Architecture 2.0
The Immersive
Option studio

Instructor: Simon Kim
Assistant: Andrew Gardner
Consultant: Mark Yim, ModLab
The Immersive is about positioning research and development as the central motivator in design production.

We understand that the dynamic condition of experience is already present in our environment whether we decide to engage it in design or not, so what happens when this dynamic condition is attached to the object?

The studio will explore what are the architectural implications of responsiveness as the potential relationships between space and occupants and among parts of a system.
What if these theories are really true, and we were magically shrunk and put into someone’s brain while he was thinking. We would see all the pumps, pistons, gears and levers working away, and we would be able to describe their workings completely, in mechanical terms, thereby completely describing the thought processes of the brain. But that description would nowhere contain any mention of thought! It would contain nothing but descriptions of pumps, pistons, levers!

Wilhelm Leibniz
Duration is opposed to becoming precisely because it is a multiplicity, a type of multiplicity that is not reducible to an overly broad combination in which the opposites, the One and the Multiple in general, only coincide on condition that they are grasped at the extreme point of their generalization, empty of all “measure” and of all real substance. This multiplicity that is duration is not at all the same thing as the multiple, any more than its simplicity is the same as the One. **Bergsonism**, Gilles Deleuze

The truth is we change without ceasing...there is no essential difference between passing from one state to another and persisting in the same state. If the state which "remains the same" is more varied than we think, then on the other hand the passing of one state to another resembles—more than we imagine—a single state being prolonged: the transition is continuous. Just because we close our eyes to the unceasing variation of every physical state, we are obliged when the change has become so formidable as to force itself on our attention, to speak as if a new state were placed alongside the previous one. Of this new state we assume that it remains unvarying in its turn and so on endlessly. Henri Bergson

*graph with isomorphic substructures*
Iannis Xenakis
What if these theories are really true, and we were magically shrunk and put into someone’s brain while he was thinking. We would see all the pumps, pistons, gears and levers working away, and we would be able to describe their workings completely, in mechanical terms, thereby completely describing the thought processes of the brain. But that description would nowhere contain any mention of thought! It would contain nothing but descriptions of pumps, pistons, levers!

Gottfried Wilhelm Leibniz
Cedric Price
Fun Palace, 1961

Client: Joan Littlewood, Theatre Workshop Director
Cybernetics: Gordon Pask

Its form and structure, resembling a large shipyard in which enclosures such as theatres, cinemas, restaurants, workshops, rally areas, can be assembled, moved, re-arranged and scrapped continuously.
“Choose what you want to do – or watch someone else doing it. Learn how to handle tools, paint, babies, machinery, or just listen to your favourite tune. Dance, talk or be lifted up to where you can see how other people make things work. Sit out over space with a drink and tune in to what’s happening elsewhere in the city. Try starting a riot or beginning a painting – or just lie back and stare at the sky.”
9 evenings: theatre and engineering

OCTOBER 13-14-15-16 18-19-21-22-23 8:30 P.M.
25th STREET ARMORY NYC
PHONE: 689-3315
Experiments in Art and Technology (E.A.T)  
Pepsi Pavilion, Osaka World Fair, 1970

Organizers: Robert Whitman, Billy Klüver  
Sound Environment: John Tudor  
Floats (moving agents): Robert Breer  
Light Frame: Frosty Myers  
Geodesic Dome and Fog: Fujiko Nakaya  
Architect: John Pearce  
Mirror Dome: Robert Whitman
Mounting polyvinyl chloride panels, summer, 1969.

Full-scale model of the mirror installed at Marine Corps Air Station, Santa Ana, California, September 1969. Photo: David McDermott

After initial tear.
Photo: David McDermott
Le Corbusier
Philips Pavilion, Brussels World Fair, 1958
“Poème électronique”

Sound Environment: Edgard Varèse
Designer: Iannis Xenakis
Film: Philippe Agostini
Graphic Design: Jean Petit
Structural Engineer: Hoyte Duyster
Les quatre mères
Les quatre mères du Japon
Les quatre mères du Japon
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The revolution was cybernetics, a transdisciplinary field of research and theory that, in the 60s, 70s, and 80s, changed the way we think about both knowledge and information, and how they are communicated between individuals and social groups. It enabled the advent of “the Information Age,” and paved the way for the use of the computer in every aspect of daily life, including the Internet.

While the direct impact of cybernetics on architecture has so far been limited to concepts of “virtual reality,” “intelligent buildings,” and “simulacra,” its indirect impact has been enormous in the use of the computer as a tool of architectural design, representation, communication, and education.

During the period of cybernetics’ development, the Architectural Association in London was at the center of the effort to apply its ideas and methods to architecture, primarily in the efforts of Peter Cook, the founder of Archigram. Gordon Pask was very much involved in discussions at the AA, along with Cook, Dennis Crompton, Michael Webb, and Cedric Price, (all under the direction of Alvin Boyarsky), about how architecture could become one of the “trans”—“across”—disciplines embraced by cybernetics.

The photo of Pask above is from the cover of one of many magazines published at the AA during this period of intense intellectual and artistic ferment.

I met Gordon Pask on several occasions, most memorably when I was giving a lecture at the AA on Einstein’s ideas of space and time, when he abruptly came to the lectern and finished my lecture—with corrections, of course!

LW
The Colloquy of Mobiles

The English cyberneticist Gordon Pask conceived the «Colloquy of Mobiles» for the 1968 exhibition «Cybernetic Serendipity» held at the ICA in London. It was a reactive, educable, computer-based system composed of five mobiles. By way of light and sound, the rotating elements suspended from the ceiling communicated with each other, independent of external influences. Using flashlights and mirrors, the people at the exhibition could nevertheless take part in the conversation between the machines. With this installation, Pask brought to a conclusion his idea for an «aesthetic potential environment».

To give significance to the communication between the machines, Park designed the «Colloquy of Mobiles» as a social system. At the same time, the form of communication that he conceived referred unmistakably to a sexual analogy: hung from the ceiling were two «males» and three «females». After a phase of inactivity, the females (made of fiberglass) began to glow more intensely and the three males emitted a ray of light. When the ray of light struck the mirror inside the female mobile’s structure, by way of rotating the mirror, she tried deflecting the ray back at the free-hanging light sensors above and below the male’s aluminum body. The goal of communicating was to achieve this moment of satisfaction, and the mobiles learned to optimize their behavior to the point where this state could be reached with the least possible use of energy. With the help of flashlights and mirrors, the exhibition visitors could assume the roles of the mobiles and influence the learning process.
Cybernetic Serendipity

Serendipity

An exhibition

Institute of Contemporary Arts

August 3 – October 20

Other manifestations

Happy chance discoveries of means of control and communication

Both human and electronic

An exhibition

The faculty of making
Cybernetics - derives from the Greek «kybernetes» meaning «steersman»; our word «governor» comes from the Latin version of the same word. The term cybernetics was first used by Norbert Wiener around 1948. In 1948 his book «Cybernetics» was subtitled «communication and control in animal and machine.» The term today refers to systems of communication and control in complex electronic devices like computers, which have very definite similarities with the processes of communication and control in the human nervous system. A cybernetic device responds to stimulus from outside and in turn affects external environment, like a thermostat which responds to the coldness of a room by switching on the heating and thereby altering the temperature. This process is called feedback. Exhibits in the show are either produced with a cybernetic device (computer) or are cybernetic devices in themselves. They react to something in the environment, either human or machine, and in response produce either sound, light or movement. Serendipity – was coined by Horace Walpole in 1754. There was a legend about three princes of Serendipity (old name for Ceylon) who used to travel throughout the world and whatever was their aim or whatever they looked for, they always found something very much better. Walpole used the term serendipity to describe the faculty of making happy chance discoveries. Through the use of cybernetic devices to make graphics, film and poems, as well as other randomising machines which interact with the spectator, many happy discoveries were made. Hence the title of this show."


"I can’t imagine Artforum ever doing a special issue on electronics or computers in art, but one never knows.”

Philip Leider, editor of Artforum, 1967
This record was made to celebrate and commemorate the Cybernetic Serendipity exhibition held at the ICA, London, 1st August to 20th October 1968. During the preparation of the Cybernetic Serendipity exhibition two things became apparent.

One, that in order to show what was going on in the field computer music, it was necessary to include a considerable amount of material that was not strictly composed with or played by computer. Two, that dealing with an exploratory field, all attempts at a historical perspective or firm evaluation were out of place. The exhibition and this record, therefore, are essentially a reportage of current trends and developments in programmed and stochastic music.

The first landmark in computer composition is Lejaren A. Hiller’s ‘Illiac Suite’, 1957. Many experiments have been carried out before, but these were either exploratory without yielding a tangible music, or were mostly concerned with the technical possibilities of imitating familiar sounds.

Ideas which are relevant to composition with computers were frequently employed in the experimental musical composition of the past thirty years. The work of Joseph Schillinger, for instance, through its systematic analysis and programming, antedates the methods employed by computer composers today. The notion of randomness exemplified in the work of John Cage is also of crucial importance. Randomness (decision avoiding, or more concisely, leaving a decision to chance within an exactly specified range of possibilities) is one of the most important tools of the computer composer.

Computer music falls into two categories: computer composition and computer sound. Specific works may employ one or both of these. ‘Illiac Suite’ is computer composed but performed by a string quartet. Pieces by James Tenney, Gerald Strang and Peter Zinovieff utilise the computer both as a tool to compose with and a sound-making instrument. The experimental pieces produced at Bell Telephone Laboratories make use of existing tunes like ‘A bicycle built for two’ but played and sung by a computer.

As a souvenir of the Cybernetic Serendipity exhibition this record is a selection of work in progress.

ICA01
A4 Wilhelm Fucks – Experiment Quatro-Due. 1963, 5 minutes, Mono.

ICA02
B1 Gerald Strang – Composition 3. 1966, 2½ minutes, Mono.
B3 T.H. O’Beirne – Enneadic Selections. 1968, 4½ minutes, Mono.
B4 Peter Zinovieff – January Tensions. 1968, 10½ minutes, Stereo.
B5 Herbert Brün – Infraudibles. 1967, 8½ minutes, Stereo.

http://ubu.com/sound/cybernetic.html
Rowland Emett’s *The Honeywell-Emett Forget-me-not Computer*

Bruce Lacey and Princess Margaret at Cybernetic Serendipity, ICA London, 1968
1. Introduction

Architecture and The Immersive paradigms

2. References

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The Pending research and development

Agostino Ramelli, Reading Wheel, 1588

Daniel Libeskind, Reading Machine, 1985
Giulio Camillo, Memory Theatre, 1550
1. Introduction

2. References

3. Objectives
1. Introduction

2. References

3. Objectives
# Architecture and The Immersive Paradigms

## 1. Introduction

Charles Babbage, Difference Engine, 1837

## 2. References

## 3. Objectives
1. Introduction

Charles Babbage, Analytical Engine, 1837
1. **Introduction**

Industrial Loom (Jacquard Loom, 1801)

2. **References**

3. **Objectives**

- Architecture and The Immersive Paradigms
- The Future Forward World Expositions
- The Pending Research and Development
From the middle of the eighteenth century, two distinct typologies have informed the production of architecture. The first, developed out of the rationalist philosophy of the Enlightenment, and initially formulated by the Abbe Laugier, proposed that a natural basis for design was to be found in the model of the primitive hut. The second, growing out of the need to confront the question of mass production at the end of the nineteenth century, and most clearly stated by Le Corbusier, proposed that the model of architectural design should be founded in the production process itself. Both typologies were firm in their belief that rational science, and later technological production, embodied the most progressive "forms" of the age, and that the mission of architecture was to conform to, and perhaps even master these forms as the agent of progress.

Anthony Vidler, The Third Typology, 1976
Architecture and The Immersive paradigms

1. Introduction

The Future Forward

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The Pending research and development

3. Objectives
1. Introduction

Architecture and The Immersive paradigms

The Future Forward world expositions

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1. Introduction

Architectural and Immersive Paradigms

The Future Forward

World Expositions

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Research and Development

3. Objectives
A skyline of amazing shapes

Expo occupies two islands in the St. Lawrence, connected by bridges (right). There are 60 national pavilions, for more than any other fair has assembled. Some of the most striking are pictured on these pages.

Architecture and The Immersive paradigms

The Future Forward _world expositions

The Pending research and development

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3. Objectives
1. Introduction

Architecture and The Immersive paradigms

2. References

The Future Forward world expositions

3. Objectives

The Pending research and development
1. Introduction

RESEARCH AND DEVELOPMENT

The familiar programme of live/work will be reconsidered within a cross-product of Fun Palace/Theatre and the Research and Design environment of the 1967 Montreal Expo. R&D is the industry's heroic laboratory outside of academic institutions where invention need not immediately answer to market. Research and Development of The Immersive is similarly not bound only by programme and form but can be linked with other speculations - wearables, nonhuman perspective, new material, interaction, reconfiguration.
Central Issues

We will focus on comprehensive forms of responsiveness – augmentation, kinetics, adaptative programme, interaction, input/output, dynamics, memory, material behaviour

We will produce intelligent machines of inhabitation

Work within a Design Research methodology

Focus on live and work, new types of occupation. New models of design.
Methodology

On Transposition

1: to change in form or nature: TRANSFORM
2: to render into another language, style, or manner of expression: TRANSLATE
3: to transfer from one place or period to another: SHIFT
4: to change the relative place or normal order of: alter the sequence of <transpose letters to change the spelling>
5: to write or perform (a musical composition) in a different key

Transposition has a history in music theory and in mathematics, and is one of the sets of permutations that contains the principles of inversion, sequencing, pairing. In the simplest terms, to transpose is to shift or to move. This is normally through a procedure or function in which a node undergoes a transformation in position, relationship or value.
Octahedron
+ Two Point Constraints; Z-Axis
+ Faces Offset
+ Smooth Poly Mesh

Tetrahedron
+ Two Point Constraints; Y-Axis
+ Faces Offset
+ Beveled Edges
+ Smooth Poly Mesh

Icosahedron
+ No Constraints
+ Deletion of Faces to Create Aperture
+ Smooth Poly Mesh

Tetrahedron
+ Two Point Constraints; Z-Axis
+ Faces Offset
+ Smooth Poly Mesh

Octahedron
+ Two Point Constraints; Y-Axis
+ Faces Offset
+ Beveled Edges
+ Smooth Poly Mesh

Dodecahedron
+ Two Point Constraints; Z-Axis
+ Faces Offset
+ Smooth Poly Mesh

Icosahedron
+ No Constraints
+ Deletion of Faces to Create Aperture
+ Smooth Poly Mesh

Icosahedron
STUDIO FORMAT AND SCHEDULE

The semester will be divided into two components: group material research booklet followed by group projects, always conducted in parallel by physical prototyping and digital simulation.

The studio research trip will visit:
1. Cambridge: MIT Media Lab, Self-Assembly Lab, Harvard GSD and Responsive Environments Lab
2. Exeter Library, Kahn, and TAC and Gropius houses
3. Montreal: CCA to view Cedric Price Fun Palace Archive, McGill FARMM Lab