Supertall
Evolution works in incremental steps. Revolution works in paradigm shifts. The era of the SuperTall explores the need for revolution over evolution to consider the SuperTall high-rise not as the natural evolution of the skyscraper typology, but rather as a disruptive advancement that will redefine the concept of urbanism and our engagement with the built environment.

The high-rise tower has long since embodied humanity’s visions for the future city—both from a Utopian and Dystopian perspective. These references have not only come in the form of the built environment, but also through religion (ie. the Tower of Babel in the book of Genesis in the Holy Bible), literature (ie. the Wynand Tower in The Fountainhead by Ayn Rand), film (ie. the Tyrell Corporation Headquarters in Blade Runner) and other forms of popular culture—often as a lens for viewing the trajectory of civilization.

Prior to the modern age, people dreamt of a life in the sky, where tall structures were viewed as the greatest achievements of human civilization and symbols of technological progress. However, it was the advent of modernity and the age of modernism—enabled by the Industrial Revolution (through the mass production of glass and steel) and the invention of the commercial elevator and air conditioner (enabling automated circulation and hermetically sealed environments)—that served as the catalysts for the contemporary skyscraper. Today, tall structures continue to be viewed as symbols of ambition, power, technology, and sometimes even authority. High-rises in modern cities continue to grow taller, stronger, and faster. On a global level, cities around the world continue to compete to build their global presence and iconicity through the construction of increasingly taller towers. Tall is no longer tall enough, and the era of “SuperTall” has begun.

The tragedy of 9-11 provoked a new realization—it was a symbolic event that transformed the skyscraper from a symbol of security to that of a target. Following 9-11, Rem Koolhaas famously decided to give up the WTC competition and enter the CCTV competition in China as a critique of the conventions and cliches of contemporary skyscrapers: “similar towers grow up, imagination collapses.” However, with the completion of CCTV in 2012 an even more influential image of capitalism and power was created. Is it truly a new high-rise typology with imagination? Is it really challenging the modern skyscraper, or is it just an extreme version of the same conventions and tropes?

What is the high-rise of the future, beyond a symbol of social and economic status?

How do the SuperTall respond to a need for vertical urbanization and density in urban context?

How can we challenge the conventions of traditional tower organization and checkbox sustainability that dominate contemporary tower design?

Why do people often complain about the modern cities and high-rises and still want to go back to the old part of the city and praise its beauty and humanity?

Is it possible to maintain an emotional connection between the artificial and the natural in the urban high-rise?

The SuperTall studio seeks to answer these questions and more as architecture becomes the lens for thinking about the future of our cities. Can we leverage novel forms, emergent organizations and new technologies to define a new way of living and working that redefines the relationship between humanity and nature in the era of the SuperTall?
DEAN MA ASKED ME SEVERAL TIMES TO LEAD A STUDIO IN USC; I THOUGHT THE SCHOOL HAS A STRONG APPROACH TOWARD GLOBAL CHALLENGES, INCLUDING THE URBANISATION IN THE U.S. AND CHINA. IT MUST BE INTERESTING TO DESIGN SUPERTALL BUILDINGS AS VERTICAL URBANISM BOTH IN NYC AND SHENZHEN, TWO OF THE YOUNGEST AND MOST DYNAMIC CITIES IN BOTH COUNTRIES. CHALLENGING THIS TOPIC IS NOT A USUAL JOB THAT EVERY ARCHITECT CAN EXPERIENCE, ESPECIALLY IN CALIFORNIA. BUT DEAN MA ALWAYS TRIES TO SET UP A GLOBAL VISION FOR YOUNG PEOPLE, AND I THINK A PROJECT LIKE THIS WILL LET THE STUDENTS BELIEVE IN THEMSELVES, THAT THEY CAN ACHIEVE SOMETHING THAT SOUNDS IMPOSSIBLE, JUST LIKE THE INCREDIBLE PROPOSAL DEAN MA ANNOUNCED FOR THE ‘TRUMP WALL’ RECENTLY.

Ma Yansong, Principal
MAD Architects, 2016 USC Distinguished Dean’s Visiting Professor
THE ‘SUPERTALL’ STUDIO DEMANDED STUDENTS DEVELOP SKYSCRAPERS IN TWO DIFFERENT CULTURAL CONDITIONS. THE STUDIO’S UNIQUE DESIGN PROCESS PROVIDED AN ENVIRONMENT IN WHICH STUDENTS WERE FORCED TO CONFRONT A UBQUITOUS AND RELEVANT ARCHITECTURAL CHALLENGE: DEVELOPING CULTURAL ICONS THAT RESPOND TO BOTH A CONTEXTUAL AND GLOBAL AUDIENCE. A FUNDAMENTAL QUESTION THAT THE STUDIO PROFESSORS FACED WAS THIS: HOW CAN ARCHITECTS EDUCATE THE FUTURE GENERATION TO DESIGN TOWERS AT BOTH THE LOCAL AND GLOBAL SCALE?

Erin Cuevas ’12
Principal, CMLA
Instructor, USC Architecture
In his article “Structure, Scale and Architecture”, the “architect” Myron Goldsmith assembled a striking page of images that offered a chronology for the past and future of the skyscraper. The first half of the timeline showed the load-bearing and steel frame construction of John Wellborn Root’s Monadnock building (1889-91) and the reinforced concrete slab and column system of Mies’ Promontory Apartments (1948-49). The second half showed Goldsmith’s own Master’s Thesis Project at IIT, 1938. These images are symptomatic of this difference—ranging from the image-based submission by Daniel Libeskind, to the “performance-based” scheme of United Architects. Goldsmith’s graduate research will be used as a lens from which to see contemporary research on the skyscraper. Curiously, within the typological and environmental questions that surround this research, the term “architectehnology” implicitly raises the question of the relationship between architecture and technology, with Goldsmith as a figure that searched for alliances to redefine both.

FROM “ORGANIC” TO A NEWFOUND ORGANICISM

The Program for Architectural Education developed by Mies in 1938 was diagrammed into a compelling chart striking in its clarity. The education of an architect was subdivided into three main phases: “Means” (materials, construction, and form), “Purposes” (building program), and “Planning and Creating”. These three phases bridged from the pragmatic and empirical to the more abstract aspects of the architectural project. This last phase was further subdivided into a number of responsibilities across the material and the conceptual forces that shape the architectural project: “analysis of techniques”, “analysis of culture” and “culture as an obligatory task”.

A first set of responsibilities pointed to the need of understanding a “Dependence upon the Epoch” from the perspective of “material structure”, “functional structure” and “spiritual structure” as “an analysis of the supporting and compelling forces of the times”. The broadening of the terms from the specific to the very abstract, or spiritual, signaled the need to synthesize across the material with the conceptual and cultural. A second set of responsibilities searched for “Possible Principles of Order” including “The Mechanical”, “The Idealistic”, and “The Organic”. Within this last term, the potential of finding an “Organic” “Principle of Order” was defined by Mies as “the essential significance and proper proportioning of the purposes and functions of the various parts as they relate to the whole”. In this sense, “organic” was used by Mies to mean coherence in order. He would describe the curriculum as one that “in itself incorporates this clarifying principle of order, which leaves no room for deviation and which, through its systematic structure, leads [to] an organic unfolding of spiritual and cultural relationships”.

From an isotropic to an isomorphic organicism: Myron Goldsmith’s newfound organic principle in high-rise structures and its legacy in contemporary design practice

Daniel López-Pérez

1. Betty J. Blum, “Myron, I’ve read that when you were introduced by the President of the Royal Institute of British Architects in 1966 you were introduced as an architectologist. [architect and engineer…]”, Oral History of Myron Goldsmith interviewed by Betty J. Blum, Chicago Architects Oral History Project, Ernest R. Graham Study Center for Architectural Drawings, Department of Architecture, the Art Institute of Chicago, 1990, p.1
3. Itaki Abasol and Juan Herreros described this transformation: “With his new scheme Goldsmith moved away from the Miesian Platonian-solid archetype and drifted toward a subtle but profound transformation of the skyscraper. This transformation was characterized by the decomposition of the structural system in response to specific forces and functional demands, components placed on the periphery of the building in response to wind load, appropriate adjustments to scale, and increasing specialization of load-bearing and structural materials.”; “The end of the reticulated Frame”, Travail and Office, From Modernist Theory to Contemporary Practice, 2003, p.52
4. Charles Jencks, “Now every new corporate headquarters seeks to be an icon, has to have a nickname that sums it up, a one-liner, a bullet point that journalists love to hate, love to spice up their workday prose—‘erotic gherkin’, or ‘shard’, or ‘crystal beacon’. Tall buildings are no longer content to be concealed phallic symbols, they have to come out of the closet, declare their sex, strut their stuff.” The Iconic Building, 2005, p.13
Myron Goldsmith’s Master Thesis Project “The Tall Building: The Effects of Scale” (1948-1953) searched for “a new structural type for tall buildings in reinforced concrete [where] structure and function have been analyzed to show their influence on the height of the building and their influence on the architectural expression.” He outlined the “Structural Problems of the Tall Building” showing Root’s Monadnock and Mies’ Promontory buildings as references. The Monadnock was described as having reached the limit of height for a masonry building where “its walls six feet thick at the base, [decreased] gradually through the upper stories to thirty inches in thickness”. The Promontory was seen as having reached the practical limit with respect to the flexibility afforded by the structural frame to the floor plan where “the thickness of the floor construction may remain constant for every story, whereas the columns and girders must increase in the lower stories due to the increase of vertical and horizontal loads” something that “tends to interfere with the use and flexibility of the interior space”. Seeing both precedents as “interfere with the use and flexibility of the horizontal loads” something that “tends to due to the increase of vertical and horizontal loads” something that “tends to interferes with the use and flexibility of the interior space”. The upper seven floors hung from the top of the upper transfer slab, while the lower seven floors rested on the lower transfer slab for each section, producing an even distribution of tension and compression, and curiously leaving the middle floor column free for each of the sections.

In the project description, Goldsmith divided the text into three sections: “Structure, Function and Architecture”. “Structure” described the formal differentiation and reduction in the amount of structural mass as the building increased in height where the “skeleton has columns fourteen feet by sixteen feet in cross sectional area at ground level […] diminish in their sectional area throughout the total height of the building”. “Function” described the virtue of this gradual reduction of structure and core as leaving more of the floor area open to the program. “Architecture” focused on the project’s expression structurally and visually. The “form of the superstructure expresses the fact that the loads diminish as the height of the building increases”, and the “number and proportions of the super stories [are] decided by visual considerations.” Similar to the Monadnock and Promontory, in merging the structural with the visual into a single condition of expression, the project’s varying form synthesized both into an irreducible form.

SCALE AND MAGNITUDE THROUGH SIMILITUDE

Goldsmith revised and expanded the text of his Master Thesis Project throughout the course of his career, exploring the concepts of “scale”, “magnitude”, and the “effects of changing magnitude”. He referred to Galileo in arguing that “scale” had “a decisive influence on its structure and function [in all] organism or artifact”. The relationship between a body and the forces that acted upon it as it changed scales was variable and was illustrated in the thesis as a curve. A point could be found on this curve to be the most efficient ratio between a body and the forces acting upon it. Goldsmith referenced Galileo’s claim that an “ultimate size for structures” existed after which they became too small or too large to efficiently manage the gravitational forces upon them “unless the strength and nature of the material of which they are constituted changed.” The example of a prism, cylinder or an obelisk illustrated this relationship in cases where the form correlated with the gravitational forces acting upon it. For Goldsmith “every structural type, whether organism or artifact, had a maximum and minimum size.”

With respect to defining the concept of “magnitude” Goldsmith referenced to D’Arcy Wentworth Thompson’s On Growth and Form. Thompson described the ratio between structural mass and overall volume as variable and dependent both on the scale of the form and the gravitational forces acting upon it. He used the ratio of bone structure to whole body mass as an example to show that “as the size of an animal increases the limbs tend to become thicker and shorter and the whole skeleton bulkier and heavier; bones make up some 8 percent of the body of a mouse or wren, 13 to 14 percent of goose or dog and 17 or 18 percent of the body of a man”. In this sense, the ratio of structural mass to overall volume and the shape of the form determined its structural efficiency. With respect to vertical forms, Goldsmith drew the relationship between structural mass and overall volume as a logarithmic curve, one capable of illustrating areas of uniform structural resistance while reducing volume and surface area: “Smeaton took it for the pattern of his light house and Eiffel built his great tree of steel 1,000 feet high to a similar but stricter plan [where the profile] tends to follow a logarithmic curve giving equal strength throughout”.22

On Mies’ advice, Goldsmith read and transcribed many passages of Thompson’s On Growth and Form. He would later recount that in Mies’ office “everybody was thinking about the skyscraper” and how Thompson’s section on “scale just made a huge impression [where one] could find distinct structures that would change what buildings look like”. A second concept of Thompson’s that made an impact was that of “relative magnitude” or the possibility of form to become variable or capable of responding to a set of changing gravitational forces that acted upon it. The “effects of scale” impacted not only the structural mass but also the ratio of surface area to volume. The relationship between “scale” and “relative magnitude” was found in Thompson’s “Principle of Similitude”, or the “dynamic similarity” between the “forces in action in a system” and the “masses, distances or other magnitudes involved”. From this principle Goldsmith deduced that the relationship between form and its structural performance was relative to the structural mass and the ratio of surface area to volume and could not be assumed to be proportional with respect to scale shifts. Seeing this relationship as relative rather than proportional opened up the possibility of understanding the body’s form as having an effect on its performance and expressing this performance.

For Goldsmith, the “principle of similitude” was the correlation between the “physical forces [that] act directly on the surface of the body […] in proportion to its surface or area.” With respect to the problem of the tall building, the “principle of similitude” related the structural frame and the overall form and volume of the project. The “tapering” of the structural frame, reducing structural mass as the building in height, resulted in an increase in overall volume while reducing overall mass and thus structural resistance. Similarly to an obelisk, the project’s form could resemble the curve of its structural performance and follow Thompson’s “principle of similitude”.

In closing his Master Thesis Project, Goldsmith listed four conclusions: “1. Size of columns in lower stories, 2. Large rooms for meeting [as a] serious structural problem, 3. Concrete was chosen to illustrate principle of scale, 4. We have discovered certain maximum, minimum and optimum size”. The first two focused on the relationship between structural mass and volume, describing the increasing and decreasing scale of the structural system and its programmatic impact on the floor plan. The last two focused on the form of the project and its legibility where reinforced concrete could “illustrate” the principle of scale. Through the “principle of similitude” the form of the project could offer both a varying degree of structural performance while simultaneously being the basis for the building’s expression.

Thompson’s concept of “reciprocal diagrams” further developed a method to
arrive at this condition of “similitude”: “Working by the methods of graphic statics, the engineer’s task is in theory, one of great simplicity. He begins by drawing in outline the structure which he desires to erect; he calculates the stresses and bending-moments necessitated by the dimensions and load on the structure; he draws a new diagram representing these forces, and he designs and builds his fabric on the lines of this statical diagram.” In extreme functional cases, such as in a suspension bridge, this correlation is almost one to one. With respect to tall structures, Thompson pointed to the form of the Eiffel Tower as illustrating a very close correspondence. In this sense, Goldsmith’s Master Thesis Project becomes a “reciprocal diagram”, one that synthesized structural performance and form into an irreducible condition that both performed and expressed this performance—a new found organism between structure, order and expression (“structure”, “scale”, “architecture”).

THREE PROTOTYPES

The diagonal brazing was argued to offset the premium cost of structure required to deal with the increased lateral loads of buildings of this height: “Without diagonals the dimensions of the columns and girders would be greatly increased, thereby increasing the volume of the building devoted to structure as well as increasing by about fifteen percent the weight of the structural steel”. Both projects established a legible hierarchy between primary and secondary structural systems, but came into contrast formally; where the first changed as it gained height, the second remained the same throughout.

In the exhibition catalog, the intricate scale shift in the scale of the structural and window grid was explained as “not for reasons of realistic construction techniques, but occurs rather in several stages... a direct structural expression of the construction principle”. The fact that these changes were derived both by structural performance and as “expressions of the construction principles” introduced the structural frame as a “self-referential sign”—one where architectural form was determined simultaneously by the performance of the structural system and the image of this performance; where both formed the basis for its legibility. As a “self-referential sign”, the expression of the structural performance in the pattern of windows was suppressed and made more abstract by its intricacy, increasing the autonomy of its form away from structural performance and towards a more conceptual figuration. From afar, the form of the building appeared to be a smooth monolithic volume whose surface was textured by a regular pattern. Upon a closer look, what at first glance seemed to be a static pattern began to be animated through the changes of scale of the openings in the surface.

In the same year of the article “Structure, Scale, Architecture”, the exhibition “100 Years of Architecture in Chicago” showed Myron Goldsmith’s Master Thesis Project alongside Mikio Sasaki’s “A Tall Office Building” (1961). As a steel frame counterpart to Goldsmith’s reinforced concrete project, this thesis proposed an “optimum column-diagonal truss tube” as a prototypical solution to exterior “X-brazing” of buildings between 80 and 100 stories, and in the exhibition catalogue was described as a “structural concept [traceable] to the John Hancock Tower”.

In this instance the structural system was composed of a reinforced concrete tubular frame complemented with two internal diaphragm walls. The result was three tubes that worked in combination described in the exhibition catalog to be “the precursor of the form of the Sears Tower”. Located in the load-bearing structure along the perimeter allowed for the floor plan to be almost uninterrupted, leaving a single column between the exterior wall and the interior core. In this outer surface, the windows that formed the grid pattern of the exterior changed along with the depth of the exterior ribs that formed the grid. This very gradual, almost imperceptible change in scale of the windows also represented a change in the mass versus volume ratio of the project. As it was the case in the previous examples, as the project gained height, it reduced structural mass versus its overall volume. In the text of the thesis, the project was described as “an attempt […] to reconcile the two aspects of the building expression: the architectural and the structural expression [where] the actual dimensions were aesthetically resolved. This did not jeopardize the efficiency of the structure, for as structural engineers know, optimization of structural design presents a fairly wide range of possibilities that can be resolved visually or otherwise. Thus the decisions of the architect become decisive and have great bearing on the architectural expression of the building”.

As a synthesis between the previous projects, “An Ultra High Rise Concrete Office Building” Master Thesis Project by Robin Lee Hodgkinson (1970) was also included in the exhibition. In this case the project also embodied the double condition of the frame as a “self-referential sign”, one whose expression was at once literal and figural. On the one hand the form of the project revealed a hierarchy between primary and secondary systems of structure, collapsing both into a single surface. On the other hand this structural surface pursued a formal transformation that can be argued to be motivated by something other than structure, where the pattern of the secondary structure gradually changes in scale as the building rises. In this sense, both patterns reveal the “structure” and the “image of structure”. This double condition is heightened by the fact that the surface itself forfeits a deep outer corrugation characteristic of a load-bearing reinforced concrete wall system and is transformed into a surface without depth.

17. 100 Years of Architecture in Chicago, Continuity of Structure and Form, Exhibition, Museum of Contemporary Art, Chicago, 1976
19. 100 Years…, “New Structural Systems…”, Ibid. p.80
In this surface, structure and the image of structure coexist as patterns with varying degrees of intensity, oscillating reflections of one another.

In this project, the complex repetition occurred in the gradual change of scale of the pattern of the openings as the volume rises. From afar, five equal sections are framed by the large X’s, each composed of 23 stories in the form of a pattern of square openings. From up close, each of these sections is different where the scale of the openings gradually increases as the building rises. Once again, a compelling double condition is achieved where the structural and formal expression of the building’s form have become one. The project’s conclusion is a testament to this double condition, one where the building’s expression is described as a “structural architectural solution”: “the variation in overall texture of the building, varying from almost all glass at the top, to a more solid character at the bottom, together with the gradual increase of the diagonal size towards the bottom, results in a structural architectural solution that a building of this size warrants”.

FROM TYPOLOGICAL TO ENVIRONMENTAL INNOVATION

In contemporary practice, challenging the limits of height continues to be one of the primary excuses to develop new technological research on structural systems. In parallel, the pursuit of unique images that form the building’s iconography challenges the empirical aspects of the project into unprecedented forms. Both the empirical and the discursive sides push one another productively towards innovation. The space between the empirical space of technological innovation and that of the iconographical discourse surrounding legibility becomes a fertile ground for innovation. Similarly to Goldsmith’s graduate research, finding correspondences between new paradigms of structural order and new forms of legibility, point to a new path of research into the present.

SUPERTALL RESEARCH

In response to the Lower Manhattan Development Corporation’s Ideas competition for the World Trade Center, two proposals: Foreign Office’s “Bundle Tower” and United Architects’ “Submission for the Lower Manhattan Development Corporation Ideas Competition for the World Trade Center Site” offered alternative paradigms of order and legibility. Considering the first as a prototypical version of the second, both projects developed a “bundling” typology in response to an increase in the overall scale and height of the skyscraper. FOAs “Bundle Tower” proposed a model of redundancy in the form of interconnected towers that buttressed on each other in response to a condition where the lateral forces have become greater than the gravitational ones; “being able to increase the moment of inertia of the structure without necessarily increasing the floor depth and the total area”. United Architect’s WTC Proposal followed a similar model of “bundling” in search of structural stability and redundancy where “rather than a single vertical cantilever tower, which has an inherent singular route of egress and system of structural support, the intent has been to develop a complex of interconnected towers that have inherent redundancy in terms of fire egress, firefighting access and structural support.” Both projects introduced a tubular strategy composed of a reinforced concrete core in the center and varying square and circular plan braced steel latticed tubes in the perimeter.

With respect to the figurative legibility of both projects, the part to whole relationship between the subdivision of their structural surface and their overall form was meant to be read as consistent. In the case of the “Bundle Tower”, the “lattice of the tower structure and the geometry of the bunch tower are ‘self-similar’ structures”; where the curvature of the overall profile of each of the six towers is consistent to the curvature of the lattice that braces the perimeter of each of the tubes. This ensured a consistent alignment between each tower to the others and to the form of the whole. In the United Architect’s WTC Proposal, the diagrid was oriented in such a way that the diagonal members find the shortest length within the diagonal of each of the diamonds, counter-balancing and thus expressing the direction of the vertical spanning of each of the individual tubes as they rise. In both cases, the subdivision of their surface expresses structural resistance and a consistent distribution of forces throughout both lattices. In this sense, the degree of correspondence between structure, order and expression are once again synthesized into an irreducible condition, consistent to the principles explored by Goldsmith in his graduate research at IIT half a century earlier.

Whereas the process of developing this newfound organicism between the project’s order and its image, both in the case of Goldsmith’s graduate research but also in the present, has primarily been based on overcoming typological challenges, a new line of contemporary research has emerged, one that focuses on gaining a deeper understanding of the relationship between the tall building and its environment. If the predominant method of design in the past has been to move from the typological to the local, this line of contemporary research is beginning to explore a new phase where the specificities of the local context are seen as opportunities to extend typological intelligence; one where “the correlation of emerging tower efficiencies and local specificities of the high-rise population, with the tower’s capacity to generate alternative expressions, […] can find true innovation rather than one-off, iconic extravagances”.

This shift marks one of the next phases of development within the research of the skyscraper, where the possibility of establishing deeper reciprocity between the typological and local protocols begins to transform both. If the legacy of the newfound organism that emerged from Goldsmith’s graduate research at IIT opened a more consistent and flexible relationship between the structure, order, and image of the high-rise; its capacity to become more responsive to the environmental specificities of its local context becomes the next challenge as the typology proliferates globally. In building new alliances between the typological and the local, a new legibility for the skyscraper can emerge, one that has the potential to engage the cultural and political forces that shape its local context, using these to expand the typological notions of performance that have dominated its research and development from the beginning.

25. In the case of FOA’s Bundle Tower, the core is 16.5m x 10.8m with a circular exterior braced tube that is 36 meters in diameter, resulting in column free floor plates of 1000 square meters. In the United Architects’ Proposal, the core is 21m x 21m with several square plan braced tubes attached to it that are 33m x 33m.
27. Alejandro Zaera-Polo, “High-rise Phyllum 2007”, p.28
THIS WAS AN ADMIRABLE INVESTIGATION INTO THE BROADENING OF THE SKYSCRAPER TYPOLOGY AS IT IS DRIVEN BY MARKET FORCES WITHIN SOCIAL, CULTURAL, AND URBAN TERMS.

Thom Mayne ’69 Principal, Morphosis Professor, UCLA
FAMILY TREE OF SKYSCRAPERS
<table>
<thead>
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<td>CURTAIN WALL</td>
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Evolution of Structural Systems in High Rise Buildings

Western Hemisphere

Semi-Rigid Frame

Rigid Frame

Frame with Shear Truss and Outrigger Trusses

End Channel Framed Tube with Interior Shear Trusses

End Channel and Middle Framed Tubes

.Exterior Framed Tube

Partial Tubular Systems

Interacting Systems

Shear Frames
The Two Towers: Manifestation

Experiments

Supertall 03
What to do next
Red Area will merge into larger volume.

TEAM: NEW BEE
Members: Lubin Han, Yang Li, Wuyang Yang

ISOLATED CONNECTED
The two progression show the evolution of the metaballs in parallel to the evolution of the individual programmatic spaces that fuse together to form complex functions.
The spaces represent connections between the centroids of the Voronoi spaces. This can inspire the connections between individual or collaborative programmatic spaces.
The Two Towers: Manifestation

SHELL - EXOSKELETON

BONE - ENDOSKELETON

SUPERTALL EXPERIMENTS

72

73

PROCESS
This is not the final form. We are trying to do research and develop aggregations with this kind of massing box components. We will use all these resources and research results to generate form.
The idea of inserting the same conceptual skyscraper project in two contrasting cities is a brilliant idea for a studio project. Taught by two culturally tuned architects, one Chinese and one American, the students produced unusual projects that were more than twins separated at birth. In many cases, they barely resembled each other visually. Instead, they were distortions of each other and derivative of their highly biased contexts and international filters. The results were thought-provoking and impressive.

Doris Sung
Principal, DOSU Studio
Associate Professor, USC School of Architecture
Program diagrams
New York

Shenzhen
Optimized path system
Simulation results

SUPERTALL PROJECTS

TEAM NEWBEE
Optimized path system in circulation
I was fascinated to see the range of ideas the students developed in this studio.

By designing towers in two different cities, the students had to address differences in social, economic, environmental, and political contexts, while also devising innovative architectural and technological approaches to the problem of high-rise design.

In the process, they examined the super-tall typology as an expression of 21st-century vertical urbanism.

Clifford Pearson
Director, USC American Academy in China
Skyscraper as a vertical extension of urban context
THE STUDENTS WERE INSPIRATIONAL IN TRYING TO EXPLORE THE POTENTIAL AS CREATIVES IN THEIR ROLE OF SPECULATIVE DESIGN WORK FOR THE CONSTRUCTION AND REAL ESTATE INDUSTRY IN BOTH NEW YORK AND SHANGHAI.

THE LESSER EXPLORED WORLD OF CREATION WITHIN THE FIELD OF ARCHITECTURE AND CONSTRUCTION IS THE ABILITY TO ENABLE OPEN SYSTEMS IN THE CREATION OF INNOVATIVE APPROACHES TO BUILDING TALL BUILDINGS. WHETHER THIS ENCOMPASSES THE QUESTIONABLE METHODS OF BIM (BUILDING INFORMATION MODELLING), OR ADAPTIVE PRODUCTIONS OF SOFTWARE DELIVERY METHODS, THE FIELD OF ARCHITECTURE, ENGINEERING, AND CONSTRUCTION IS INADEQUATELY BEHIND FROM THE ADVANCES OF INDUSTRIAL DESIGN/ENGINEERING AND VARIOUS OTHER COMPUTER SCIENCE-DRIVEN FIELDS, THAT LEAN IN MORE FREELY INTO EARLY ADAPTER MODELS OF OPEN INNOVATION.

DESIGN WORK FOR THE CONSTRUCTION AND REAL ESTATE INDUSTRY

THE FUTURE OF OPEN INNOVATION AND DATA DISTRIBUTION OF CONSTRUCTION AND ARCHITECTURE REQUIRES A LARGER AWARENESS OF HOW TO PROPERLY IMPOSE LEGISLATURE THAT COMPLEMENTS THE BUILDING INDUSTRY. ARCHITECTS AND REAL ESTATE DEVELOPERS WILL NEED TO WORK TOGETHER IN GETTING THEMSELVES BETTER ACQUAINTED WITH THE TECHNOLOGICAL ADVANCEMENTS WITHIN THE TECHNOLOGY SECTOR AND MORE IMPORTANTLY, WORK WITH POLICY TO BUILD A BETTER-GUIDED UNDERSTANDING OF HOW DESIGNERS AND BUILDERS COULD COLLABORATE IN AN OPEN FORUM.

IT IS MAGNIFICENT TO SEE THAT THE FUTURE GENERATION IS EXPLORING THE GENERAL STUDIES BEYOND THE CURRENT CURRICULA OF ARCHITECTURE AND IS REACHING BEYOND THE FIELD’S SPECULATIVE NEEDS.

Wendy W. Fok
Creative Director, WE-DESIGNS
Assistant Professor of Integrated Design, Parsons New York
Composite diagram, New York
Composite diagram, Shenzhen
THE TOWER, AT ANY HEIGHT, CONTINUES TO BE AN OBJECT OF FASCINATION WORLD-WIDE. FOR THE DEVELOPER, IT IS A PRIMARY TOOL IN THE TYPOLOGICAL BUILDING KIT. FOR THE ENVIRONMENTALIST, IT IS HIGH DENSITY ON A SMALL FOOTPRINT.

FOR THE STRUCTURAL ENGINEER, IT PRESENTS OPPORTUNITIES TO RESOLVE INSANE FORCES IN DRAMATIC WAYS.

FOR THE ARCHITECT, IT CAN BE AN ANXIOUS PROJECT—SO MUCH HISTORY, SO MANY CONSTRAINTS, SO MUCH PRESSURE TO BE DIFFERENT. FOR STUDENTS NOT ENCUMBERED YET BY THOSE ANXITIES, THIS STUDIO YIELDED PROJECTS BEYOND THE LIMITS OF THE INTRACTABLE FORCES THAT SHAPE HIGH-RISES. THOUGH THEY LOOKED UNFETTERED, ALL THE PROJECTS WERE RIGOROUS ON THEIR OWN TERMS AND INCREDIBLY DIVERSE WITHIN WHAT CAN BE A NARROWLY DEFINED ECOLOGY.

Neil Denari
Principal of NMDA, Neil M. Denari Architects Inc. Interim Chair, AUD at UCLA
From extreme private to extreme public