Digital tools are evolving design culture by facilitating analysis and integration of broad criteria and concepts, as well as form generation through performance evaluation. Biomimicry, algorithmic design, digital simulation and fabrication are modes of design conception, exploration and execution that stimulate creativity and fresh thinking.
Prior to the Industrial Revolution, the dialogue between maker and machine was dependent upon an innate knowledge, honed through years of experience, derived from a close relationship between the craftsman and the material. The machine, in this instance, was an extension of the craftsman. This process, “by which the quality of the result is not predetermined, but depends on the judgment, dexterity and care which the maker exercises,” ¹ is, as ascribed by David Pye, the “workmanship of risk.” Contrast to this is the “workmanship of certainty”, which is predicated on mechanized mass production where the objectives are speed, quantity and predetermination.

With the advent of the Digital Age, many new materials and processes have arisen requiring a new relationship between maker and machine. Within this dialogue, which must begin on the digital stage, I argue that it is the material, through its embedded intelligence, that now acts as the arbitrator. It is the intelligence within every material, be it wood, metal, acrylic or clay, that directs both the material’s effective use and limitations. Similarly how a material is detailed, manufactured or performs under various environmental conditions is inevitably driven by its own embedded material logic.

Although digital fabrication and computer numeric controlled (CNC) technologies allow designers a precise means for physically replicating what was once purely digital, the process itself is still necessarily limited by two factors: the parameters of the machine and the properties of the material. The parameters of the machine, like anything that has been assembled from a finite set of determined parts, are predictable and reliable, and thus part of the workmanship of certainty. Where the variation lies, and thus the potential for novel design, is within the material itself.

Accurate digital modeling of material properties can be significantly difficult, especially at the level of investigation typically pursued by students of architecture. Additionally, even the most sophisticated digital models struggle at matching the variations and subtleties embedded within the multitude of novel materials now available. In order to understand these properties there must be an anticipation of transformation in the hands of the maker derived through empirical analysis and the physical testing of the material itself. As the sociologist Richard Sennett states, “…machinery is misused when it deprives people themselves from learning through repetition” ². In other words, it is through the repetitive act of fabrication, experimentation and analysis that one is able to qualify a novel material and project the results of its potential operation at the architectural scale. Without understanding the qualitative physical parameters of these novel materials it is difficult to anticipate physical or tectonic failures at the architectural scale. It is through full-scale prototyping, a process in which the simulated digital model is continuously tested and iterated through CNC operations, that we begin to create the necessary opportunities for discovery and understanding of novel materials and their potential capacities for use beyond desktop objects.

Perhaps as a response to the complete stranglehold that the digital project seems to have had on architectural schools over much of the last two decades, digital fabrication has recently been held up as an alternative model - a means of return to the craft of building. Still, I would urge students and instructors alike to view digital fabrication with the same kind of productive skepticism that is now so readily heaped on the pure digital project.

Architecture is simultaneously well-situated to deal with this shifting paradigm, and extremely vulnerable to its potential pitfalls. Architects, by definition, have always worked to actualize the virtual - we organize data (drawings) that are given to others (contractors) for construction. While some have touted digital fabrication's potential to usher in a return of the “master builder” model of architecture, I would suggest that the fundamental model of our practice hasn’t changed; we organize data (now, digital files) which are given to others (now, computer controlled machines) for construction.

Perhaps more significantly, these fabrication tools have in some cases left architects free to labor under the false assumptions of their own expertise. Resumes touting CNC milling and other fabrication experience are pouring out of schools. Interns with Grasshopper skills are now making decisions with enormous and expensive repercussions, often with just one or two actual projects under their belts. But those very interns are often easier for designers to communicate with; they speak the language that fabricators too often do not.

This is not to say that the fabrication knowledge and skills now being taught in schools is not of value or is somehow misguided, but rather that we need to avoid the tendency toward fetishization of fabrication, just as has been necessary with the pure digital. Glossy renderings are less impressive with each passing year as the tools become ubiquitous and the techniques more transparent. It’s my hope that the same will be true of 3D prints and milled foam panels.

What is needed from academia is a critical attitude about the tools - an understanding that while they allow architects to expand their design palettes, the primary strength that they offer is a means by which to deploy knowledge. But it is equally important to recognize when that knowledge needs to come from outside of architecture.
The project design is based on a pitcher plant and the idea of parasite. In order for a parasite to exist, there must be a host. In this project the host becomes the world itself, rather than the storefront space. The pitcher plant conceptualizes the parasite’s idea of consumption, which can be then visualized and designed accordingly. Working from the organic form of carnivorous plants, we used the idea of consumption to generate our parasitic geometry. Using the Storefront as its host, this parasite grows by consuming whatever it can take from the outside world: starting with the block panels of the Storefront and growing beyond. At night the parasite closes in order to rest and digest its prey. The ribbed portion of the parasite is imagined to be its structural framework holding a fabric mesh as its skin, that opens and closes depending on the time of day. The ribbed structure is broken in order to provide open spaces for visitors to explore.
SO MANY OF THEM, IT'S LIKE A CORNFIELD!
IT'S LIKE A CORNFIELD!
Reflective Transformation

Unit A

Unit B

Unit C

Unit D

Unit E
Reflective Transformation is a part of a digital fabrication lab project. Through the exploration of material, fabrication tools and 3-dimensional programs, reflective transformation challenges the use of light and geometry. Each unique shape creates a completely different reflection of each other, once in contact with light it is then reflected onto any given surface.

SPIKE PAVILION

The "Spike Pavilion" is part of the Integrated Software in the Architectural Office course. It is generated using paneling tools in Rhino to address the design of a repetitive 3-dimensional pattern. The overall design is built upon a unit that manifests the "spike" as a design operation for a canopy. Repetition of the spike component will result into a complex 3D landscape, ultimately an experiential open air space.
A neuron is an electrically excitable cell that processes and transmits information through electrochemical signals.

**Metamorphosis**

def.: a change of the form or nature of a thing or person into a completely different one, by natural or supernatural means.

(Oxford Dictionary)
There are many points of new discernment in a digital transformation protocol. These points signify a moment throughout the creative process where we elucidate an opening chance for future unique operations embedded in the overall process. From a time frame perspective they are also understood as points of no return. They occur when the transformation degree applied to the model reaches a momentum where we don’t identify the origin anymore and becomes (literally speaking) a different model. If exponentially surpassed the point of no return, the results from different attempts ultimately form their morphological characteristics independently of the original model (we deal after all with digital representations with different polygon configuration). Knowing the logic behind the points of new discernment is similar in any other intellectual process: the most important event in a creation methodology is the ability to recognize the moment to stop creating or in other words to recognize the moment of lucidity and thereafter deviate into a new process with a new set of rules. As we transform a digital representation we perceive how our memory link with the original model relaxes, weakens or is forgotten. It defeats order in the realm of perception.
Assimilation

def.: 
1. to fully understand an idea or some information so that you are able to use it yourself. 
2. to become, or allow somebody to become, a part of a country or community rather than remaining in a separate group.

(Oxford Dictionary)

As noted by Freud, “Identification is not simple imitation but assimilation on the basis of a similar aetiological pretension; it expresses a resemblance and it is derived from a common element which remains in the unconscious”¹. By understanding the actions derived from the search of causations, we find the parameter that rules the assimilation protocol for each metamorphic analysis. The action of assimilation requires the student to agree upon a set of narrative structures (called themes in the course) that guide the process. The aim is to encounter dynamic systems captured through an evolutionary digital dialogue in search for new ontological definitions. These conversations move beyond a simple linear deformation process and enter the realm of multi-direction and multi-layered conceptual evolutions.

¹ Sigmund Freud, The Interpretation of Dreams
New York City College of Technology is on the rise! In February 2014, NYCCT was accepted into the 2015 Solar Decathlon competition, taking place in Irvine, California. Of the 20 schools chosen internationally, City Tech is the sole undergraduate program that will be competing. Competitors include Ivy League giants such as Yale and Stanford University as well as major collaborative forces like University of Florida with the National University of Singapore, University of Texas with Technische Universität München in Munich, West Virginia University with University of Roma Tor Vergata and Western New England University, Universidad Tecnológica de Panamá, and Universidad Tecnológica Centroamericana located in Honduras.

City Tech is on the world stage now and this acceptance could not have come at a more promising time. The school of Technology and Design at City Tech has grown exponentially in the past few short years. An expanded curriculum for current and prospective students, City Tech’s OpenLab and digital fabrication programs enable us to use cutting edge technology with realistic promise that have evolved for the betterment of the student body. Student participation with the urban and local community are bringing paid internships for all City Tech students, through work with RF CUNY Service Corps and collaborations with the Brooklyn Tech Triangle. Students have taken initiative as well and just last year 3 new clubs have emerged in the architectural department alone. With the addition of BlackARCH, DiFab and the STA, there is a unifying thread throughout the student body and exposure of the undergraduate community to opportunities outside their classrooms.

The STA represents the Sustainable Technology Association. The group began in spring 2013 by passionate students dedicated to the future of sustainability. Set on a mission to integrate a holistic lifestyle into the built and urban environment, the club earnestly submitted for the upcoming Solar Decathlon competition. Imagine the overall surprise and excitement when they learned they were accepted after a recent rejection in 2011. Hard work pays off, but it was clear to the small group of students, that the real work had not yet begun.

DURA devotes serious efforts towards the evolution of innovative technological advancement. Part of the plan is to make use of existing fabrication labs to build, construct and develop prototyping systems for the Solar Decathlon project. Work with parametric design and fabrication has given the school a new dimension to create and materialize the vision. Team DURA aims towards a design solution that not only responds to energy demand, but also adapts to the diversity of New York City’s vigorous lifestyle.

Departments such as graphics arts, paralegal studies, business, mathematics, accounting, architecture and all engineering disciplines, with the cooperation from faculty and staff, will participate in the competition next year in October.

For NYCCT, the opportunity to compete on an international level can be the catalyst needed to raise the standard for the four-year college as an inner city force to be reckoned with. It will serve as a premier introduction of a New York City university to the architecture and construction communities at large. Practical knowledge gained in nature implemented design and research and development to the realistic building of a small scale home, will set our students apart. The DURA home project is a community effort. All who are interested in the viable future for New York City residents are welcome to participate. Come and be a part of history in the making; be apart of exciting, dynamic and innovative solutions for future generations to come.
Adapting Traditional Japanese Architecture

Panel Mobility:
- Horizontal movement
- Rotates towards the outside
- Pull-out

Panel Options:
A. Paper Screen - Panel
B. Wood Panel
C. Wood Frame

Panel Options:
1 2 3
4 5 6
ADAPTING TRADITIONAL JAPANESE ARCHITECTURE TO CONTEMPORARY DESIGN

Brian Lall, Michelle Matthews, Loyra Nunez, Erick Ramirez, Faculty Advisor: Esteban Beita, Assistant Professor

Hiunkaku Pavilion, Kyoto Japan

Following traditional Japanese tearoom architecture, we identified a transcendent philosophy of an integrated environment together with the different design aspects that make these rooms culturally important. Through the creation of adaptable sliding panels, a space can effectively transform during any period of the year to enhance the atmosphere, flexibility and sustainable qualities of the space. These principles allow spaces to adapt through the control of views, illumination, and ventilation. These design principles can be applied to any contemporary space in different urban settings, adaptable to the location and culture.

Renge-ji Temple

This temple located in the north of Kyoto is hidden quietly in sacred Mount Koya. The temple was taken apart and moved from Kyoto to its present location during the Edo Period. At the left hand side of the path just after going through the gateway, this temple, belonging to the Tendai Buddhist group, possesses the atmosphere of a Zen temple.

This temple is known for its garden, which reflects the beauty of seasonal changes. The existing main garden (Chisen Kaiyushiki Garden) was designed by Ishikawa Jozan. A pond is located in front of the temple; it reflects nature into the interior spaces and allows the interior to blend with the exterior. From the interior space one can enjoy views of Mount Koya and trees surrounding the pond, which change from season to season. The interior provides a contemplative atmosphere to enjoy tea in this space merged with the garden and nature.
A series of digital and physical models, digitally rendered environments and geospatial representation is used to create a topographical map of Staten Island. This research and graphic exploration demonstrates an application of diverse tools to the development of visual diagrams that communicate complex issues of topography and climate change impacts.
REMEMBERING PROFESSOR BILL BERENSMANN Tim Maldonado, Professor

Bill Berensmann embodied the greatest aspirations of his generation, and he dedicated himself to making our world a better place. He was a free spirit who took tremendous joy in traveling with students and opening their eyes to the cultural wonders that surround us. He guided students through the architectural treasures of Paris, London and Rome, as well as in Spain, Sweden and throughout the United States. He exposed our students to new challenges. He obtained jobs for them here and in Europe, and helped students in their professional careers, even long after they graduated.

Bill forever changed the Architectural Technology Department. His generous spirit and love of adventure inspired students to explore new avenues. They became his extended family; he gave generously of himself. He was a math whiz who made structural design appear easy, mesmerized students with architectural history and motivated them to produce exciting design. He was truly loved by the many students whose lives he touched! Each semester his classes were filled to capacity on the first day of registration.

I was fortunate to have been able to call Bill a friend for over thirty years. Early in our long friendship, I met Bill in Paris on a beautiful spring day, followed by lunch at the elegant Musée D’Orsay. As we shared great food and excellent wine, he told me of his vision for the many exciting trips he was planning for our students. In the next twenty years he made those dreams a reality. He transformed lives and every student was enriched by having known him. His charm, wit and generous spirit will be sorely missed.