Foreignness: Hybridization and Mutation as Design Process

by

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ABSTRACT

Foreignness: Hybridization and Mutation as Design Process

by

Zhaoyan Zheng

Hybridization is to gain the advances from the Alien. Mutation is to evolve oneself to be an Alien. "Foreignness" may simply be an offset from the "norm" and "common sense" of a regional convention. Confronting with the foreign is an opportunity to stimulate mutation and hybridity, the mechanisms expected to lead towards architectural and urban invention. In this thesis project, through historical study and design experimentation, the exploration of a design process through productive interventions in mutation and hybridization provides a proactive guideline for future design applications.
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FOREIGNNESS

HYBRIDIZATION AND MUTATION AS DESIGN PROCESS

A THESIS PROJECT BY:
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RICE SCHOOL OF ARCHITECTURE
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FOREIGNNESS

定义

1. 与我殊异之族类。
2. 指禽兽狐鬼之属。
3. 指各种各样不同品类的事物。

DEFINITION

* Foreign
  Pronunciation: 'for-n
  Function: adjective
  Etymology: Middle English forein, from Old French, from Late Latin foranus on the outside, from Latin foris outside
  Date: 13th century
  1: situated outside a place or country; especially: situated outside one's own country
  2: born in, belonging to, or characteristic of some place or country other than the one under consideration
  3: of, relating to, or proceeding from some other person or material thing than the one under consideration
  4: alien in character: not connected or pertinent
  5: related to or dealing with other nations
  6: occurring in an abnormal situation in the living body and often introduced from outside
  7: not being within the jurisdiction of a political unit (as a state)

* Foreignness / -&n-n's/ noun

(Source: Merriam-Webster Online Dictionary.
http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=foreignness&x=0&y=0)
Introduction
"Many times in the past has it been proved that exchanges between different civilizations made milestones in the development of human civilizations."

-- Bertrand Russell

“过去已经多次证明，不同文明之间的交流筑成了人类文明发展的里程碑。”

-- 伯特兰·罗素

Introduction

My interests to this topic began long time ago since the moment of realizing that globalization brings the confrontation of foreignness to every region and every culture in this world to an unprecedented level of criticality for survival and growth, and mutation and hybridization has been a summary of the history of all.

My attempt is to bring out the issues of mutation and hybridization in culture transmission and lead to a conscious and operational design application in architecture.

This thesis investigation is aiming to develop an alternative design process, in which awareness in foreignness and cultural diversity have been taken into significant consideration, and productive interventions in mutation and hybridization bring out novelty and variety.

引子

我对于这个题目由来已久的兴趣，源自意识到全球化带给这个世界上各个地区各种文化之间的前所未有的正面遭遇、前所未有的生存和发展的危机感，以及变异和杂交其实就是我们全部历史的简说。

我的意图是要把文化传播过程中的变异和杂交问题重新突出，并由此导出一种有意识的、操作性的建筑设计方法。

这篇论文的探索，旨在发展一种非常规的设计过程；在这个设计过程中，异质性和文化多样性被充分意识和着重考虑，而对于变异和杂交过程的建设性的干预带来创新和丰富。
Overview
Overview of the Thesis Project

The final product that this thesis submitted is an operational guideline of mutation and hybridization as design process. Along with it, there are two demonstrative design projects, a self-inspecting review, and an open end encouraging future exploration.

Design through mutation and hybridization is to introduce the genetic decoding and genetic re-composition method into architectural design process, for the purpose of gaining advantages from the directed evolution and the hybrid vigor. It is a micro-level control that reaches the very internal determinants of the subject, yet responds fully to the external influences and driving forces. It is a productive intervention in the domestication and foreignization process, a phenotype control through genotype processing. The finding of this thesis is that design through mutation and hybridization is an efficient tool for stimulating substantial leap, enhancing cross-cultural communication, and promoting cultural diversity.

This thesis develops and demonstrates a mutation-hybridization design process for architectural application, through a parallel study (the hand fan project), experimental design projects (hand fan design and trans-cultural center design), re-examination (process revision) and generalization (submission of the template process).
The thesis report starts with a theoretical preparation of the investigation (Part I: Theoretical Preparation). In this section, theories and debates related to issues of cultural evolution and transmission are generally discussed, and the theoretical foundation of processing cultural entities with genotypic method is established. The concept and issue of foreignness is re-introduced in the cultural context of contemporary urban America.

The hand fan project (Part II: The Hand Han Project - Exploring the Genetic Process Through Hand Fan Design) is a four-step simulating experiment that attempts to serve as a working template for the mutational-hybridizational architectural design application in later stages of this thesis research.

In the hand fan project, first I encoded the hand fan typologies into "genetic" categories; then an examination was performed on the hereditary pattern along the entire history timeline of the hand fan development; and after that, based on cause-effect analysis of the major typological changes, I implemented an investigational hand fan design through mutation and hybridization among all the hand fan "genetic" resources I obtained from the above, as well as from some alien (non-hand fan) genes. In the fourth and final step, I looked back on the entire procedure in this study of the hand fan and laid out a step-by-step working template of the "design through mutation and hybridization" process.

Then I put this step-by-step working template into the context of architecture and urban design, in an attempt to reexamine it and apply a revised version in real world architecture and urban design practice (Part III: The Foreign Experiences - Context and Goal of Mutation and Hybridization in Architecture). To give this design exploration an explicit goal and clearly defined socioeconomic environment, I choose a site located at a multi-cultural and multi-ethnic community in Houston, where cultural and architectural mutation and hybridization is naturally an on-going process and the productivity of the procedure and quality of the outcome is a well-shared concern.

Studying the region and choosing the site provided me a framework of existing social and physical conditions, community needs and external forces that may induce and direct the mutational and hybridizational changes. With a broader consideration on cultural and racial issues in globalization, such as cultural evolution, cultural diversity, cultural identity, and cultural dominance, I define my goals of this architectural design to promote cultural integrity and diversity through an operative cross-cultural communication center. This center itself is a mutant of conventional design and a hybrid among cultures, programs, and entities; it goes beyond an architectural object and performs as a multi-function, multi-identity processor that invigorates the "becoming American" experience and stimulates cultural transmission and hybridization. It is an architecture that behaves like an action. Thus I call it the "trans-culture center".

The design process of this trans-culture center (Part IV: A Mutant and Hybrid Architecture - Developing the Genetic Process Through an Architecture Design) is a revision and a further exploration of the mutational and hybridizational design process extracted from the hand fan project. With the objectives defined above in mind, I start to select interested categories of architectural characteristics from both domestic (American contemporary urban default) and foreign (in this case, East Asian classic) genetic pools, and work on mutation and hybridization on a genetic level. Seeing beyond the purpose of architecture as a spatial accommodation, the genetic hybridization has also been conducted between architectural and non-architectural entities.
The overall outcome of the process has been satisfying. A project (the Houston Trans-Cultural Center) designed by applying this mutation-hybridization process has demonstrated a completely new concept of architecture that serves the goals defined: a novelty in diversity, a mutant from norm and convention, and a hybrid between domestic and foreign, building and landscape, shading and lighting, program and advertiser, architecture and publication, shopping center and cultural museum, entertainment and education, room and processor, and statement and action.

Review of the architectural/urban design process above leads to a revision of the working template for mutation-hybridization design process (Part V: Summary of the Product - The Work Template), and a reposition of my standpoint in domestication and foreignization during the process of cultural transmission, and in this particular mutation-hybridization process as a design technique (Part VI: Conclusion). It is the revision and re-submission of this working template that eventually helped me clarify the meaning and limitation of mutation and hybridization to architecture, the implication of foreignness to American society, and the power dynamics between domestic and foreign, dominant and non-dominant, majority and minority.

The conclusion of this thesis project does not close the case of foreignness and mutation and hybridization as design process; rather, it attempts to raise further interests on these issues in realm of architecture. As a initiate research effort, this thesis revealed both strengths and limitations of the design process. For example, for a specific project in complex reality, both internal genetic potentials and external determinants are still up to the designer’s arbitrary selection among numerous possible stake-taking factors. Besides, the guiding template of the process does not function as a cookbook and is not a universal cure-all for cross-cultural design issues - the complexity of the socioeconomic context and non-linear nature of all research design progress determines that under different circumstances and handled with different sensibilities, the outcome could be varied greatly. Yet, all possible results would represent interests from all parties participating the mutation and hybridization process. In this sense, no matter what specific design paths a project is taken through, the final design product will contribute to the overall diversity and evolution of human civilization in a more defined, productive, inclusive and conscious manner than ever.

Future application in a similar cross-cultural circumstances should be conducted with full awareness of the advantages and limitations mentioned above. Through this design process, simple and thoughtless superimposition, collage and implantation among cultural entities on pure phenotypic level could be avoided effectively, and the ultimate quintessence of existing genetic resources (both domestic and foreign) can thus be fully metabolized and sublated.
The Thesis Report
PART I: THEORETICAL PREPARATION

Issues on Foreignness
Mutation, Hybridization, Evolution, Culture, and Design

Evolution, development, enhancement, growth, innovation. These are the words that represent the ultimate meaning of being. All these words indicate one's ceaseless action of becoming foreign to its presumed and present identity. Being and becoming is an eternal process of self-sublation.

This dogma, beginning with Nietzsche and further developed by modern philosophers such as Derrida and Deleuze, governs not only biological organisms, but also the entire material world, and the social structure of human beings.

Prigogine, Kauffman and DeLanda sustained the theory that the non-linear history of time, space, and human civilization is the history of the never-ending war of being against entropy. Evolution is a process of increasing order and complexity over time. Evolution thus found itself in a dilemma: entropy and dissipation delineated the path of the evolution -- a species is determined to evolve in order to adapt to the dissipative, ever-changing environment and to eventually extinguish as the species defined, yet the evolution of individual species purports to overcome the work of entropy on themselves.
That is why we see what we see in the real world: species keep domesticating themselves to the ever-changing environment by keep alienating themselves to something else. One survives by becoming someone else. One lives by letting part of itself die. The internal controlling genotypes inhered the consciousness of self, while the species replaced some part of its genotypes with mutated or alien genes for advancing. The renovation of the species is achieved through mutation - an exploratory behavior prepared for the natural selection, and hybridization - an outreach to gain advances from other species. Both of these actions involve a certain level of design. Through mutation and hybridization along with the process of the external selection, generations of survivors constantly consolidate the restructured identity of their species, and the conformity on norm and custom is then refreshed. Series of this process constituted evolution.

For individuals in certain species, mutation and hybridization happen without consciousness in design. However, the law of entropy determines that it is the destiny of all organisms and organizations to pass on the genes of their species. Despite of the individual differences, the collective behavior of survival is strongly oriented and well designed. Mutation and hybridization are apparatuses of evolution, in the other words, are powerful tools of innovation.
定义

**Mutation**
Pronunciation: mjuˈtʃən
Function: noun
Date: 14th century
1. a significant and basic alteration: change
2. umlant
3 a. a relatively permanent change in hereditary material involving either a physical change in chromosome relations or a biochemical change in the codons that make up genes; also: the process of producing a mutation b: an individual strain or trait resulting from mutation
- mutational /ˈmjuːʃənl/ adj
- mutationally adv

(Source: Merriam-Webster Online Dictionary,
http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=mutation&x=0&y=0)

1. 怪异的现象。古代多用以称人们无法解释的自然现象。
2. 谓标新立异。
3. 变化，不同。
4. 生物学名词。同种生物世代之间或同代生物不同个体之间在形态特征、生理特征等方面所表现的差异。
定义

杂交种

简称杂种。由不同遗传类型的亲本交配而产生的子代。凡有杂种优势的优良组合，即可利用其杂交一帯，作为杂交种。

杂交

基因型不同的生物体相互交配或结合而产生出杂交种的过程。

（来源：辞海。上海辞书出版社1997年版，缩印本。）

- Hybrid
  Pronunciation: 'hl-bris
  Function: noun
  Etymology: Latin hybridus
  1: an offspring of two animals or plants
     of different races, breeds, varieties, species, or genera
  2: a person whose background is
     a blend of two diverse cultures or
     traditions
  3 a: something heterogeneous in origin
     or composition: COMPOSITE <artificial
     hybrids of DNA and RNA> <a hybrid
     of medieval and Renaissance styles>
     b: something (as a power plant, vehicle, or electronic circuit) that has
     two different types of components
     performing essentially the same function
     - hybrid adjective
     - hybridism /hl-bris-iz/ noun
     - hybridity /hl-bris-iti/ noun

- Hybridize
  Pronunciation: 'hl-brisiz
  Function: verb
  Inflected Form(s): -ized; -izing
  Transitive senses: to cause to produce
  hybrids: INTERBREED
  Intransitive senses: to produce hybrids
  - hybridization /hl-bris-i-zhun/ noun
  - hybridizer noun

(Source: Merriam-Webster Online
Dictionary,
http://www.m-w.com/cgi-bin/
dictionary?book=Dictionary&va
=hybrid&x=2&y=14)
It has been a common practice to attempt to parallel cultural evolution with the theory of biological evolution.

Both Herbert Spencer (1862) and Robert Carneiro (1970) defined evolution as a change from a relatively indefinite, incoherent homogeneity to a relatively definite, coherent heterogeneity, through continuous (Spencer) or successive (Carneiro) differentiations and integrations. In 1953, Steward talked about multi-linear evolution to take care of plurality and diversity.

In 1960, Marshall Sahlins distinguished two types of evolution based on fitness determinants (Evolution: Specific and General, 1960): general evolution, the grand movement from simple to complex; and specific evolution, the change of individual cultures to their particular environmental circumstances.

Richard Dawkins (The Selfish Gene, 1976) decoded cultural evolution system with parameters of replicators and adaptiveness, and tried to simulate the model of cultural transmission through genetic/memetic replica. In contrast to conventional ways of understanding cultural promulgation, Dawkins’ introduction of Meme Theory removed the factor of conscious choice, making the process simply mechanical.

Their theories have been constantly challenged by many scholars in later years, mostly for the impossibility of measuring advancement among different cultural entities, for taking external force (beyond human society) as the only and final will of selection, for setting adaptiveness as the ultimate goal of existence for cultural entities, and the danger of leading to cultural chauvinism.

Despite the differences and questionable issues in theory and methodology, all of these scholars agreed on the direction of the evolution: an increasing order and complexity over time. It is now recognized not only as the direction of evolution (natural or social), but also as the goal of any conscious human intervention in the process.
This effort of productive intervention has been well seen in both biological and cultural realms. In the biological field, human beings have been employing genetic control since long time ago in attempt to generate new desirable species. Crops and fruits are cultivated and improved not only by enhancing the quality and quantity of the external supply, but also by optimizing the genetic configuration through hybridization and selective mutation. A well-known example is the long history of dog breeding. In order to develop new breeds that contain desirable combination of the phenotypes, breeders hybridize between different breeds of dogs, and between dogs and wolves. As Canis lupus (wolf) and Canis familiaris (dog) are the same species, “hybrid” is an inaccurate term in this case, yet the crossbreed mix shows the obvious operation of hybridization on the genetic level.

In the field of cultural study, many cases demonstrate that cultural entities have the awareness of cultural differences and dominances and their specific positions in time and space, and keep initiating changes and adoptions on the way of evolution.

With cultural migration and colonization, as well as import and export, mutation and hybridization occur all the time. In a polarized global structure, the cultural transmission appeared to be more of a one-way distribution system, while in fact the conveyance in reverse direction has also played a significant role in formation and reformation of the dominant culture. Examples include: when Buddhism, as a foreign (Indian) religion, took dominance in China; blues and jazz from black artists induced modern music (America); rise and fall of the communism in last century; and postmodern cultural and social theories built on queer theory and feminist theory.
Cultural dominance is a result of technological advance; there is not a universal, absolute measurement for cultural advancement. Cultural relativism places a significant value on cultural diversity, and advocates respect and freedom among different cultures (Elvin Hatch, Culture and Morality: The Relativity of Values in Anthropology, 1983). As a Chinese woman studying in U.S. with cultural awareness, I observed the confrontation and negotiation among different values, ethnicities, religions and lifestyles, and as a result, the increasing diversity and hybridity of the American culture. New York City and Los Angeles are living examples of the attainment of more cultural vigor from the complexity and diversity of their cultural components.

I uphold the cultural relativist point of view that all cultural entities are equally valuable in the evolutionary process of human society, and that cultural diversity is essential to the further development of human civilization. In this sense, as a huge combined genetic/memetic pool, both dominant and non-dominant cultures have a lot to offer for the future evolution. Also in this sense, a productive intervention in the mutation and hybridization process of cultural entities (in this case, architecture) is well plausible.

After all, this is a position held against the utilitarianism in culture, and against the passive notion of "natural" selection in the realm of cultural evolution theory. It is a belief that by self-sublation, by keeping absorbing foreignness, and by keeping "becoming" foreign, the essence of being gains the ultimate dynamics.
定义

杂种优势

两个基因型不同的生物体杂交产生的杂种第一代，在生长势、生活力、繁殖力、抗逆性、产量和品质等方面比其双亲优越的现象。

（来源：辞海。
上海辞书出版社1999年版，缩印本。）

DEFINITION

*Heterosis
(also called hybrid vigour)
the increase in such characteristics as size, growth rate, fertility, and yield of a hybrid organism over those of its parents. Plant and animal breeders exploit heterosis by mating two different pure-bred lines that have certain desirable traits. The first-generation offspring generally show, in greater measure, the desired characteristics of both parents. This vigour may decrease, however, if the hybrids are mated together; so the parental lines must be maintained and crossed for each new crop or group desired.

PART II: THE HAND FAN PROJECT

Exploring The Genetic Process Through Hand Fan Design

To set up a template for genetic study of the design process through mutation and hybridization, I chose a simple object - the hand fan - as a starting point.

My intent is to examine what kind of formational forces from the culture and technology are taken into account in the changes in the design - structure, form, function, material, image, and cultural implication. Then in a simulated design process, responding to current external influences and determinants, new hand fan designs will be generated through mutation and hybridization of hand fan genes from the decoded native and foreign genetic pool.

I choose the hand fan as the object of study for many reasons. On the surface, it seems that the hand fan is a lot different from architecture. But a second look makes the two cases a lot similar. First, they both involve formal and structural design. Second, they both started as a religious or governing apparatus and ended up as pop art products. Third, through the history, they are both deeply involved in cultural and technology evolution. Forth, they all migrated through regions and cultures and experienced foreignization and domestication in physical and cultural configurations. More over, both of them transcended the role of device and perform as a symbolic representation of the culture their styles originated from. Lastly, they both have always been re-interpreted by the local culture that accepted them as an imported/immigrated foreign cultural product, despite what the original intentions of the design truly were.

Now we see that, from historical and structural view of the evolution, the hand fan and architecture do appear to be a pair of comparable design issues - with their paralleled histories of formation and reformation through mutation and hybridization.
Vannus - fan

**Folding Fan** - made from a set of sticks with a pleated leaf. The two outer sticks are described as guards and they are frequently decorated. The guards and sticks are held together at the base with rivets.

**Hand Screen** - a rigid fan, square or circular, mounted on a stick. These fans have a long history in Asia and are the sole type of 'palm leaf' fan. The earliest type of fan known.

**Fixed Fan** - a type of fan that has a flat surface attached to a single handle. This fan is also called a Hand Screen.

**Flag Fan** - like the name describes. They are fans on a stick with either a heart, spade or circular shaped stiff leaf with a stiff handle running down the side (see illustration at top of page). They were fashionable in Venice in the 18th century and are still made in the Indian sub-continent.

**Cockade Fan** - a fan has a folding leaf designed to open into a full circle and it closes into a single guard.

**Briese Fan** - a fan with no leaf, but made of rigid, overlapping sticks held together at the base by a rivet and at the top by a ribbon, cord, or similar material.

**Jenny Lind Fan** - a briese fan with fabric cut like feathers or petals and mounted on sticks. There's often an edging made of Marabou feathers at the top of the fan. This style fan became fashionable during the popularity of the vocalist Jenny Lind.

**Cabriole** - a fan with two sometimes three concentric leaves.

**Fontange Fan** - a shape of a folding or briese fan that is shell shaped, with the center longer than the guards.

**Leaf** - the main body of the folding fan is usually made of paper, fabric, lace, or skin. It can be either single or double sided and is either sewn or glued to the ribs. This is sometimes called the mount.

**Guard Sticks** - the front and back outer sticks that show when the fan is closed and are usually more embellished than the sticks.

**Gorge** - the area immediately below the leaf, extending from the shoulder of the sticks to the rivet area or head. Briese and folding fans can both have a gorge section. On a briese it is formed by the shaping of the fan's profile or can be created by painted or carved decoration. The gorge separates the fan into two distinct areas.

**Head or Rivet Area** - The rivet area is the part of the fan which rests in the hand when the fan is open. A rivet passes through the head of the fan, allowing the fan to articulate into open and shut states.

**Loop** - a small half round of metal or other material that is attached to the rivet. Loops are common in 19th century fans.

[Sources:
History of Fan: http://www.diborny.edu/cl3158/ta341/1005.html
Generally speaking, there are two major types of hand fans: hand screen fans and folding fans. A hand screen fan is a rigid fan, square or circular, mounted on a stick. These fans have a long history in Asia, and are the sole type of "palm leaf" fan. It is the earliest type of fan in world. A folding fan is made from a set of sticks with a pleated leaf. The outer sticks are described as guards and they are frequently decorated. The guards and sticks are tied together at the base with a rivet.

According to the very scarce prehistory evidences we have, hand screen fans have two different origins, one in Ancient China, and another one in Ancient Egypt (see diagram on page 22). The ancient screen fans from two origins were basically very similar to each other in form and construction: a thin, flat and flexible sheet-like object (made of a palm leaf, a cluster of feather, or a sheet of woven straw) attached to a straight rigid handle (normally made of wood or bamboo sticks). And in both cultures, screen fans were assigned first as a ritual device rather for daily cooling purposes.

The folding fan was invented by the Japanese in approximately 200 B.C. The first folding fan is consisted of a set of narrow plates made of wood skin that overlapped at the wider end and tied together at a rivet at the narrower end. Later the making of folding fans became a two-part structure: a set of sticks tied at rivet that functions as a rigid movable skeleton, and a mounted paper/fabric sheet as the surface. The new fan type was soon introduced to China (around 440 B.C.). Reaching its peak of prosperity in the world at that time, China brought high quality silk and precious stick materials into the fan-making, and high art (painting, calligraphy and poetry) onto the surface of folding fan (as pop paintings were previously applied to the surface of screen fan). The number and density of the ribs increased, with more varieties provided in design of the degrees of openness - arranged from 60 degree to 90 degree, then 120, 180 and even 210 degree. The improved form soon became a fashion, and was re-imported back to Japan, as this Chinese version of folding fan became a status symbol embraced by the elite class and was extremely popular in Japan at that time.
The Silk Road (started 200 B.C.), the Naval Expedition in Ming Dynasty (six times around 17th century), the Opium War (1840-1842 A.D.), and the First and Second World War all built up the major channels of trade and cultural exchange between East Asia and the western world. On the timeline diagram (page 22, and appendix ###) it is evident that a significant amount of new designs originated around 17th century, right after Asian screen fans and folding fans were introduced to Europe and became popular merchandise in the trade. Hand fan designs on both sides showed obvious evidence of hybridization among Chinese and many European cultural entities, in form, use, method of making, material, graphic, and social gesture in hand fan culture.

With the unprecedented thriving of popularity, hand fans soon became part of the classical symbolic system and developed very detailed social syntax along with its complex representation in class, gender, culture, profession, and personal gesture. The system reached its peak along with the peak of the summit of the feudalist civilization in Asia. After the beginning of modernization movement, the hand fan culture was gradually detached from the highly hierarchical social system it originated from, and flattened down to a simple souvenir that carries the graphic flavor of traditional Asian culture. For the same reason, just as other classical designs, the majority of the hand fan designs stay indulged in its golden days and is bonded to its aesthetic and cultural obligations of that age.

If along the time axis the development on fan design corresponds to the mutational progresses (along with development of civilization in that society), then the orthogonal axis across geographic territories through exchange channels (such as free trade, cooperation, immigration, war, and tourism) can be considered the path series of the hybridizational progresses.
Findings in the Hand Fan Evolution

1. The functional role of hand fans changed from a ritual device to a cooling device, to an apparel accessory, and to a classical symbol of specific cultures.

2. The availability of materials and the social cost of fan making determined fan’s class distribution.

3. The evolution of the form and material shows the mutative adaptation to local lifestyles, craft traditions and natural resource of materials, and later in history the use of modern material and technology.

4. Hand fans were designed with explicit cultural covenant for the use of different class, gender, occasion, and nationality. These hand fans functioned as labels of social identification.

5. The evolution of the use of hand fan diverges. Both gesture/semiotics and utility/popularity obtained thorough development.

6. In the latest evolution stage, with relatively standardized formal categories, hand fans presented diverse cultural identities through graphic representation.

7. Hand fans are still in the endless process of mutation and hybridization. The ongoing transformation is less visible because it is less and less about formality. Hand fans eventually became a medium of cultural publication, through the text and images embedded.

[see also:  
Appendix 1-a. Index of hand fan typology.  
Appendix 1-b. Hand fan evolution timeline in detail (changes and incentives).]
Design Simulation
(Hand fan design, applying mutation and hybridization process)

With inventing through genetic mutation and hybridization in mind, I started a design simulation with hand fans to further explore this particular design process.

Looking back to the research on the entire evolution timeline of the hand fan, I see the hand fan's current position in evolution as continuous transition from a cooling device towards a medium of cultural expression. Thus the goals of new hand fan design could be either creatively promoting this transition, or creatively diverting this unidirectional transition. Holding a pro-diversity philosophy, in this design simulation I attempted to achieve both. In order to induce the most unexpected innovation for the maximum possible diversity, I even tried intentionally putting together genetic characteristics from the opposite categories (such as high art contents and mass production).
External driving forces I looked into include:

-- Main stream design philosophy: art as expression of ideas, deviation from normality, emphasis on novelty and diversity;

-- Social demand: multi-function, multi-identity, cultural representation, cross-cultural communication, individuality;

-- Technology: modern material and making techniques;

-- Economy: mass production, mass consumption.

Thus I started the mutation-hybridization design simulation:

1. Decode hand fan's genetic control system;

2. Invent through Intervention:

   i. Design hand fans through recombining existing genes (mutation and intra-specie hybridization; hand fan design #2, #3)

   ii. Design hand fans through decomposing genes (mutation; hand fan design #1, #5)

   iii. Design hand fans through modifying domestic genes and importing foreign genes (cross-specie hybridization; hand fan design #6, #7)

   iv. Design hand fans through redefining the concept and employment of hand fan (cross-specie hybridization, alienization; hand fan design #4, #8)
DESIGN THROUGH MUTATION AND HYBRIDIZATION: THE HAND FAN CASE
screen fan design group 1:
experiment on skeleton, surface and texture relationship
screen fan design group 2: reversed material, structural and visual configuration
hand fan design 3:
be both flag fan and folding fan.
be curvy, be fury.
hand fan design 4:
be both screen fan and folding fan,
be fan, be book pages, and be screen,
be transparent, and be visible;
multi-panel, multi-leaves, multi-layers of presentation,
revealing through folding, performing through unfolding.
hand fan design 5:
single material design,
be random, be curvy.
be multi-layer, be complex.
be pleated, be folded, be woven, be fixed.
screen fan design 6:
be screen fan, be hand bag.

screen fan design 7:
be screen fan, be flash light.
They turned her around, until the heel of the fire was against her back. Her hand seized one of her breasts, a loop fastened on the tip of the other. She suddenly lost her balance and fell backward (supported by whose arms?), while they opened her legs and gently spread her lips. Hair grazed the nates of the finger. She heard them saying that they would have to make her kneel down. This they did. She was extremely uncomfortable in this position, especially because they forbade her to bring her knees together and because her arms pinned behind her forced her to lean forward. Then they left her rock back a bit, as nuns are wont to do.

"You've never tied her up?"

"No, never."

"Are you ever whipped her?"

"No either. But as a matter of fact..."

her lover speaking.

... i read the lines... between the lines, i see the face of myself."
The Work Template for the Mutation-Hybridization Design Process
extracted from hand fan design for architecture design

Invention Through Interventions In Mutation and Hybridization

1. Define the goals of the project (e.g. design with hybridization and mutation, and to promote cultural hybridity and mutation).
   b. Define external driving forces, issues and needs (natural/environmental, social/cultural, technological, economical, personal, etc);
   c. Define concept of native and foreign in particular space/time/culture context of the site/project (fan: traditional Asian style as native; else as foreign);
   d. Determine desirable characteristics/features to pursue (unusual combination of form and function).

2. Identify applicable genetic features (case specific).
   a. Identify the native species and the foreign species (case specific);
   b. Identify the native elements that are implicated in the goal/site (case specific);
   c. Identify internal potentials of the defined native/foreign elements (case specific);
   d. Select applicable foreign species (with desirable genetic features);
   e. Encode genetic constitutions for both native and foreign species (case specific);
   f. Look at foreign and native elements across categories of organization, behavior, program, semiotics, tectonics, material, texture, image and form, to identify areas across which the two are comparable, define parameters using these comparable zones for operations of hybridization and mutation.
3. Define mutative processes for each of the applicable genetic groups.
   a. Determinants: (according to the goals and objectives defined above) enhanced performance; innovative form; advanced organization;
   b. Rules of mutative process: imposition of control on the parameters of variables so that each interested genetic component and the entire genetic composition of the subject are both optimized.

4. Define hybridizing processes for each of the applicable cross-specie genetic recombination.
   a. Determinants: identified needs; projected trends; desirable characters; innovative combination; multiplication of capacities;
   b. Rules of hybridizing process: creating new species through seeking the genetic otherness from alien species and making them assets in fulfilling needs, impelling potentials and highlighting uniqueness.

5. Apply mutation and hybridization to these genetic groups according to the processes defined.

6. Integrate the organizational, behavioral, programmatic, semiotic, tectonic, material, textural and formal outcomes into architecture.
PART III: THE FOREIGN EXPERIENCES

Context and Goals of Mutation and Hybridization in Architecture

In this and the following chapter, I will put the proposed mutation-hybridization working template into the context of cross-cultural architectural and urban design, re-examine its compatibility with the North American socioeconomic reality and its capacity to initiate architectural innovation and cultural vitality, and prepare it for future application in similar cross-cultural circumstances.

Any attempt of interfering with a natural process should begin with scrutinizing internal mechanisms of the progress and the interactive relationship between the subject and its surroundings, including this proposed mutation-hybridization design process. It is crucial to the success of this design process that one understands the ongoing mutation and hybridization progresses in the target area, and identifies the dominant driving forces taking effect in the process. Given the substantial size of the combined typological genetic pool, for the proposed template to be applicable in a specific design project, one has to define the objectives of mutation and hybridization before trying to select applicable genes and looking into the options of genetic combination. This study on site and its socioeconomic context will help eventually lead to the point of readiness.

The following is an investigation on foreignization and domestication in architecture and lifestyles in the multi-ethnic, multi-cultural communities of the study area. The first session introduces the criteria of selecting the site and the establishing goals for the architecture project; the second session focuses on experiences of mutation and hybridization in cultural transmission; and the third session focuses on the current mutating and hybridizing phenomena in architecture and urban configuration.
STUDY AREA SITE MAP
Background Map: Harris County % of Asian Population, 2000
(Source: U.S. Census Data)
Selecting the Study Area and Initiating the Architecture Design Project

In this specific design project, the purpose of the architectural product is to testify and demonstrate the process of design through mutation-hybridization. Thus, to select a site is in fact to define the cultural and economical circumstances that need and favor intensified mutational and hybridizational operations the most. All the objectives and programs of this architectural product should be therefore determined according to the comprehensive socioeconomic context it is situated in.

A multi-racial, multi-cultural community in the Greater Houston Area, Alief, was chosen as the interested area. Based on an overall study on the regional setting and the current status of this community, a cross-cultural communication project was proposed, and then a specific site was selected for the best fulfillment of the project and the best interest of the community.

The selection of the site lays out a foundation for in-depth study of the mutational and hybridizational context. Demographic and geographic milieu in Alief community offers great opportunity of observational research and experimental design with mutation and hybridization. Located in a multi-cultural multi-racial metropolitan area like Greater Houston, the Alief community is featured with well-mixed population of different race, origins and lifestyles; a noticeable on-going mutation and hybridization in race, culture and architecture; and typical North American suburban automobile-oriented land use characteristics. The Asian-dominance of the community also allows me to take advantages of my familiarity with Asian culture and Asian architecture, which are very important in setting up the domestic-foreign referential system for the mutation-hybridization design process.
The Area and Its Cross-Cultural Experiences

The greater Houston area is composed of various ethnic-based and origin-based communities. U.S. Census data shows that in recent decades, the level of blending is steadily increasing. According to the 1990 U.S. Census data, in 1989 with a total population of 2,818,199, 54% of the population in Harris County were Non-Hispanic White, 19% were Black, 23% were Hispanic, and 4% were Asian. Among all minority populations in 1989, 22% were foreign-born persons. The 2000 census data shows an even more diversified ethnic composition: among total of 3,400,578 people (an 20% increase from 1989), 42% Non-Hispanic White, 19% Black, 33% Hispanic, and 5% Asian. Additionally, 3% (100,652 persons) of the population were of two or more races. Among all minority population in 1999, 22% are foreign-born persons.

In the vicinity of the selected site, the 1990 census showed that averagely among these census tracts, 16% of the population were Non-Hispanic White, 24% were Black, Hispanic 10%, and Asian 50%. The 2000 census data of the same area showed a composition of 14% Non-Hispanic White, 22% of Black, 24% of Hispanic, and 40% of Asian. Of the net population change, the non-Hispanic White population slightly decreased, while populations of all other races increased through the last decade. The percentages changed such that no one race constitutes more than half of the total population.

In the greater Houston area, spatial distribution of population by income is in a concentrated ring pattern, and spatial distribution of population by race and origin is in a radiate pattern from inner city towards suburbia along major highway spines. It shows that population with similar cultural or economic characteristics tend to stay in vicinity in geographic areas. Yet the spatial distribution pattern for cultural and racial groups tends to break down into multi-center clusters in recent years, due to the fast growth in population and expansion of the geographic area and the virtual communication channels provided by Internet technology.

Cross-cultural experiences in this region are far different from what have been observed in other racially and culturally diversified areas. With such a significant presence of various cultural and racial groups, Greater Houston area currently does not have geographic areas that can be called physically a Chinatown, a Mexican Town, or any such with a strong presence of a center and a cultural domain in spatial and architectural configuration. Social activities within certain groups take place in two levels: in forms of various associations or clubs, or in forms of virtue communities that do not appear as definable geographical areas but with a clear yet non-spatial ties from the cultural consensus. The former level is a traditional model of group communication, which was once the only means over the past and was still largely used by people with geographic vicinity and private ties. In the latter model, group communications happen via more express but less physical channels: by mass media, publications, and news groups, mailing lists and discussion forums on the Internet.

Experiences, information and ideas have been shared over these two models of intra-cultural communication, without visualized cultural symbols like a main street with dragon wall and Chinese Pailou (decorative archway in classic Chinese architectural style), or a Mexican plaza with adobe pyramids and Maya totem images. Though many people with a strong tie to their cultural origins may claim it is a disconnection from tradition and cultural identity, I see in this situation there is a great chance that people are set free from the formalist bond to their foreign origins, and are granted with a more open and in-depth opportunity of observing the internal constitution in the cultures and the traditions of each other.
In Greater Houston, where there appears to be an obvious lack of cross-cultural communicating facilities, shopping becomes one of the prominent conduits that brings various parties to the confrontation of foreignness. In Houston area, even national chain stores like Kroger, H.E.B. and Wal-Mart carry special foreign or ethnic goods that are not normally in the standard merchandise distribution list. In addition, there are stores like Hong Kong City Mall and Welcome Market that aiming specially at certain population with specific lifestyles and origins. These stores not only sell exotic goods, but also introduce to visitors the culture and lifestyles through a series of shop displays. Curiosities raised among visitors often lead to the purchasing actions, and very frequently stimulate conversations in front of the shelf or outside the store that inquire about the goods and the cultural background carried along with them.

This grass-root communication is freed from propaganda in the mass media and the closed circle of social networking. This cross-cultural progress happens in a less perceptive but more profound way, in the sense that no values or lifestyles could be imposed without a willing consensus expressed in form of a purchasing agreement. The indirect communication among cultural entities in the series of shopping actions plays a significant role in the progress of cultural evolution. Looking back to the hand fan evolution case in which technology and consumption was the ultimate driving force, I see in the cross-cultural circumstances, consumption behavior is again among the most significant determinants.

To this point I found that cultural transmission in greater Houston area is in most occasions conducted mainly through two types of means: speech and consumption. Among speech-based conveyances, mass media operates through a third party, social groups are tied back to a dominant value system, and cyber space provides direct yet non-personal group communication. Consumption-based conveyances, however, is largely driven by the law of economy, and are thus the uneventful events that building up our lives - the superstructure of culture and its economic foundation.
The Area - Architecture in Mutation and Hybridization

This is an area full with on-going cases of architectural mutation and hybridization. Most of the time, there are more hybridizational progresses than pure mutational ones, due to the very diverse cultural and demographic profile of the community. From the investigation on the existing development, a list of issues and concerns could be transformed into a list of goals and objectives, which can help direct the establishment of this specific experimental architecture design project. Then the most appropriate site for the project could be located, and the mutation-hybridization design process can begin.
On-going mutations:

(Entities and features that are evolved away from their original typology)

Most of the mutations in architecture observed in target area involve certain level of hybridization; that is, evidences of certain percent of foreign typologies.

On-going hybridizations:

. Straight replication of the representative architectural styles from its cultural origin (Chinatown, Japanese Garden);

. Resemblance of signature features of architectural style in certain cultural origin with completely different materials and methods of making (All-steel-made curvy Chinese roof with exposed quasi-bracket structures: Hong Kong City Mall);

. Collage and superimposition of architectural elements from different cultural origins (American suburban strip mall with American brick veneer, modern glass curtain wall and quasi-Chinese style roof feature);

. Partially altered spatial assignment accommodating special needs in certain lifestyle (e.g. Buddhism Temple in a typical American residential subdivision: A Zen room or a Buddhism worship alcove added to a mass-developed single-family house: a Chinese garden and water feature in front of a shopping center between parking lot and store entrances);

. Interior reconfiguration for a particular cultural expression regardless its existing architectural exterior in contrast (e.g. A very authentic Chinese interior design in a typical mass-developed American building);

. Simple labeling to claim identification (Chinese names and logos in a typical American strip mall structure, with no other alteration whatsoever).
typical strip mall development, grass storefront and flat dashing facade, with large parking area in front.

typical urban shopping center, clusters of buildings surrounded with large parking area in peripherals.

typical suburban single-family residential neighborhood, uniformed spatial configuration, homogenous architectural expression.

AREA AS AMERICAN DEFAULT
Area in Transition case #1:
no matter what styles of architecture and
decoration a building is applying, once being
labeled with foreign language, it appears
foreign immediately.

Area in Transition case #2:
the signature roof
imposing symbolic and representative
architectural elements from specific cultural
origin makes the cultural identity instantly
recognizable, but in an un-natural, pretentious
way.

Area in Transition case #3:
more, and more, and more...
mixing architectural elements from multiple
foreign styles into one single architecture
increases the exotic flavor, though the overall
operation is limited within the phenotypical level.

AREA IN TRANSITION
Area In Transition Case #4:
Copy, Paste

Harris County Flood Control Detention Park. Putting Japanese pavilions into a garden, then the garden is referred as "the Japanese Garden".

Area in transition Case #5:
Place to Go

Harris County Flood Control Detention Park. Public parks and open spaces are extremely precious in Houston area. They are the places stimulating cross-cultural conversations.

Area In transition Case #6:
A Success

Hong Kong City Mall. A place offers the joy of shopping not only through its specialties in Asian goods, food, service, architecture and landscape experiences, but also through its creating of a place, a support of a hybridized lifestyle, and a tie to the people alike and unlike.
These mutation and hybridization cases in architecture expressed the intuitive architectural reaction under cultural and economic forming forces in these communities:

1. Demand immediate imagery recognition of the cultural identity;
2. Claim group consensus with the population of the same cultural origin;
3. Offer alternative visual languages and thus architectural diversity;
4. Reinforce the cultural prototyping so as to avoid cultural homogeneity and the loss of cultural individuality.

Following are the findings in architectural design issues from this investigation:

1. Disengagement of architectural style and the construction typology it is originally designed to complement;
2. Disengagement of architectural style and the lifestyle it is originally designed to serve;
3. Disconnection between the pro-action, pro-growth philosophy shared by the majority of the society and the nostalgic, retrospective attitude towards architectural appreciation;
4. Foreign-originated cultural entities are overwhelmed by domestic dominant ideology, even in the area that minorities are the majority;
5. The driving forces of these mutation and hybridization: capitalist economy and cultural consciousness;
6. Superficial interpretation of cultures with only imagery differentiation and recognition;
7. Problem of cultural stereotyping and flattening;
8. Collage, mixture, and fusion among different entities do not naturally lead to a hybridization, which requires intentional and conscious hereditary operations and deeper understanding of the internal formation of the architecture.
Therefore in reaction, a list of solutions that need to be found (goals and objectives for the architectural design to strive for):

1. An architecture that serves both contemporary American lifestyles and specific cultural representation;
2. An architecture that presents unique cultural preference while using universal and contemporary materials and building technology;
3. An architecture that is both innovation and reflection;
4. An architecture that participates and promotes multi-cultural development and cross-cultural communication;
5. An architecture that respects freedom of speech and values diversity.

Thus We Need:
1. A design philosophy that works with cultural transmission, domestication and foreignization;
2. A guiding design process that directs towards architecture and urban design outcomes fulfilling the goals and objectives above.
Thus the architectural project is established, based on all the findings above:

A “Houston Trans-Culture Center”

And the goals of the design outcome:

1. The Trans-Cultural center is designed through the mutation and hybridization process.
2. The architecture of Trans-Cultural Center is a mutant, a hybrid between classic Asian architecture and modern American urban norm, and between building tectonics and media publication.
3. The Center is a mutated “center” programmed to facilitate cultural communication and hybridization. It’s a hybrid of education and consumption.
4. The building of the center is a processing program of mutation and hybridity in trans-cultural communications.

The Site chosen in the study area to fulfill the best interests of the community and to expect the best outcomes from the mutation-hybridization design process.

It is an undeveloped land parcel that is located:

- Adjacent to other major activity centers
- Within the multi-cultural, multi-ethnic community
- On Bellaire (major thoroughfare) and close to Belt 8 (Expressway)
- Adjacent to Home Depot (big box retail, regional shopping destination)
- By the Brays Bayou (regional water feature)
- On the Bayou Park Trail (regional green pathway)
- Harris County Flood Control Detention Park (regional attraction)
- On the other side of the Bellaire facing Halliburton Headquarter (regional employment center)
- On the way from central city to Hong Kong City Mall shopping center (2 blocks away, regional shopping center, regional attraction)
PART IV: A MUTANT AND HYBRID ARCHITECTURE

Developing The Genetic Process Through An Architectural Design: The Houston Trans-Cultural Center
## Houston
### International Metropolis

<table>
<thead>
<tr>
<th>Issues</th>
<th>External Shaping Forces</th>
<th>Group Self Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economy</td>
<td>Restructured Economy</td>
<td>Professional/Managerial</td>
</tr>
<tr>
<td>Immigration &amp; Ethnic Diversity</td>
<td>Demographic Revolution</td>
<td>Minority</td>
</tr>
<tr>
<td>Discrimination &amp; Affirmative Action</td>
<td>Sustainable Diversity</td>
<td>Racial Distinctions</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>Suburbanization</td>
<td>Settlement</td>
</tr>
<tr>
<td></td>
<td>Immigration and Naturalization</td>
<td>Americanization</td>
</tr>
<tr>
<td></td>
<td>Increasing Cultural Consumption</td>
<td>Cultural Distinctions</td>
</tr>
<tr>
<td>Transportation</td>
<td>Expansion of the Highway System Development of Public Transit</td>
<td>Increasing Mobility</td>
</tr>
<tr>
<td>Environmental Concerns</td>
<td>Flood Control</td>
<td>Brownfield Redevelopment</td>
</tr>
<tr>
<td></td>
<td>Ecological Healthiness</td>
<td></td>
</tr>
<tr>
<td>Regional Identity</td>
<td>Further Internationalization</td>
<td>Regional Center</td>
</tr>
</tbody>
</table>

## Site
### Multi-Ethnic, Multi-Cultural Suburb

<table>
<thead>
<tr>
<th>Geography</th>
<th>Demographic Profile</th>
<th>On-Going Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Ethnic Component:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% (2000): Change</td>
<td>Direction</td>
</tr>
<tr>
<td></td>
<td>White: 14%</td>
<td>-2% Out</td>
</tr>
<tr>
<td></td>
<td>Black: 22%</td>
<td>+2% In</td>
</tr>
<tr>
<td></td>
<td>Hispanic: 24%</td>
<td>+14% In</td>
</tr>
<tr>
<td></td>
<td>Asian: 40%</td>
<td>-10% In</td>
</tr>
<tr>
<td>Occupation:</td>
<td>Professionals: 40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Business Owners: 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Labor: 35%</td>
<td></td>
</tr>
<tr>
<td>Income:</td>
<td>Medium Household Income: 30,000-75,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>People Under Poverty Line: 400-800</td>
<td>(Vary by Census Tracts)</td>
</tr>
<tr>
<td>Family Structure:</td>
<td>80% More Than 2 Children</td>
<td></td>
</tr>
<tr>
<td></td>
<td>37% Extended Family</td>
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<td></td>
<td>Increasing Population</td>
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<td></td>
<td>Increasing Growth in Economy</td>
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<td></td>
<td>Increasing Diversity</td>
<td></td>
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<tr>
<td></td>
<td>Increasing Asian Dominant</td>
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<tr>
<td></td>
<td>Increasing Collision Between Cultures</td>
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<tr>
<td></td>
<td>Increasing Cultural Consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increasing Communication</td>
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</tbody>
</table>

### What's Missing
- Direct Channel of Cross-Cultural Communication
- Public Spaces for Cross-Cultural Interactions
- Spatial and Architectural Identity for Culture and Lifestyle
### Mutations

**Being and Becoming**

#### What’s Mutating

<table>
<thead>
<tr>
<th>Psychological Map of “Ethnic Community”</th>
<th>Psychological Component of “Ethnic Community”</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Space-based → Culture-based)</td>
<td>(Race-based → Culture-based)</td>
</tr>
<tr>
<td>Spatial Organization of “Ethnic Community”</td>
<td></td>
</tr>
<tr>
<td>(Center, zone, and continuity defined → undefined, fluid, mobile and decentralized)</td>
<td></td>
</tr>
<tr>
<td>Idea of Ethnicity, Cultural Identity &amp; Foreignness</td>
<td></td>
</tr>
<tr>
<td>Concept of Authenticity, Origin, and Catagory</td>
<td></td>
</tr>
<tr>
<td>Cultural and Racial Component of America</td>
<td></td>
</tr>
<tr>
<td>Self-Identification of Americans</td>
<td></td>
</tr>
<tr>
<td>Use and Characteristics of Space (Addition of Ethnic Cultural Identities, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

#### What’s to Mutate

<table>
<thead>
<tr>
<th>Spatial Organization of “Ethnic Community”</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Natural formation → Conscious &amp; Productive Intervention)</td>
</tr>
<tr>
<td>Communication Model Between Different Ethnic Groups (Event-based → Institution-based)</td>
</tr>
<tr>
<td>Homogeneity in Lifestyle and Spatial Configuration (Illusion of Diversity → Dynamic Diversity)</td>
</tr>
<tr>
<td>Attitude Towards Foreignness (Reactive → Interactive; Exclusive → Inclusive; Respecting → Understanding → Absorbing; Collaging → Merging)</td>
</tr>
</tbody>
</table>

### Hybridization

**Being and Becoming**

#### What Are Hybridizing

<table>
<thead>
<tr>
<th>Psychological Maps of “Ethnic Community”</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Single identity → Multi-identities)</td>
</tr>
<tr>
<td>Spatial Organizations of “Ethnic Community”</td>
</tr>
<tr>
<td>(Single, recognizable zones → Overlaying, Multi Networking)</td>
</tr>
<tr>
<td>Ethnicities, Cultural Identities and the Foreignness</td>
</tr>
<tr>
<td>Concepts of Authenticity, Origin, and Catagory</td>
</tr>
<tr>
<td>Self-Identifications Defined as “American”</td>
</tr>
<tr>
<td>Uses and Characteristics of Space (Addition of Ethnic Cultural Identities, etc.)</td>
</tr>
</tbody>
</table>

#### What Are to Hybridize

<table>
<thead>
<tr>
<th>Cultural Components in “Ethnic Community”</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Racial and Cultural, Foreign and Domestic)</td>
</tr>
<tr>
<td>Spatial Organizations of “Ethnic Community”</td>
</tr>
<tr>
<td>(Natural formation and Conscious &amp; Productive Intervention)</td>
</tr>
<tr>
<td>Communication Media and Patterns Between Different Ethnic Groups (Event-based and Institution-based)</td>
</tr>
<tr>
<td>Lifestyles and Spatial Configurations (Not merely mixture and collage, but to Hybridize to Obtain Hybrid Vigor)</td>
</tr>
<tr>
<td>Architecture, place, lifestyle, instrument, media, institution, advertisement (to invent one entity that performs multi-roles and fulfill multi-purposes)</td>
</tr>
</tbody>
</table>
### TRANS-CULTURE CENTER
**BEING AND BECOMING**

<table>
<thead>
<tr>
<th>ISSUES</th>
<th>PROGRESS</th>
<th>DESTINATION</th>
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<tbody>
<tr>
<td>CULTURAL IDENTITY</td>
<td></td>
<td>SELF IDENTITY</td>
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<tr>
<td></td>
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<td>CROSS-CULTURAL</td>
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<td>TRANS-CULTURAL</td>
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<table>
<thead>
<tr>
<th>PROGRAM</th>
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<th>ARCHITECTURE AS PUBLICATION</th>
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<tbody>
<tr>
<td>TRANS-CULTURAL ARCHITECTURE</td>
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<td>INTERNAL COMMUNICATION</td>
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<td>PUBLIC EVENT GATHERING</td>
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<td>CROSS-CULTURAL COMMUNICATION</td>
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<tr>
<td>EXHIBITION</td>
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<td>CULTURAL CONSUMPTION</td>
</tr>
<tr>
<td>EDUCATION</td>
<td></td>
<td>CULTURAL PRODUCTION AND EVOLUTION</td>
</tr>
<tr>
<td>ENTERTAINMENT</td>
<td></td>
<td>REGIONAL DESTINATION</td>
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<tr>
<td>SUPPORTIVE RETAIL AND SERVICE</td>
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<tr>
<th>ARCHITECTURE</th>
<th></th>
<th>OTHERNESS</th>
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<tbody>
<tr>
<td>SITE CONFIGURATION</td>
<td></td>
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</tr>
<tr>
<td>SPACIAL ORGANIZATION</td>
<td></td>
<td>INVENTION AND EVOLUTION</td>
</tr>
<tr>
<td>MOVEMENT AND EXPERIENCE</td>
<td></td>
<td>ALTERNATIVE / DIVERSITY</td>
</tr>
<tr>
<td>MATERIAL AND TECHNOLOGY</td>
<td></td>
<td>INCLUSIVE</td>
</tr>
<tr>
<td>FORM</td>
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<td>TRANSITIONAL</td>
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<tr>
<td></td>
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</table>

### TRANS-CULTURAL ARCHITECTURE
**BEING AND BECOMING**

<table>
<thead>
<tr>
<th>PRESENT</th>
<th>EXTERNAL FORCES</th>
<th>DESTINATION</th>
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<tbody>
<tr>
<td></td>
<td>MASS PRODUCTION, GLOBALIZATION &amp; LOSS OF IDENTITY</td>
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<tr>
<td></td>
<td>MULTIMEDIA COMMUNICATION</td>
<td>ARCHITECTURE AS IDENTITY</td>
</tr>
<tr>
<td></td>
<td>REPRESENTATIVE</td>
<td>ARCHITECTURE AS LANGUAGE</td>
</tr>
<tr>
<td></td>
<td>ARCHITECTURE AS SPACIAL / VISUAL ART</td>
<td>ARCHITECTURE AS EVENT</td>
</tr>
<tr>
<td></td>
<td>IMAGE</td>
<td>ARCHITECTURE AS PUBLICATION</td>
</tr>
<tr>
<td></td>
<td>TEXT</td>
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<tr>
<td></td>
<td>HYBRID</td>
<td></td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>ARCHITECTURE AS ACCOMMODATION</th>
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<th></th>
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<tbody>
<tr>
<td>REACTIVE</td>
<td>MUTATION</td>
<td>ARCHITECTURE AS PUBLICATION</td>
</tr>
<tr>
<td>INFORMATION</td>
<td>HYBRID</td>
<td></td>
</tr>
<tr>
<td>SOCIALIZATION OF EDUCATION</td>
<td>HYBRID</td>
<td></td>
</tr>
<tr>
<td>TECHNOLOGY, TRANSPORTATION &amp; LIFESTYLE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ARCHITECTURE IN TRANSITION:
DECODING THE FOREIGN
《老子》第一章

道可道，非常道。名可名，非常名。无名天地之始；有名，万物之母。故常无，欲以观其妙。常有，欲以观其徼。此两者，同出而异名，同谓之玄。玄之又玄，众妙之门。
ROOM / BOX

Identity B  identity A

Identity B  identity A

COMMUNICATION
device: "the third one", the topic

Identity B' = f(B, a, c)  Identity A' = f(A, b, c)

NEW HYBRIDIZATION MACHINE
DEMO: MUTATION & HYBRIDIZATION
DEMO: MUTATION & HYBRIDIZATION
MUSEUM
+ GALLERY
+ SHOPPING CENTER
+ COMMUNITY CENTER
+ PARK
+ SCULPTURE GARDEN
+ BILLBOARD
+ BOOK
+ FITNESS FACILITY
+ SHADING STRUCTURE

THIS PROJECT
Demonstration Project of the Process in Action

The Trans-Cultural center is designed through the mutation and hybridization process.

The architecture of Trans-Cultural Center is a mutant, a hybrid between classic Asian architecture and modern American urban norm, and between building tectonics and media publication.

The Center is a mutated "center" programmed to facilitate cultural communication and hybridization. It's a hybrid of education and consumption.

The building of the center is a processing program of mutation and hybridity in transcultural communications.
Building Front that Serves As Billboard, Shading Structure, Lighting Fixture, and Featured Driveway.
Building Roof That Functions As Normal Roof, Continuous Part of the Park Landscape, A Sculpture Garden, A Publication, Lighting Fixture, and A Viewing Deck for Wetland Wildlives.

Skylights are Sculptures, Lighting Fixtures, permanent Exhibitions at the same time.
Exterior Exhibitions Also Function As Shading Structure, And Allow Visual Transparency At The Same Time.
Windows That Serves As Shading Blinds and Publication At the Same Time. Mildstone Pieces In Human Civilization from Various Regions and Cultures In The World Are Presented In Image, And In Both Chinese And English Languages.
Water Features Performs As Sculpture Garden, Lighting Fixture and Publication.
PART V: SUMMARY OF THE RESEARCH PRODUCT: THE WORKING TEMPLATE

THE PROCESS OF DESIGN THROUGH MUTATION AND HYBRIDIZATION

This is a revision and re-submission of the working template for the mutation-hybridization design process.

As a initiate research effort, this thesis revealed both strengths and limitations of the design process. The internal genetic potentials and external determinants are still up to the designer's arbitrary selection among numerous possible stake-taking factors. Complexity of the socioeconomic context and the non-linear nature of all research-design progress determines that under different circumstances and handled with different sensibilities, the outcome could be varied greatly. Yet, all possible results would represent interests from all parties participating the mutation and hybridization process. In this sense, no matter what specific design paths a project is taken through, the final design product will contribute to the overall diversity and evolution of human civilization in a more defined, productive, inclusive and conscious manner than ever.

Future application in a similar cross-cultural circumstances should be conducted with full awareness of the advantages and limitations mentioned above. Through this design process, simple and thoughtless superimposition, collage and implantation among cultural entities on pure phenotypic level could be avoided effectively, and the ultimate quintessence of existing genetic resources (both domestic and foreign) can thus be fully metabolized and sublated.
Conclusion

Cultural and social identities are bond together with specific history and lifestyles in certain geographic regions. Outsider and otherness are recognized as the foreign, and on both sides of the border, the sense of foreignness is mutual. With cross-cultural inter-national and being-foreign circumstances, the definitions of norm and abnormality, native and foreign are cross-referential.

The process of identifying and recognizing foreignness is a process of naming, coding and translating, in which the capture of the foreignness is unavoidably based on deconstructive understandings. The comparable native identities are used as a set of default genetic coding system.

The purpose of promoting mutation and hybridization is to maximize the utilization of the existing genetic pool in the process of evolution. There is no complete novelty as such. All inventions and creations are more or less (most probably in large percent) based on previous or existing genetic resources.

Being conscious and participative in mutation and hybridization processes is crucial for architectural invention, since Architecture belongs to category of cultural production and eventually serves as a medium of social orientation.

Mutation and hybridization in cultural innovation have been occurring all along with time and history, yet not all of them have been under close scrutiny on the microanalysis level. This thesis research is attempting to put domesticity and foreignness under a microscope, and through genetic coding and decoding, design the mutation and hybridization, and eventually lead to the innovation of architecture.

Though this design approach (design through mutation and hybridization) requires subjective judgment and individual preference in decision-making, its aim is to cherish novelty and multiplicity, rather than to define an "optimized" path for the evolution. Though it utilizes the existing or past genetic pool for mutational or hybridizational processing, the design approach is not retrogressive or nostalgic either, since it works on the essential genetic level from which the bond between external representative appearances (form and performance) and internal determinants (genetic combinations) are now seen and utilized in a completely different way. The resource typology is not borrowed or implanted in an integrated object manner (as in Post-Modernism practice), but rather in the level of micro-control and internal definition.

Almost all the design innovation approaches in architecture are more or less, consciously or unconsciously involved with mutation from and hybridization among the existing typologies. Very few of them, however, tried to intentionally and analytically look into the internal determinants and their permutational composition. This research, on the other hand, attempted to bring the issue to the surface and explore this design process through a step-by-step design application. The mutant and hybrid resulted from this process are no longer an accidentally generated aesthetic form, nor a delicately composed collage work. This evolutional leap is desired and then is designed. It becomes one of the innumerable evolutional breakthroughs occurring on the non-linear multi-path history of the development.
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City of Houston Department of Planning. “Houston Land Use and Demographic Profile”. http://www.ci.houston.tx.us/department/planning/projects/ludem/ludem.html
Appendix 1:
Houston Trans-cultural Center
bird's eye view from above Bellaire
underground parking
front facade and direct pedestrian access to the roof park from Bellaire
shaded front driveway lead to the main entrance, with landscaped boardwalk providing air and natural light for underground parking garage
interior partitions are exhibitions, and exhibitions are interior partitions
water garden as a book of artwork and literature
courtyard exhibitions are part of the landscape and shading structure.
shadows on the floor projected from skylight with literature and art images
an unfolding book
windows are also shading blinds and publications
Chinese teahouse and restaurant with a water yard
a readable water garden
APPENDIX 2-α:
INDEX OF HAND FAN TYPOLOGY
construction

bamboo

chinese palm

screen stain
APPENDIX 2-b: 
HAND FAN EVOLUTION TIMELINE IN DETAIL
1500 BC

**FAN FORM**

bamboo, wood, vine
feather, leaves

**FAN MATERIAL**
structural

**FAN GRAPHIC**

GEOMETRIC FORMS, PATTERNS AND TEXTURES

**FAN CULTURE**

RELIGIOUS/ RITUAL

1500 BC

Secrets of cultivation and fabric manufacturing of silk were closely guarded by Chinese for about 3000 years.

early Bronze-age

MATERIAL, TECHNOLOGY & ENVIRONMENT

early bronze-age

SOCIETY & CULTURE

social structure
religion
culture and art

TIME

1500 BC - 1000 BC

1000 BC

early bronze-age

classes; ruler, aristocrats, commons, and slaves

Court rituals to propitiate spirits and to honor sacred ancestors were highly developed

Language record of more than 3000 characters; writings on wood, bone plates, and seals.
### Feudal City States

In pre-literate societies, control over local governments and a more centralized agricultural mode of subsistence, Feudal City States began to emerge. This period is marked by the rise of large cities, such as Rome and Athens, which were governed by a system of feudal lords.

#### 1000 BC

- **Japanese Invention**: Folding fan
- **Function and Identity**: Shifted from ornamental to practical use

#### 500 BC

- **Silk Exported to Japan**
- **Silk Road Expansion**: Silk was transported through the Silk Road, connecting China and Europe.

**Function and Identity of Fans**
- Shifted from ornamental to practical use
- Developed as cooling devices

**Poetry, Painting, and Calligraphy**
- Appeared on the surface of fans

### 1000 BC

- **Greek Settlements in Ionia**: 753 BC, Legendary Founding of Rome
- **Homer's Iliad and Odyssey**: 7th century BC
- **Thales (624-546 BC)**: Mathematician and philosopher
- **Pythagoras (575-500 BC)**

### 500 BC

- **Plato (428-348 BC)**
- **Socrates (470-399 BC)**
- **Aristotle (384-322 BC)**

**Extents of Classical Greece**
- **500 BC**

---

**Silk Road Region**: Leads from Chang'an through Bactria to Venice, 3000 km in length.

**1000 BC**

**500 BC**

---

**105**
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 AD</td>
<td>Centralization of agriculture and industry began.</td>
</tr>
<tr>
<td>428 AD</td>
<td>Christianity adopted as the state religion in Rome.</td>
</tr>
<tr>
<td>1000 AD</td>
<td>7th century sericulture spread out through southern Europe and northern Africa.</td>
</tr>
</tbody>
</table>

**AD 454 silk cultivation secret was smuggled from China to the West.**

**Christ became popular in foreign markets.**

**Formulation of a Christian Empire: 300-527.**

**The Restoration of the Roman Empire in the East: 627-1058.**
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>1000 AD</td>
<td>Rise of cities as economic centers. Non-Confucian philosophers.</td>
</tr>
<tr>
<td>1000 AD</td>
<td></td>
</tr>
<tr>
<td>1300 AD</td>
<td></td>
</tr>
<tr>
<td>1600 AD</td>
<td></td>
</tr>
<tr>
<td>1000 AD</td>
<td>Italy starts silk industry in Europe (12th century).</td>
</tr>
</tbody>
</table>

**Rise of Cities as Economic Centers**
- Non-Confucian philosophers
- Rise of cities as economic centers
- Removal of interest in Confucian ideals and decline of Buddhism
- Effective, centrally run bureaucracy, staffed with talented scholars and officials.

**Rise of Market Economy and the Merchant Class**
- Printing and education spread.
- Mongol achievements in the arts and technology.
- Building Method published in 1303 as a government manual.
- Marco Polo travels in China (1275-1292).

**Events of the 1000s AD**
- Infrastructural improvements.
- Chinese toys and inventions spread.
- Developments in paper-making, printing, and architecture.
- Marco Polo travels in China.
- Early Islamic influence on Europe.
- Production of silk and glass became popular.

**Events of the 1300s AD**
- Increase in trade,
- Feathers, paper, linen,
- Silk industry in Europe.
- Religious paintings and decorations prosperous on fans.

**Events of the 1600s AD**
- Silk overstock in France caused harmful capital outflow (15th century).
- Italy starts its own silk industry (15th century).
- First printed books appeared (15th century), mostly religious publications.
<table>
<thead>
<tr>
<th>1600 AD</th>
<th>1800 AD</th>
<th>1900 AD</th>
</tr>
</thead>
</table>
| **1600 AD**  
| Marcus conquering Han China  
| Confucius' teachings begin  
| Mongols, Tibet, and Taiwan incorporated into China  
| Trade flourished in the Spice Route | **1800 AD**  
| Age of Turmoil: semi-feudal semi-colonial society  
| Western influences through trading, invasion, and cultural exchange frequent (market)  
| The Opium War (1839-42) by the British forced China to accept opium trade and open ports  
| The Hundred Days' Reform (1898) | **1900 AD**  
| **1900 AD**  
| The Treaty of Nanjing (1842): China ceded Hong Kong to the British  
| Self-strengthening Movement (1860s): 1866:李鸿章invented the iron industry in Shanghai  
| Chinese merchandise appeared in the World Exhibition of 1873 |  
| **1600 AD**  
| COOLING DEVICE, HIGH ART, GIFT, COSTUME ACCESSORY, PERFORMANCE  
| Silk trade prospers all over the world (18th century)  
| Eli Whitney's invention of the cotton gin, 1793  
| James Hargreaves invented spinning jenny, 1764  
| Richard Arkwright invented water frame, 1769  
| RELIGIOUS DISCORD (1428-1712)  
| Descartes (1596-1650)  
| Newton (1642-1727)  
| Kepler (1571-1630)  
| Age of Absolutism (1660-1789)  
| Rise of the Enlightenment Movement |  
| **1800 AD**  
| PRINTED IMAGES AND TEXT APPEARED BUT NOT POPULAR  
| DEMAND ON CLASSICAL ORIENTAL FOLDING FANS KEPT GROWING |  
| **1900 AD**  
| COOLING DEVICE, ARTWORK, GIFT, COSTUME ACCESSORY, PERFORMANCE  
| Japan's reeling technique made their silk import competitive  
| Japan attended the 1st World Exhibition, London, 1851  
| Jacquard weaving technique invented, 1806  
| Development of the power loom, 1844  
| Opening of Suez Canal in 1869 increased trade between Japan and Europe  
| Industrialization of silk production, and decline of the sericulture in Europe  
| **1900 AD**  
| MODERN AGE (1850s)  
| Karl Marx (1818-1883)
APPENDIX 3:
GREATER HOUSTON AREA
DEMOGRAPHIC INFORMATION