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CONCEPT

CONCEPTUAL APPROACH

In 2016 human experience is shared between two realms, the physical and the digital. The phenomenology of space is no longer a solely physical experience. Experience can be mapped on a spectrum of shared digital and physical sensory feedback. There is no longer a harsh line separating digital from physical. Rather, our experiences exist on a spectrum and are constantly balancing the two to find a state of equilibrium that creates a holistic contemporary human experience in the digital age.

Liminal space is a term derived from the Latin word limens which means threshold. In relation to this project the liminal space is the threshold between the digital and physical realms. The project seeks to exist within the threshold space by creating a phenomenological experience that blurs the user’s perception of what is digital and what is physical.
EXPERIENTIAL MAPPING

All experience can be placed somewhere on this spectrum in relation to the four points. The experience of looking at this page for example would be at a point in the top left corner of the graph. It is a primarily physical experience and the interface through which the stimuli is received is a 2-Dimensional planar surface.
THESIS STATEMENT

THESIS // CORE IDEA

Our world is evolving, new technologies have shifted the way in which we as humans experience spaces. This project seeks to explore the liminal space between the digital and physical realms of space through architectural gestures. It exists within the threshold space, blurring the boundaries between what is considered a digitally engaged space and a physical space. Seeking to create spatial experiences that are user-centric and fully responsive to each user. The user is the key influencer of the space, by entering the space they choose to explore this boundary condition between digital and physical through an architectural experience.
"Create an interactive environment not just an architectonic sculpture."

MA YANSONG
SITE CONTEXT

The project is located at 462 Front Street West. Just west of the major intersection of Front Street and Spadina Avenue. This site was chosen for the existing building on the site, currently used as a mechanic shop it is bare bones exposed structure in the majority of the space. This provided a good base from which the project could be developed. Another key influencer in choosing this site over other areas was the density of tech start ups in the area, as these users would likely be the most receptive to this space.

The close proximity to Spadina Avenue also makes the space easily accessible by public transit. This allows the space to be more easily accessed by a greater number of users.
PROGRAMMING THE SPACE

The programming of the space is divided into three core components. These key programmatic areas are for learning, working and exhibiting. In this space they have a symbiotic relationship which allows them to blur their traditional definitions. The programming is related to their physical space but accounts for their digital footprints as well.

The Origin Point is the first area in this project where all three programmatic components share a common space; it is the point of convergence where each programmatic role is neutralized. The space is designed to be communal and fluid to maximize user interaction.
When users first enter the building they enter into the highlighted space above. It is a double height atrium space where all three core programmatic components connect within the building. If you refer back to the graph in section 01 this space is meant to represent the origin point on that graph. The goal was to create a neutral blend of digital and physical experiences that could cohesively create a strong spatial experience through both planar and volumetric gestures.
The starting point for this thesis project was rooted in exploring the relationship between planar elements and their impact on spatial experiences. The phenomenology of curated planar surfaces on an architectural scale was a key driver in the overall development of the space.

This approach required a shift from thinking of designing spaces as volumetric objects to focusing on the relationship between individual planes within a space. The question became how can architectural planes be digitally engaged to create an interface between the digital and physical realms? What logic tied these two realms spatially and how could it be harnessed architecturally?
PLANAR SKETCH MODEL

To get a better grasp on designing through a planar approach I needed to physically build a small sketch model that allowed me to experiment with creating various spatial configurations quickly in 3D.

This model utilized linear planar elements of various sizes and thicknesses to explore spatial ideas that could be then translated into built forms.
As I was doing research into phenomenology one of the architects that was mentioned over and over again in almost every source I was reading was Ludwig Mies van der Rohe. As a study I created diagrammatic drawings of his plans that were very planar in nature to gain a better understanding of how to compose a space in this way.

This exercise made planning the space for this thesis project much clearer. It allowed me to develop an understanding of spatial planning through a compositional lens.
It quickly became evident that there needed to be some kind of system that could spatially represent the digital as well as the physical. Using a grid system as the underlying logic to connect these two realms worked well because it is fundamental to how space is defined in each of them.

In the digital realm space is defined through two systems: the XYZ coordinate system and the UVW coordinate system. In the physical realm space is mathematically defined in the same way through the Cartesian coordinate system. These spaces are mapped or calculated along three main axis, two horizontal axis and a vertical axis. The XY or UV represent points along a flat horizontal plane. The X-axis goes from left to right and the Y-axis goes from front to back, the UV are the same. The Z and W represent points along a vertical plane. These vertical points denote the depth or height of an object.

These mathematical systems are grid-based systems that give quantifiable properties to spatial elements. The key for this thesis project is that they are used to define both digital and physical space. It is a shared logic that can bridge the two realms.
01 | BASE GRID
02 | OFFSET TO DATUMS
03 | VERTICAL GRID ADDED
04 | MOVING WALLS
05 | SPACE FRAME OFFSET
06 | ARM POSITION
This series of diagrams illustrates the development stages of the grid system in relation to the architectural elements of the space. Every element in the space is designed based on this grid system and is connected to it in some way. Even the moving walls and undulating landscape that distort the grid were initially based on the core grid.
ROLE OF THE USER

USERS ARE THE KEY INFLUENCERS OF THE SPACE

The user is crucial to this project as they inherently hold the ability to exist in a digital and a physical space simultaneously. Architectural gestures were made based on the user experience of the space. The project relies heavily on user interaction to drive spatial experiences both for the individual user and the collective user base.

Real-time parametric relationships are created that allow the user to shape the spaces they are physically in through digital interactions. The physical influence from the users is turned into data that exists digitally and is interpreted through digitally driven mechanisms to produce tangible spatial experiences on an architectural scale. That data is completely intangible it is numbers and code but the output is physically tangible.
As the primary influencer in the space the user has the ability to control the space to meet their needs. The space is equipped with the sensory infrastructure so that it is able to read the actions of its users.

The sensory infrastructure is able to take the physical inputs collected from the user behavior and translate it into data.

This data is processed by the data walls and the server system embedded into the buildings infrastructure. The data is processed and made ready for the mechanisms to execute.

The embedded mechanisms in the space execute the commands based on the previous steps within seconds of the user making the decision. This creates a real-time parametric relationship between the user and the space they inhabit through a digital medium.
FROM INTANGIBLE CODE TO RESPONSIVE SOFT-FORM ARCHITECTURAL SURFACES

The existing site conditions had a long laneway that ran along the west side of the building. It was used frequently by users to cross from Front Street to Wellington Street to the north. I wanted to take the opportunity to engage this space in some way.

This laneway provided the perfect space to create a digitally augmented surface that could be programmed to respond to various inputs to create spatial shifts. As an example these walls could be programmed to respond to user activity in the laneway and project that spatially onto the interior of the building and vice versa with the users in the interior. This digitally augmented response takes a surface that is very much solid and physically dense and transforms it into an ephemeral spatial experience that dissolves the barrier between interior and exterior.
This space frame houses the mechanical arms and all the infrastructure that is required to operate them. It also provides structural support for the building.

These mechanical arms are controlled by motors that are triggered digitally as a response to user input.

The surface of these moving walls is an architectural grade tensile mesh. A key property of this mesh is its elasticity, when there is no force being exerted onto it by the mechanical arms it is able to revert back to a flat planar surface. The lines you see are the structural tattoo they express visually the amount of curvature at a certain point on the surface.
DATA WALLS // SPATIAL MEMORY

DESIGNING SPACE FOR THE INTANGIBLE

There were few precedents to reference for architectural projects that were designed for digital space. How could you design a space for something that had no spatial properties? This question and my exploration of phenomenology lead me to looking at sacred spaces. As an architectural typology sacred spaces design physical spaces for something that is intangible.

Through researching about sacred spaces and how to design sacred spaces a common thread kept appearing. The users’ memory of a space is what gave the space meaning. Architects embraced that they could not make a space scared rather it had to become scared through association by memory. Memory leads to meaning.

In terms of the digital memory is stored, memory is the core of what runs the digital space. Everything about digital space is driven by memory and data. I decided to harness this memory by creating large data walls that would house servers that stored all the data or memory generated in the space. This memory could be accessed by being physically present in the space, this requirement meant that the user would only be able to interact with the memory by inhabiting the space physically.
"Memory is not only a space of experience, the past made present in memory, but also a horizon of expectation, the future made present in that same memory."

MIROSLAV VOLF – Architecture, Memory and the Sacred
FLEXIBLE ORDER

The core workspace is based on a grid system that can be manipulated by the users to fit their unique needs. That grid system is imposed by a series of slots in the ceiling plane that house digitally controllable mesh screens that provide visual and acoustic privacy. These screens are organized so that each quadrant of the grid is given three layers that can be independently controlled. The same grid pattern is reflected onto the floor plane through an embedded metal system. This inlay denotes the boundaries of the space and doubles as a magnetic connection for the screens as they lower down into the space.

The workspaces are completely flexible and can be configured in various setups according to the needs of the users. They are modular in design so that they can be applied as freely as possible to the space. The modularity also allows for the system to be implemented in any other project based on this space.
These diagrams illustrate the core workspace screen system as modular units that can be interchanged in the space. The screens primary function is to provide an environment that is visually and acoustically controllable. They become like cocoons that wrap around the users as they work within the larger open space.
Often in large open-plan spaces the users’ sensory system is bombarded by information. This can overwhelm users and become an issue for many people, productivity may drop making the space ineffective as a workspace.

The reset space offers a sensory deprivation space that allows the user to take a break from the busyness of the workspace. All four planes of this space are designed in the same way as the moving walls are with digitally augmented mechanical armatures that can manipulate a surface. Users engage directly with the surface and the surface will respond to their bodies. If a user lays down on the surface they will be supported by each of the arms under them. As they move and shift the arms will adjust to the contours of the users body. The goal is to make the user feel almost weightless that they are floating within this space.
SOFT FORM MECHANICS

The undulating surface you see in the rest space is a textile finish that is soft to the touch and padded so that the user does not feel the hard metal of the control arms. The space becomes akin to a cloud where the user can take a break and float away into their own thoughts. The reset space provides a contemplation space within a larger open plan work environment.
UNDULATING LANDSCAPE

DISTORTED LANDSCAPES

Addressing the horizontal planes of the space was as important as addressing the verticals. The landscaping is treated very much like the moving walls in that it is a soft-form undulating surface. The grid overlay on this surface shows where the ordered grid is distorted and augmented. As the surface starts to undulate the grid responds by bloating and pinching depending on the curvature of the surface.

This organic softscaping is introduced as a physical element that offsets the rigidity of the physical walls in the project. The landscaping elements also break up the rigidity by introducing to the urban fabric soft forms. These soft undulating hills invite users to interact with them while being subtle.