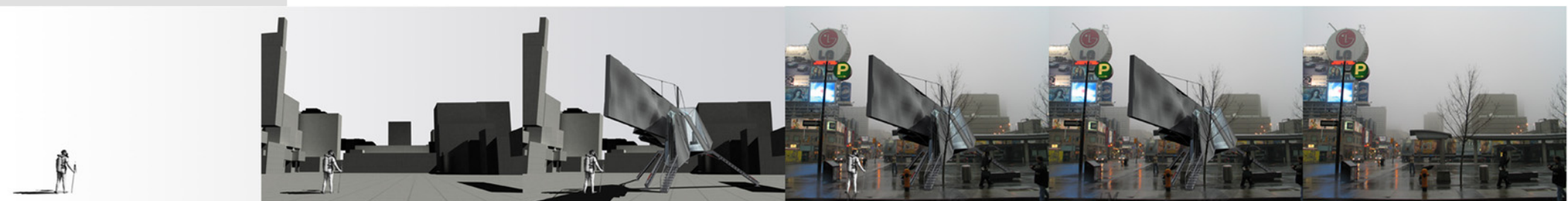
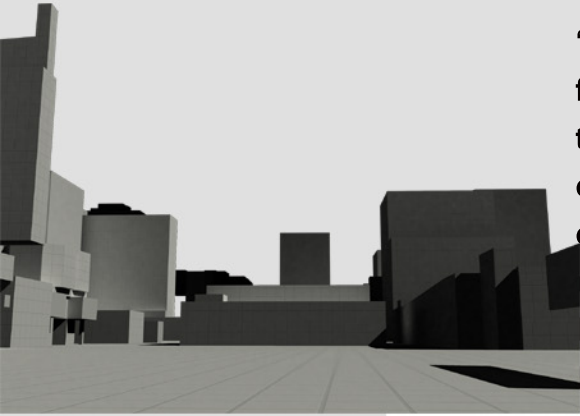


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“In Ersilia, to establish the relationships that sustain the city’s life, the inhabitants stretch strings from the corners of the houses, white or black or gray or black-and-white according to whether they mark a relationship of blood, of trade, authority, agency. When the strings become so numerous that you can no longer pass among them, the inhabitants leave: the houses are dismantled; only the strings and their supports remain.....Thus, when traveling in the territory of Ersilia, you come upon the ruins of the abandoned cities, without the walls which do not last, without the bones of the dead which the wind rolls away: spider webs of intricate relationships seeking a form.”

-Italo Calvino, Invisible Cities

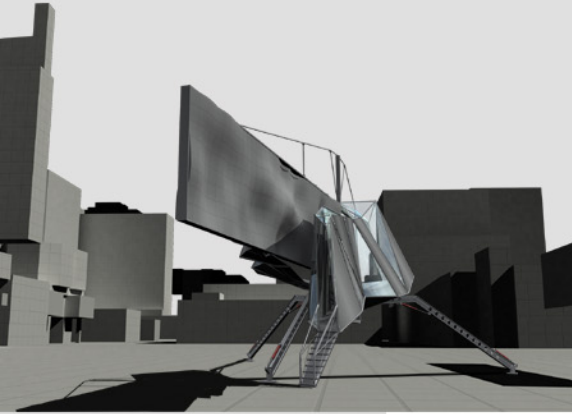
Architecture itself is about creating connections. Connections between one building and the next, a building and the city, public space with private, and most importantly the individual and the space they inhabit, whether that space be interior or exterior. However, these are not the only connections in architecture. Architecture is as old as human history, and each new creation in some way fits into the rich tapestry that is the history of architecture. As John Hancock states, “The past is not just that which we know, it is that which we use, in a variety of ways, in the making of new work.... The typology argument today asserts that despite the diversity of our culture there are still roots of this kind which allow us to speak of the idea of a library, a museum, a city hall or a house.” (Between History and Precedent). John Ruskin also about the importance of typology in architecture in his essay The Nature of Gothic.

“....every building of the Gothic period differs in some important respect from every other; and many include features which, if they occurred in other buildings, would not be considered Gothic at all.....That is to say, pointed arches do not constitute Gothic, nor vaulted roofs, nor flying buttresses, nor grotesque sculptures, but all or some of these things, and many other things with them, when they come together so as to have life.” (The Nature of Gothic, pg. 78)

Both of these men understood the concepts of precedent and typology as the foundation of architecture, the jumping-off point for new takes on an old scheme.



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The Shinkenchiku Residential Design Competition was an opportunity to explore the typology of the residence from a completely different perspective, that being the filter of SuperString Theory as discussed in Brian Greene's *The Elegant Universe*.

At its most simple, SuperString Theory posits that everything in the Universe is essentially the same at a subatomic level. While at first this might seem quite similar to quantum theory, SuperString Theory works at a scale even smaller than quantum theory (20 billion times smaller, to be precise), stating that the subatomic particles of quantum theory are actually vibrating strings that are so small that we are unable to see them with our current technologies and therefore only register them as particles. The vibrations of these strings are very complex and would be impossible within the standard model of the 4 dimensional universe, and so SuperString Theory requires 11 dimensions. While this multidimensional universe is seemed to be the focus of the competition from the brief, after reading *The Elegant Universe* I felt that if the competition was to be one in which entrants examined the residence from the perspective of SuperString Theory, than one would have to begin with the underlying interconnectedness of the universe. The added spatial dimensions as described in Greene's work are incredibly tiny "curled up" that are "like the circular loops of thread making up the pile of a carpet.....exist(ing) at every point in the familiar extended dimensions." These dimensions are so small that they are completely undetectable to an individual using the most advanced scientific equipment, never mind the average individual with their only their own unmagnified senses to guide them. These added dimensions are not the core idea of SuperString Theory, they are merely the facilitators in the theory that allow that universe to be based on submicroscopic vibrating strings. It is on these strings and the idea of complete interconnectedness in the universe that I chose to focus my investigation of the residence on.



With SuperString Theory, the universe becomes a grand symphony of life. In it, a subatomic particle is a note, a molecule a chord and so on. Music is a very complex art, and one way that we have devised to understand and teach it is its' written form: sheet music. In its own way, my residence seeks to become sheet music for the universe, a way in which the user can begin to understand their own connections with their world and its impact upon them as well as theirs upon it. A number of projects influenced my final design both with respect to how the residence should interface with the occupant, and also how the residence should relate to the universe at large. Two projects by d'ECOI architects shaped the residences response mechanisms to both

Luschwitz House.
(10x10)



sheet music



individual and universe, and a project by Finnish architect Matti Suuronen also contributed.

The first dECOi project, the Aegis Hyposurface, was commissioned in a competition sponsored by the Hippodrome Theater in Birmingham, England. At its most basic it is a curtain of steel mesh mounted on computer-controlled pistons, which slide back and forth in response to external “stimuli” such as movement, light, and sound. Mark Goulthorpe, principal architect at d’ECOI says that “The project was designed to show on the outside the events that are happening inside [the theater]”. (Architectural Record). The most recent version of the Hyposurface can move each compressed air powered piston 3 times per second, resulting in impressive responsiveness and fluidity. This project is impressive because it is at very forefront of actively responsive architecture. If properly calibrated the Hyposurface could act as visual representation of things happening in the universe that are affecting the occupant of the residence in ways they would not usually be able to experience with their senses. The surface could also work in the opposite direction, and act much more like its application in the Hippodrome, where it would represent the activities of the occupant. The Hyposurface in Birmingham is not without its limitations, however and it would need to be improved for application in the residence. The Hyposurface at the Hippodrome theater is only one sided, and is limited in the number of stimuli to which it can react. For the competition, a similar surface would be needed, but it would have to be double sided and also be able to react to such things as fluctuations in the gravitational and magnetic fields. The goal of using a Hyposurface in the project is to increase the occupants awareness of their connection to the universe by making them aware of changes in the universe that they would normally be unaware of.

The second project by d’ECOI is Luschwitz House in Chelsea, England. This project is a “highly articulated conservatory on a Kensington townhouse, which has a complex faceted surface” which is “sheathed with retractable triangular blinds that are responsive to the fluctuations of external ambient light.” (10x10, pg.115). The Competition residence also responds to external ambient light, but takes this concept of response to the environment one step further. The house actively monitors it’s immediate universe with a number of sensors, and then responds to the stimuli in different ways. monitoring daylight intensity with photocells, the house can adjust the opacity of the panes of variable opacity glass in order to maintain proper temperature in the space, as well as keeping the light level such that the occupant can work and inhabit the space comfortably. Using sensors built into the actively responsive environmental suit, as well as cameras with facial recognition technology, the house attempts to interpret the occupant’s



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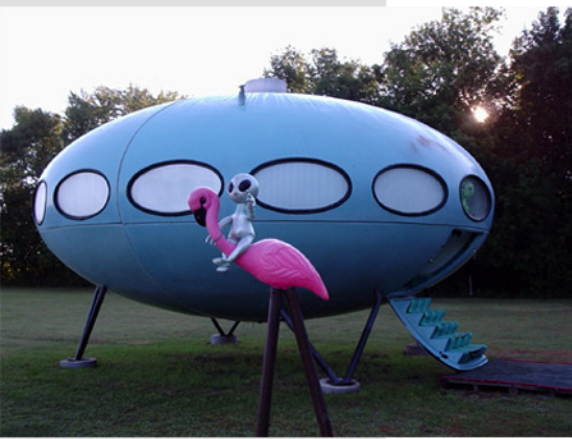
Aegis Hyposurface.
(Architectural
Record).



emotional state, and adjusts the light, heat, and sound penetration levels in order to keep the occupant not only comfortable, but happy.

The house, is in essence, a machine that listens to the universe, and through gestures both subtle and obvious tries to encourage the occupant to do the same.

The third project to influence the competition residence is the futuro-house by Matti Suuronen. The Futuro had its inception as an ordinary architectural commission. In 1965, Dr Jaakko Hiidenkari asked his former schoolmate, Matti Suuronen, to design a ski cabin that would be "quick to heat and easy to construct in rough terrain". The project's working title was 'After-ski cabin'. The design that was developed ended up looking very much like the standard image of a flying saucer, but it was effective in its original purpose as a ski lodge, (it could be heated up, even in chilly weather in less than 30 minutes) and has adapted itself to many uses in 15 countries such as a restaurant, a dance club, a recruiting office for the US Air Force, and most recently an object d'art in the Skop exhibitions by Carsten Holler. What is intriguing about this project (which visually, at least, borders on the ridiculous) is not its plastic construction or interior ergonomics. Rather, its ability to be moved anywhere easily and adapted to any use in almost any climate is truly remarkable. The competition residence is designed to be similarly flexible in that it can be moved anywhere and anyone can inhabit it. It is designed to respond to any situation as best as it can and relate information about the situation to the occupant.



The residence at its most basic is a shelter. For the competition the residence was stripped to this level of simplicity because the concepts that are being dealt with in the competition are incredibly complex. It is not important for this competition specifically where a bathroom or kitchen is. The typology of the residence has established been established, for the purposed of this competition one needs only to leave enough room for all of the necessary components of the residence typology to exist. What is important is trying to progress from this basic typology and investigate how you make a person aware of the complexities of the universe through a building, let alone have them understand it. For that, the established precedents of actively responsive architecture were instrumental in helping me understand how a building could respond to the universe and the individual.

Futuro-House. (www.Futuro.net)



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