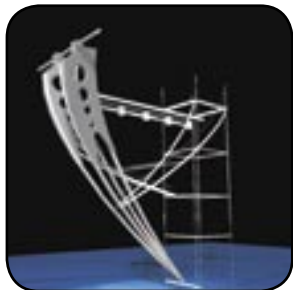
strong modeling program with advanced transformation tools which lends itself to architectural design explorations. It is the 3D modeling software of choice for my Advanced Computer Applications Classes and Design Studios. In addition to tremendous modeling capabilities at both accurate and sketchy levels, **form-Z** has a good rendering engine, superior navigation tools, and fair animation abilities. Many who understand the intuitive and exploratory nature of the program are eagerly awaiting the Dynamic Animation Component to **form-Z**, which will lend itself to further explorations.

The Advanced Computer Applications Class was conducted between long sessions. These “mini-mesters” are brief 3 week courses that lend themselves to intensive vignette type design assignments conducted using digital media.

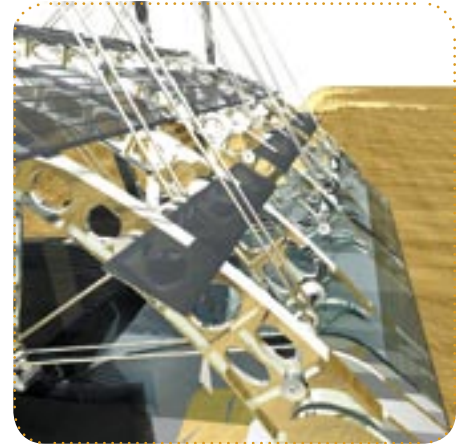
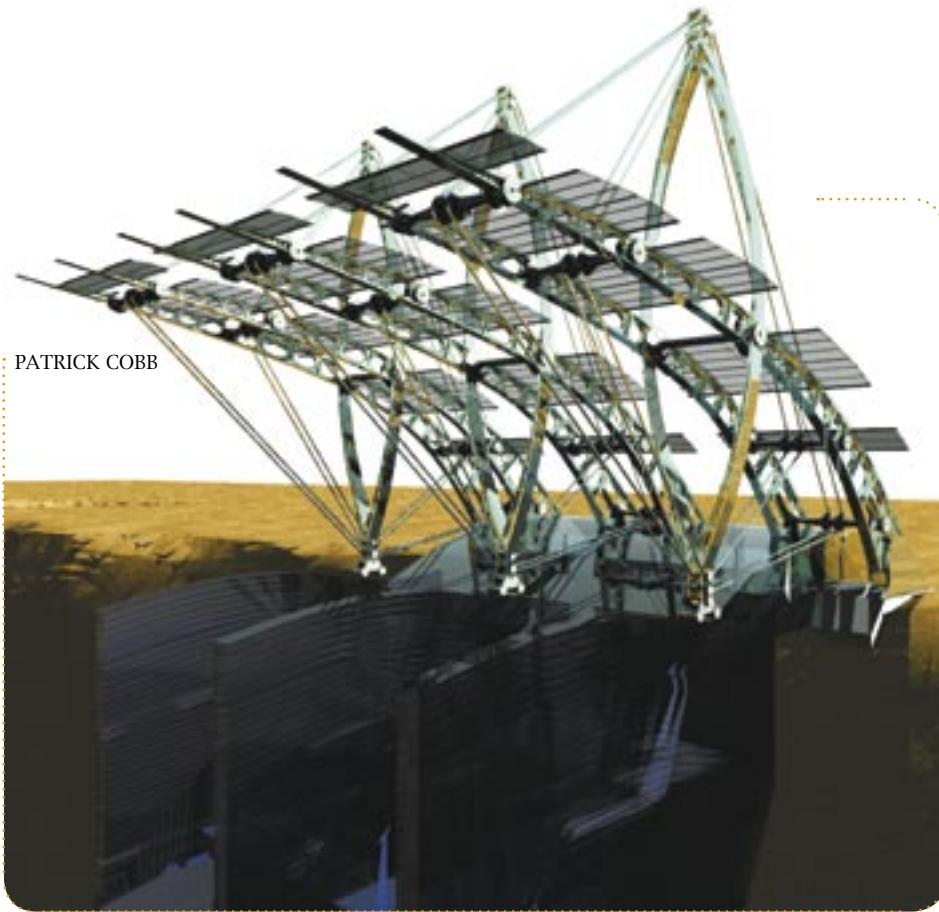
I call it “Digital Design Boot-Camp.” The premise of the class is to explore design possibilities in the computer and conceptualize it as a forceful design instrument if wielded properly. Students are expected to have a general knowledge of computing but not necessarily have any experience using the software. The rapid acquisition of the skill sets through design vignettes was needed to run refined conceptual exercises and was paramount to the success of this type of class. The level of sophistication in the work produced in this compressed class is impressive considering the collapsing of skill attainment and conceptual jumps that needed to be made by the students in a short period of time.

The Sophomore Architectural Design Studio was more of a mixed media class. The use of traditional physical model making, freehand sketching, and digital constructions were explored. The migration in and out of the digital realm was emphasized. When is it appropriate to leave the digital realm and when is it appropriate to return? These classes are conducted during the regular Fall Semester and afford more time to evaluate and reevaluate the level of integration of digital media at this level. The development of Hybrid media in the description of the process was an interesting way of conceptualizing how to communicate design processes with digital and traditional media.

The assignments revolved around the development of Methodologies based on controlled transformative operations. A single method was first to be designed and developed leveraging



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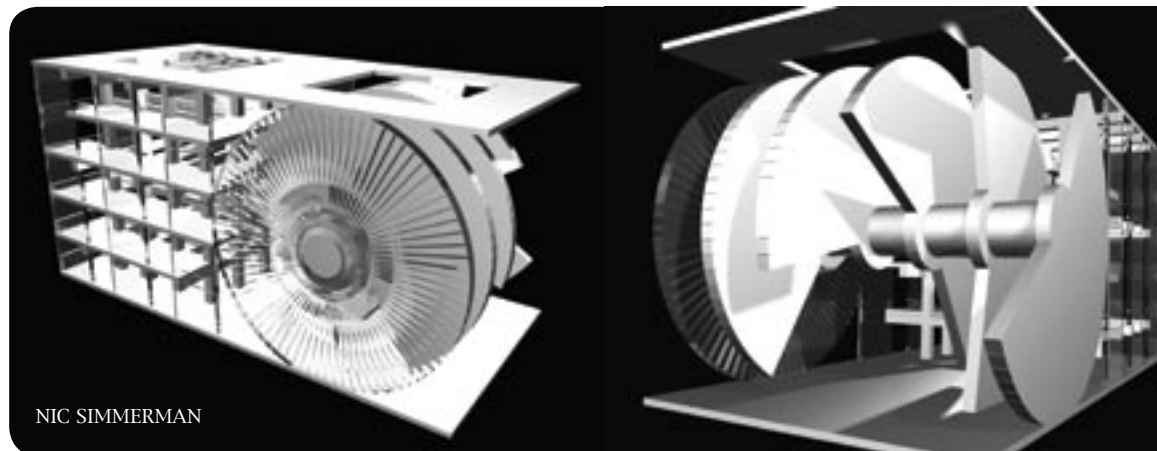


the freedom from physical constraints that the computer affords us. Issues of weightlessness, orientation, densities, and organizational development were explored in the design of this first method. A series of modification exercises helped to refine the project and clarify behavioral characteristics of the system being designed. One of the major concepts of the assignment is to get the students to make a conceptual link between traditional analog design thinking modes and digital techniques. How do you design a system w/ specific and deliberate transformative conditions that lends itself to the design of architectonic spatial constructs? A requirement to design a second methodology that engages the first was introduced to the project later in the semester. The establishment of explicit relationships between the two systems was developed by the students. Each system had to influence the other and begin to establish precise moments of engagement and disengagement.

Ideas of dominance and refinement of systems into primary and secondary readings were incorporated into the project. The notion of interdependencies, segregation, integration, and stability were incorporated by the introduction of an anchor component. All three devices were to engage each other and establish new connections and relationships. The idea was to keep the students thinking about relationships that were established, and modification strategies that responded to the introduction of new components. Each student was given the flexibility to design specific associations between each system.

The final phase of the project then moved into a state where the methods and relationships established were leveraged to develop dynamic habitable constructs. Students designed their methods through the development of notations and operations that are used to design these Spatial Constructs. Each Construct incorporated unique ideas for use and program developed by the students. They quickly ran through a series of conceptual models considering topics such as collapsible self-sufficient structures or reversing of anchoring mechanism relationships. They questioned attachment methods and conventional orientations for grounding. The result was the design of a Tectonic Spatial Construct that embodied the characteristics of the dynamic methods designed.

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