2025

Introduction to Data in Design

CLASS 16

LECTURE

Design Visualization

DATA IN DESIGN

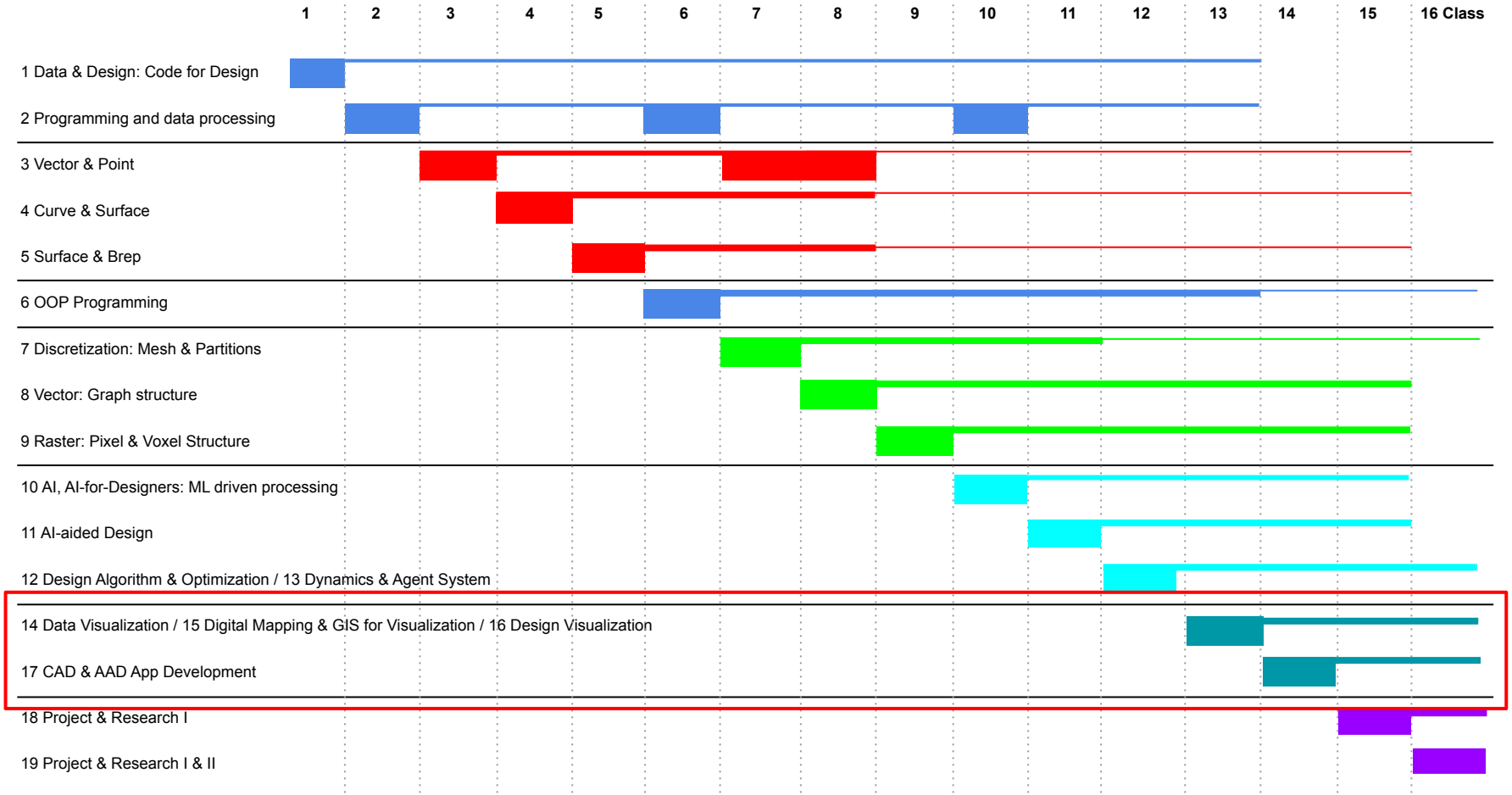
Computational Design

Numerical Descriptions as Design Tools

https://namjulee.github.io/njs-lab-public/teaching

NJ Namju Lee

DATA IN DESIGN 2025



DATA IN DESIGN

DESIGN VISUALIZATION

NJ Namju Lee

Architecture design, Computation, Visualization specialist

Software engineer; ESRI, Ready.net

MDes;Harvard, MArch;UCB, B.S;SNUST, Research Fellow; MIT

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Director and founder of

NJ Design Lab / http://www.nistudio.co.kr

NJSLabs/ https://namjulee.github.io/nis-lab-public

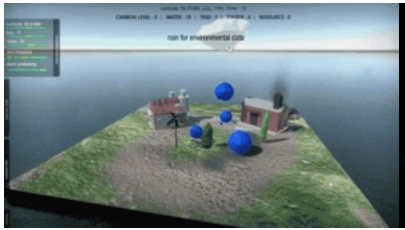

DESIGN VISUALIZATION

DESIGN VISUALIZATION

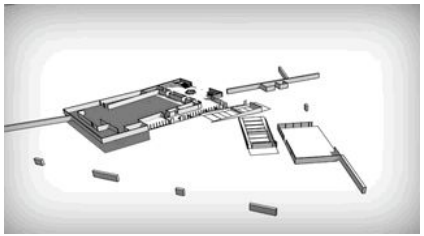
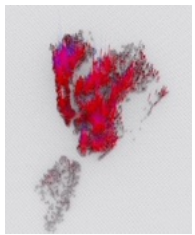
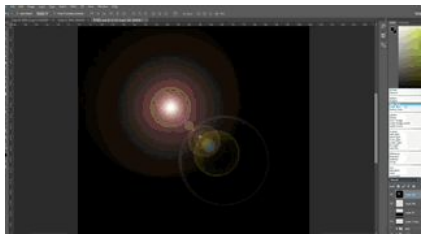
Rendering & Animation

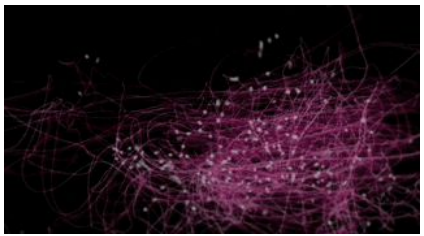
Image & Video

Design Visualization



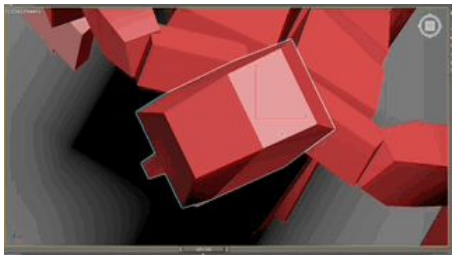
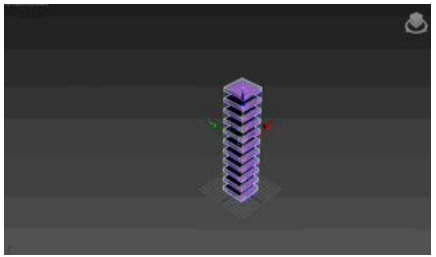


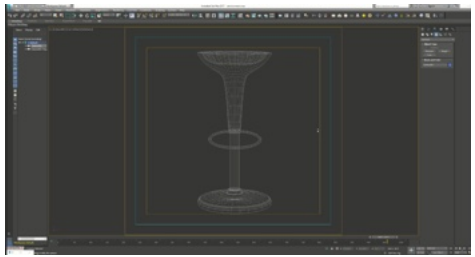
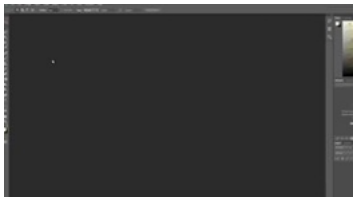
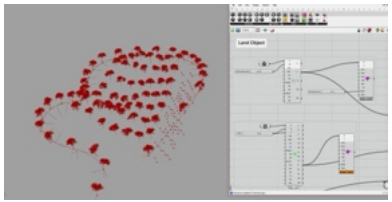
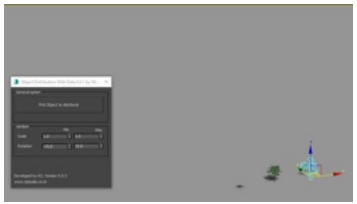
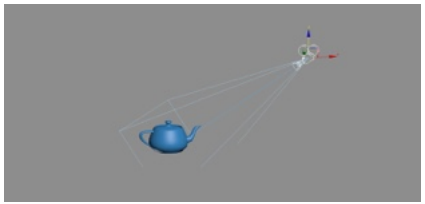
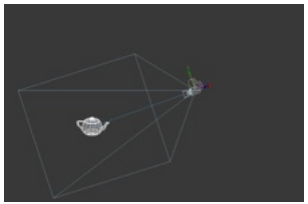





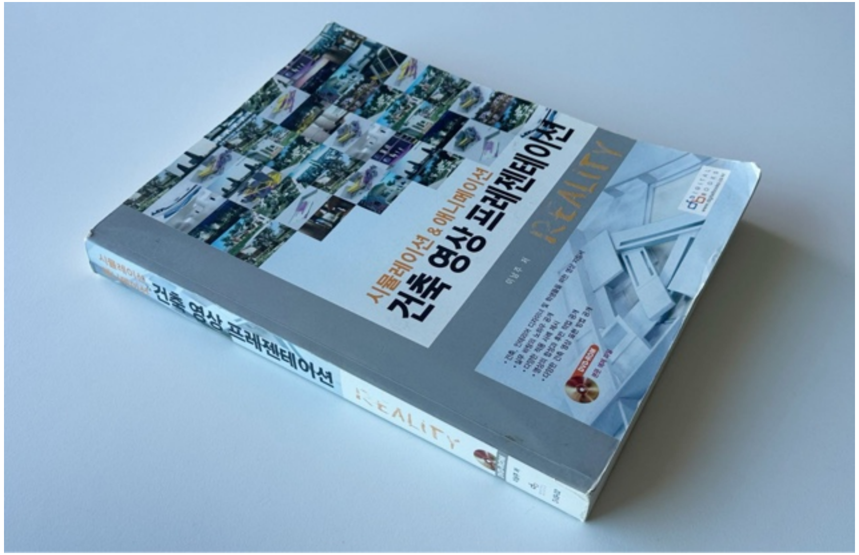



Animation Visualization

Design Visualization



https://namjulee.github.io/njs-lab-public/writing

Animation & Simulation for Architectrual presentation

Author

2008
DigitalBooks
512 Pages

Link: [illegible]

컴퓨테이셔널디자인 10] 건축 시각화 / Architectural Visualization -
https://namjulee.github.io/njs-lab-public/lecture?id=6Z_5oAElfa8

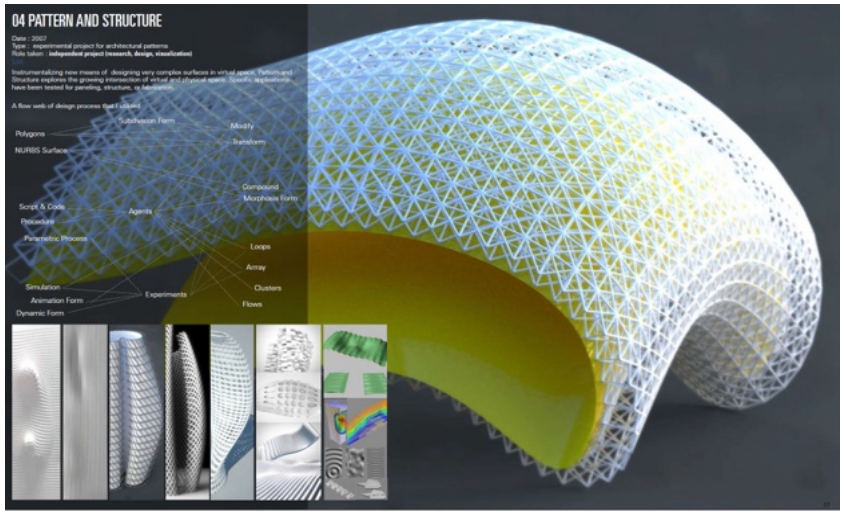
Rendering

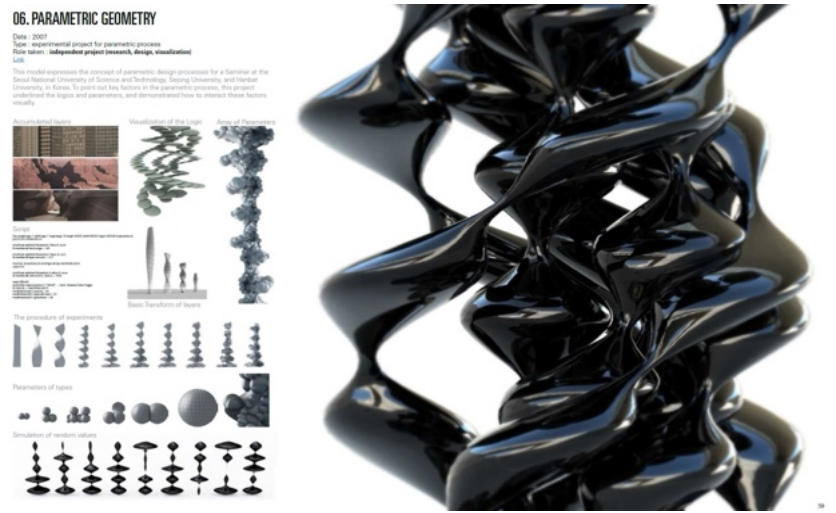






Rendering





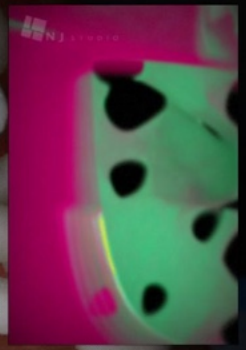
03. A PHENOMENON [UNCERTAIN SURFACE SERIES]

Design Computation Series Work
2009 -Present
Independent work
Rhino3D, Grasshopper, 3ds max

This series of works are experimental simulations regarding a surface or a mass defined by certain phenomena or environments. At first, each project concentrates on a passive surface and mass made by external conditions, rather than an artificial surface or mass. Also, this intangible simulation is finally converted to mass or surface sequences as time goes by.

Phenomena : Viscosity
Project : Uncertain Surface Series
Time Period : 2 weeks

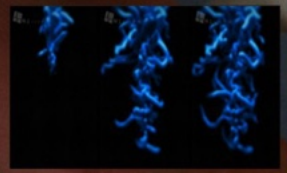
Keyword
Density + Viscosity + Opening + Surface

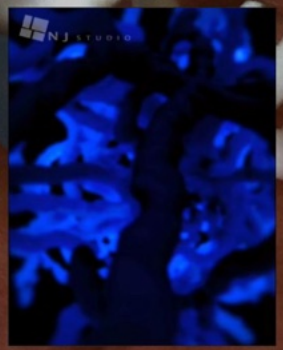


Rapidly prototype of phenomena

Phenomena : Proliferation & Path
Project : Uncertain Surface Series
Time Period : 2 weeks

Keyword
Proliferation + Path + Trajectory + Surface

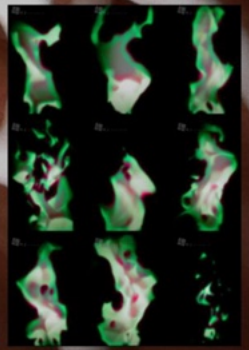


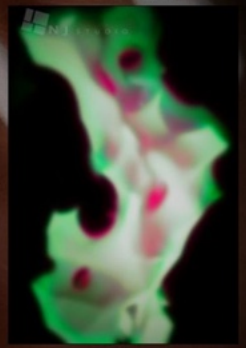


Rapidly prototype of phenomena

Phenomena : Natural Forces(Wind, Gravity, Resistance)
Project : Uncertain Surface Series
Time Period : 2 weeks

Keyword
Rotation + Wind + Gravity + Resistance + Friction





Rapidly prototype of phenomena

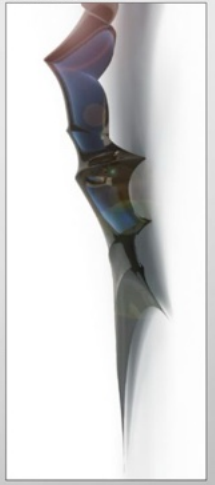
04. TIME-COLLER SURFACE [SERIES WORK]

Design Computation Series Work
2009 -Present
Independent work
Rhino3D, Grasshopper, 3ds max

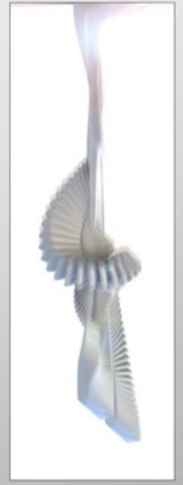
Time-Coller is driven from each word 'time' and 'collage'. Every visible object or intangible concept, such as 'hard', 'soft', 'rotation'; 'condense' and so on, could be varied over time. This series of work focuses on a surface or a space by a trajectory or metamorphosis of an object. Ranging from a movement to an artificial situation through simulation, this experimental field provides me with a playground for different surfaces or spaces.

Motion Surface

Annual-Ring Surface



Falling Surface



Tension Surface

05. PARAMETRIC GEOMETRY [SERIES WORK]

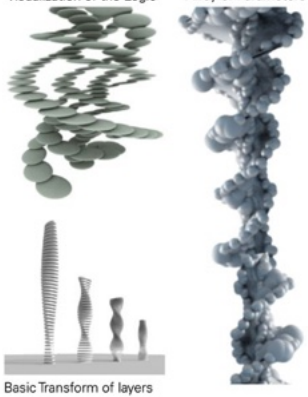
Design Computation Series Work
2007
Independent work
Rhino3dScript, MaxScript

I designed a model expressing the concept of parametric design processes for a Seminar at the Seoul National University of Science and Technology, Sejong University, and Hanbat University, in Korea. To point out key factors in the parametric process, this project underlined the logics and parameters, and demonstrated how to interact these factors visually.

Script

Visualization of the Logic

Array of Parameters



Basic Transform of layers

The procedure of experiments

Parameters of types

Simulation of random values

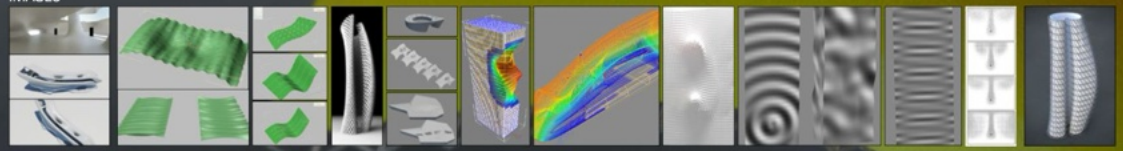
Artificial evolution (Twist Modifier)

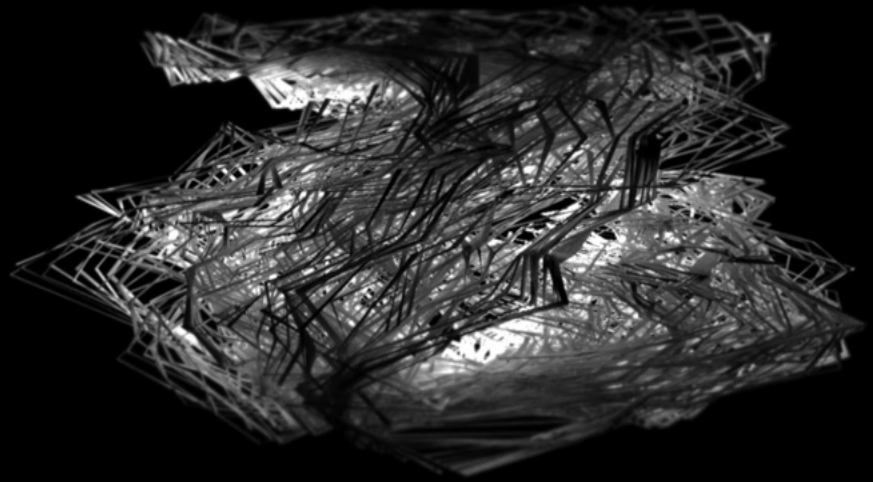
06. PATTERN AND STRUCTURE [DESIGN COMPUTATION SERIES]

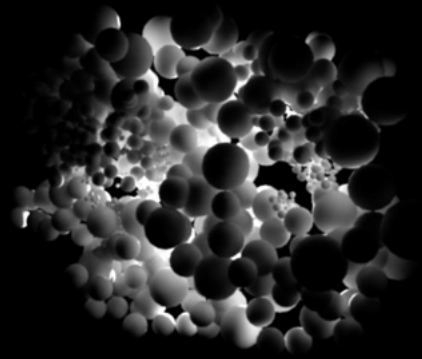
Design Computation Series Work
2007 -Present
Independent work
Auto CAD, Rhino3D, Grasshopper, and 3ds max

As the development of ways to design very complex surfaces in a virtual space, there are an increasing number of ways to realize and connect different worlds, both a virtual space and a real world. This project has been tested with diverse strategies for paneling, or architectural fabrication.

IMAGES







Commercial works demo

Visualization Demo reels playlist:
https://www.youtube.com/playlist?list=PLIyZNoxG7nmn8G9DGZh76WEYkqEghrvok

Design works demo

Design Project Playlist

https://www.youtube.com/playlist?list=PLIyZNoxG7nmkPhK0lJQP1-SM5Vgaa3o50

For Urban, architecture and landscape architecture

(Animation, Rendering, and Post-production process)

INTRODUCTION TO DESIGN

VISUALIZATION

“A picture is worth a thousand words”

Not to see, but to read

Pre-production

Concept/storytelling (raising questions) / schedule / how to read images

Production

Modeling / mapping / lighting / rendering / scene / animation

Post-production

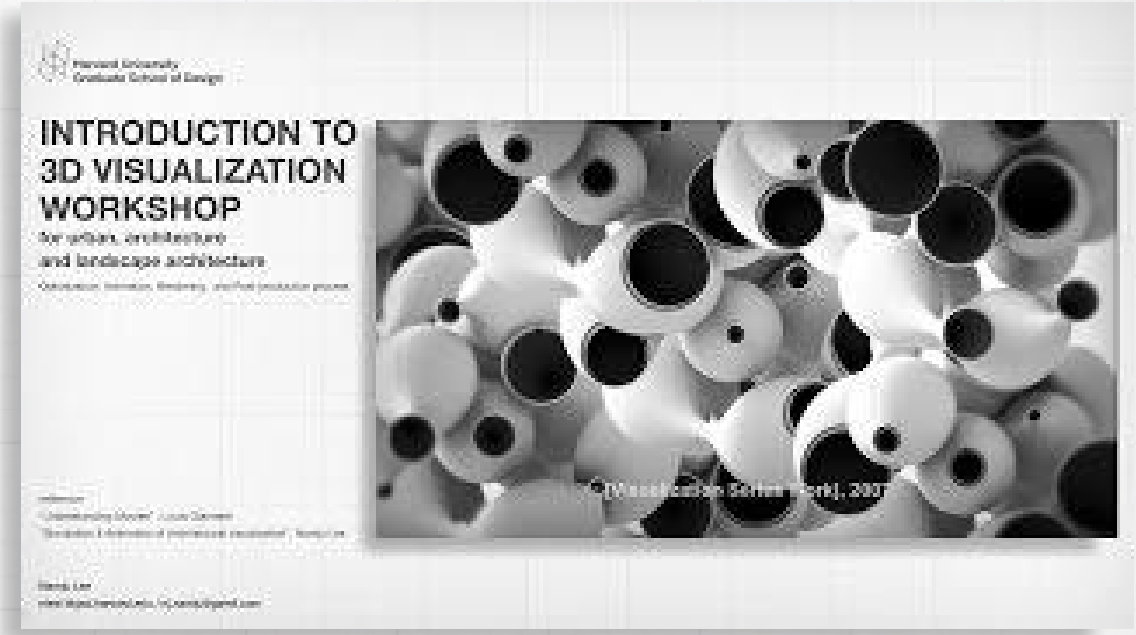
Color correction / edit / effect / motion graphics / sound / compositing

Harvard University
Graduate School of Design

INTRODUCTION TO 3D VISUALIZATION WORKSHOP

for urban, architecture and landscape architecture

Optimization, Animation, Rendering, and Post-production process



reference

"Understanding Movies" , Louis Giannetti

"Simulation & Animation of Architectural visualization", Namju Lee

Namju Lee

nlee1@gsd.harvard.edu / nj.namju@gamil.com

https://namjulee.github.io/3d-visualization-harvard-gsd.github.com/

PART A

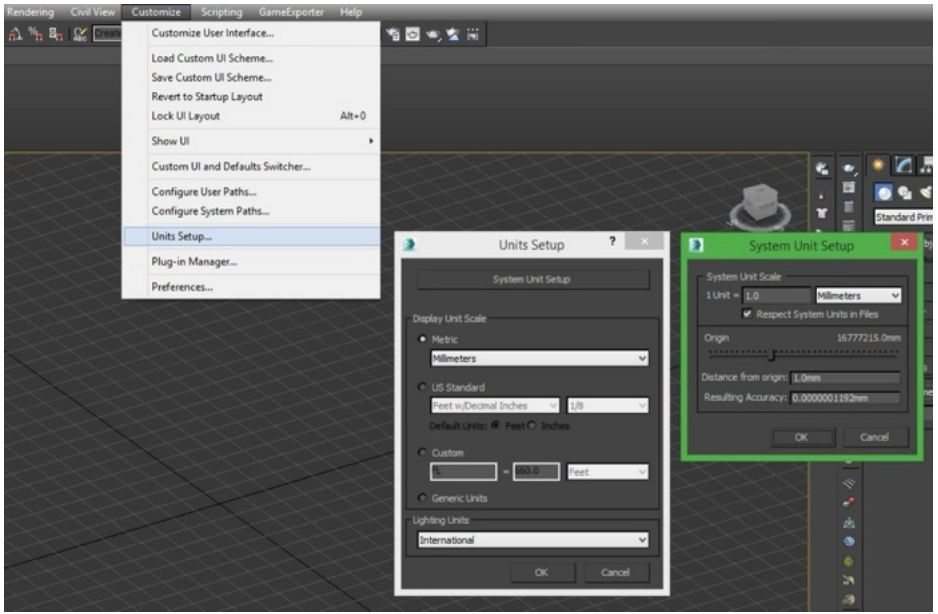
General working process for Urban & architectural visualization

Basic setup and importing models

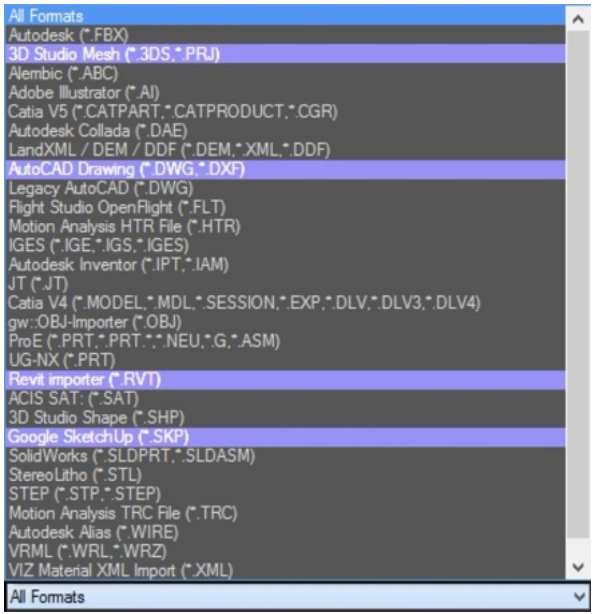
understanding 3ds max

interface, full-down menu, creation panel, viewport
git link

A-1 unit setup: git link

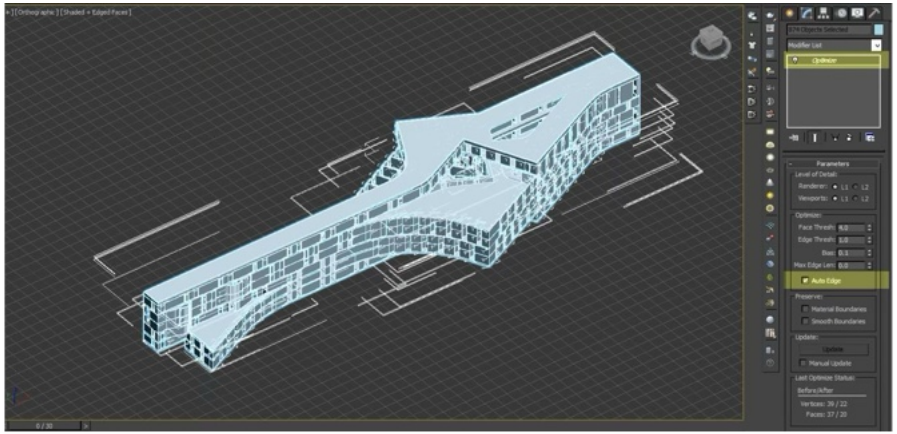


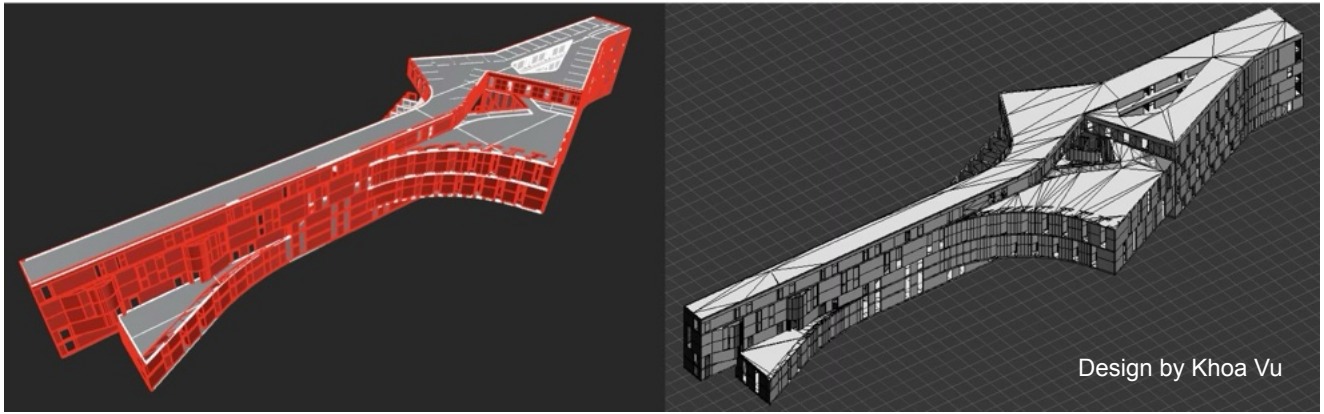
A-2 importing modeling from SktechUp or Rhino3d



Basic setup and importing models

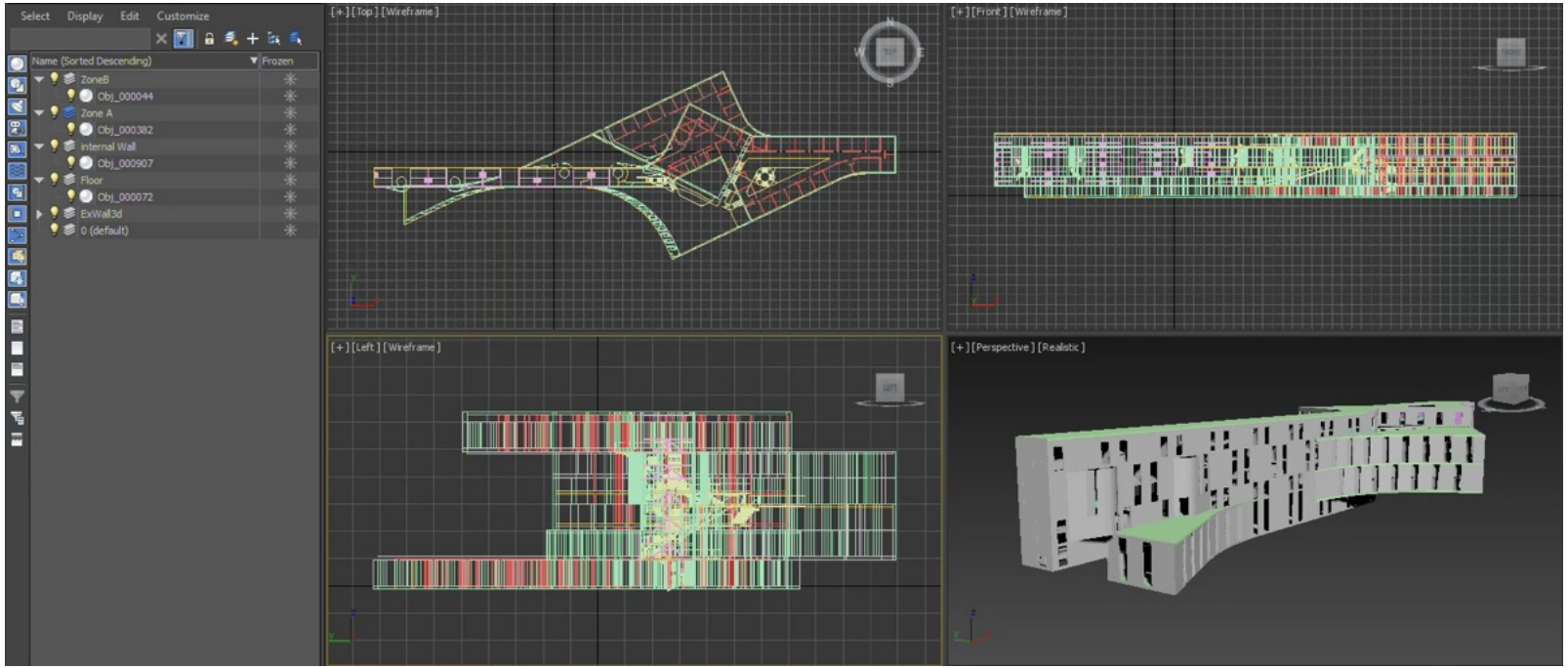
Attach, optimize objects





Basic setup and importing models

Layers and make them group in 3ds max

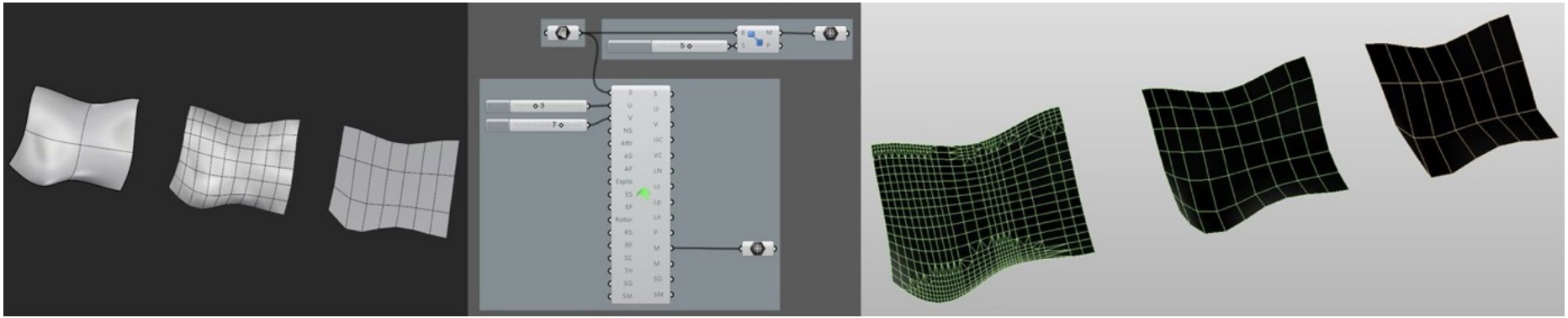


Demo / open A-2-1 importing_Optimization.3dm file in the A-2_ importing_Optimization folder

open 3ds max

Importing & Optimizing

import NURBS surface in 3ds max

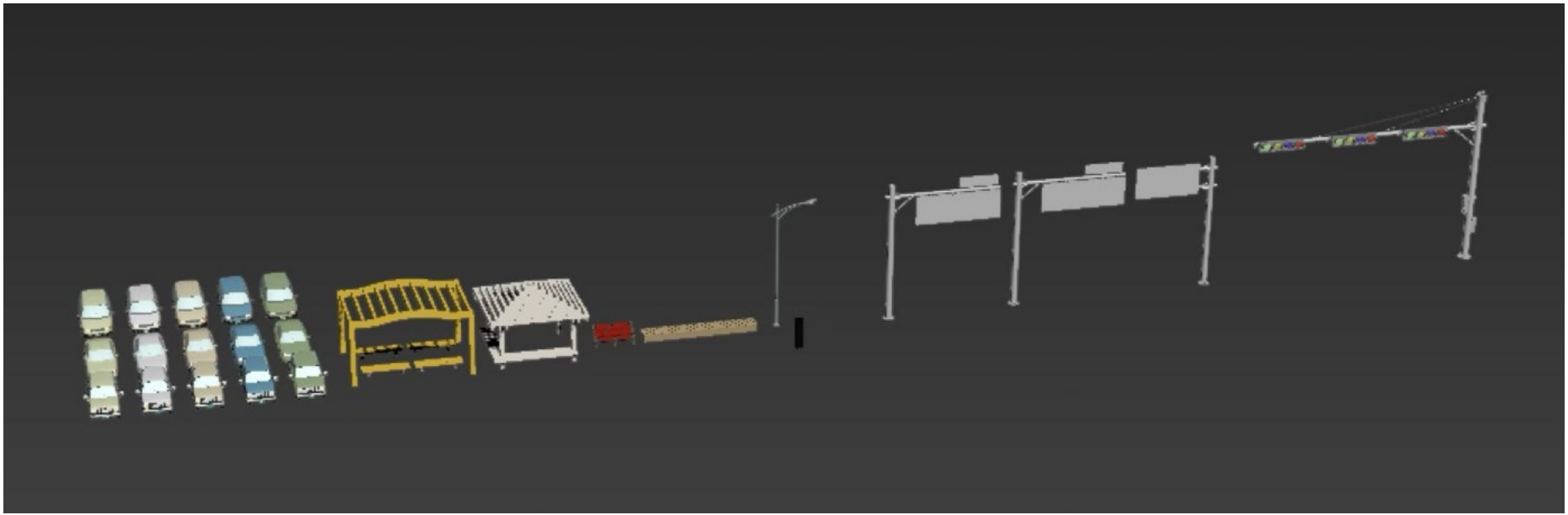


Demo / open A-2-2_ConvertToMesh.gh file in the A-2_ importing_Optimization folder

open 3ds max

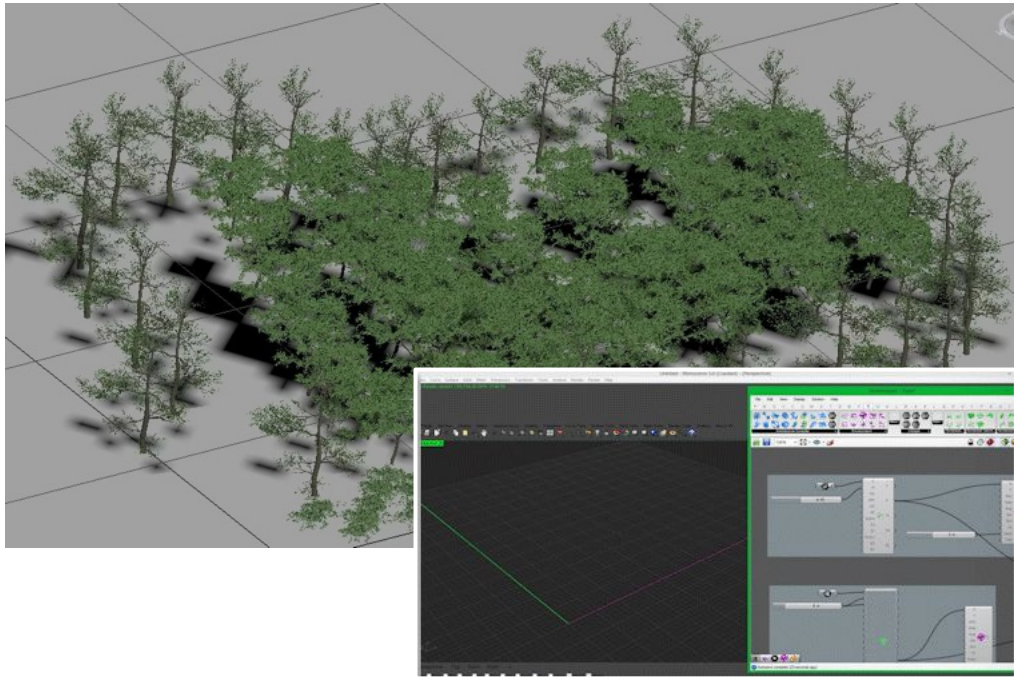
Scene, Object, Merge

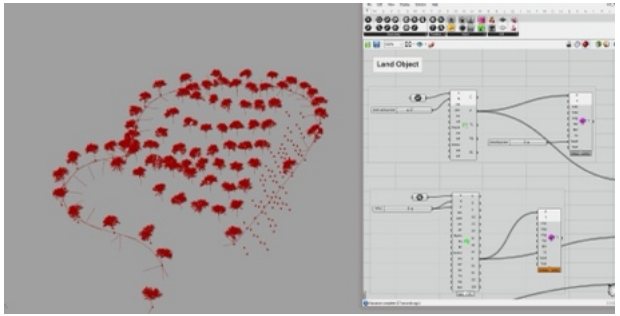
Merge (objects such as car, chair, light, tree, and so on) git link

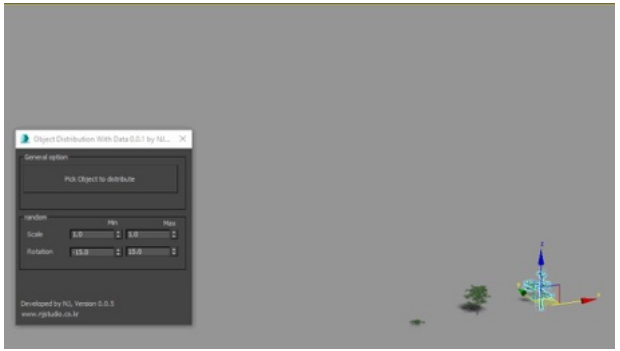


A-5_TreeDistribution

3D tree / proxy tree







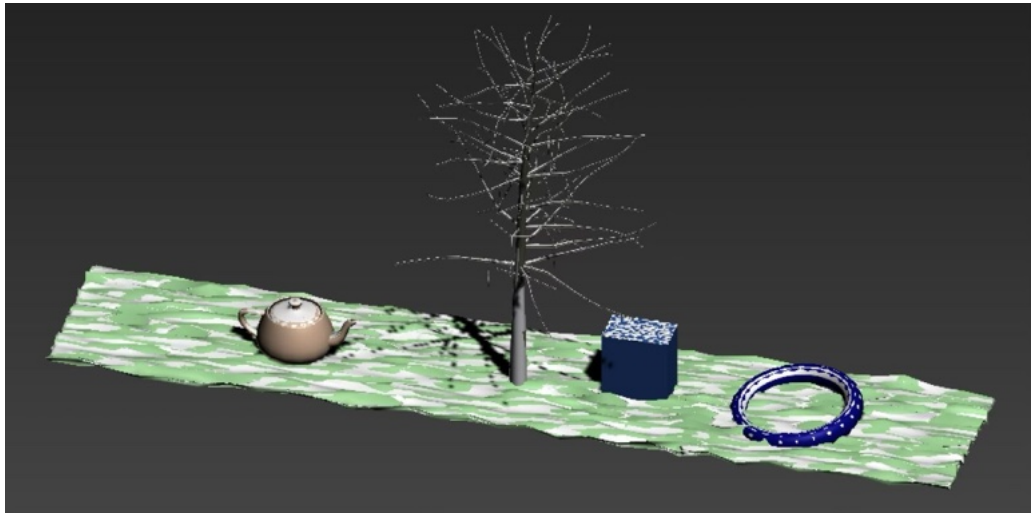
tree distribution(proxy) git link

Demo / open A-5_Trees.gh in the A-5_TreeDistribution folder

open 3ds max

A-6_SnowGenerator script

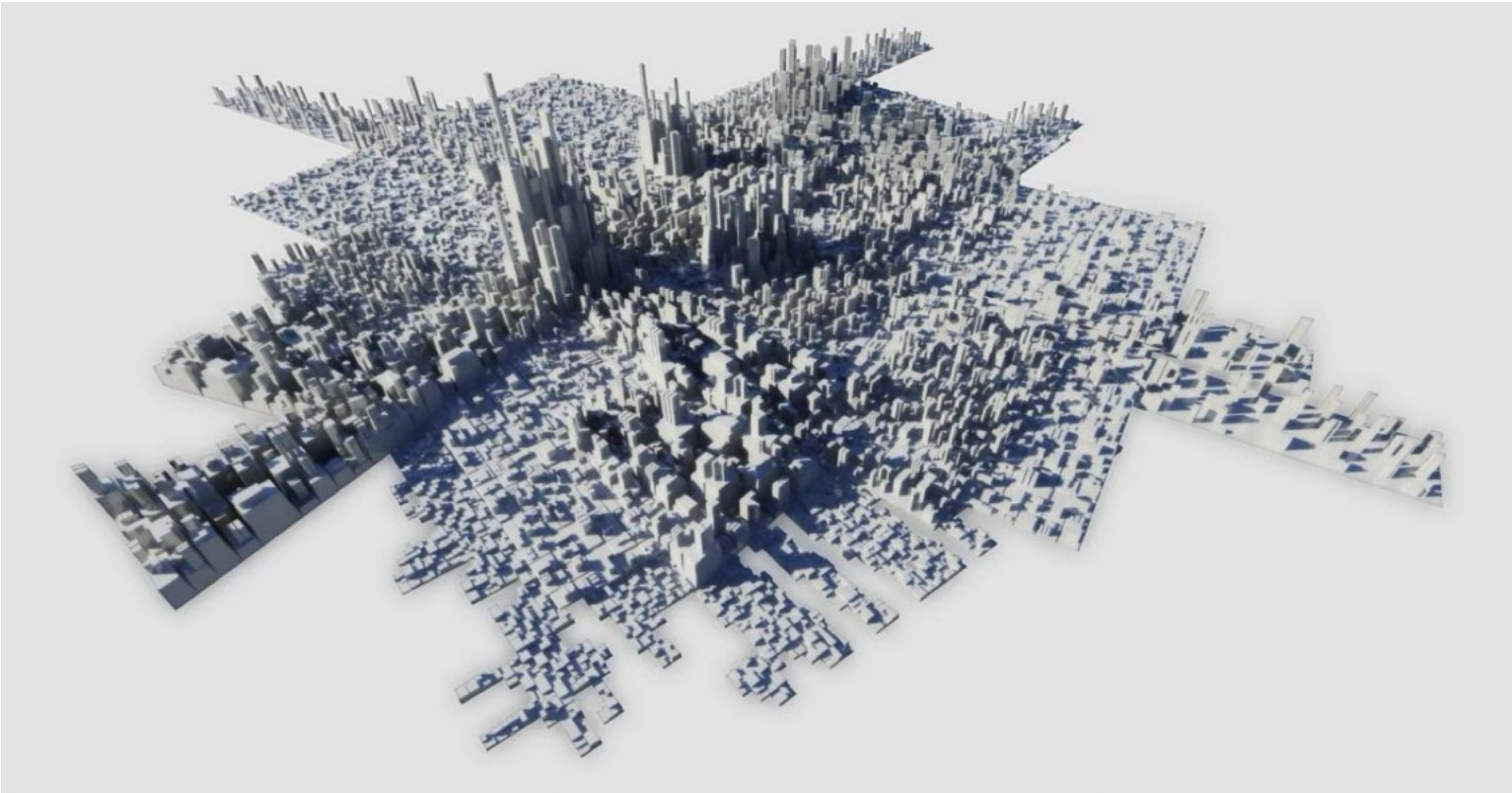
snow generator - git link



Demo / open *A-6_snow generator_start.max* in the A-6_SnowGenerator folder

A-7_Greeble plugin

Greeble - git link



Demo / open A-7_Greeble_done.max file in the A-7_Greeble folder

Camera & Layout (Mise-en-scene)

Frame

Open Frame

www.shutterstock.com

Closed Frame

https://kr.freepik.com/

Aspect Ratio / 비율

16:9 – Widescreen, standard for TVs and YouTube.

4:3 – Old TV format (CRT).

1:1 – Square, used on Instagram.

9:16 – Vertical video, common on smartphones.

Landscape / 가로형

Portrait / 세로형

https://ar.wikipedia.org/wiki/%D0%A0%D0%B5%D1%87%D0%BD%D0%BE_%D0%BA%D0%BE%D1%80%D0%B8%D1%82%D0%BE

Static Composition / 정적 구도

horizontal composition / 수평 구도

https://itourbox.kr/?p=15208

Vertical composition / 수직 구도

https://gilbutbook.tistory.com/810

Circular composition / 원형 구도

https://brunch.co.kr/@gipyung/96

Diagonal composition / 사선 구도

https://brunch.co.kr/@gipyung/96

Triangular composition / 삼각 구도

https://brunch.co.kr/@gipyung/96

Dynamic Composition / 동적 구도

Diagonal composition / 사선 구도

https://www.crowdpic.net/

Arc composition / 호선 구도

www.njsutiod.oc.kr

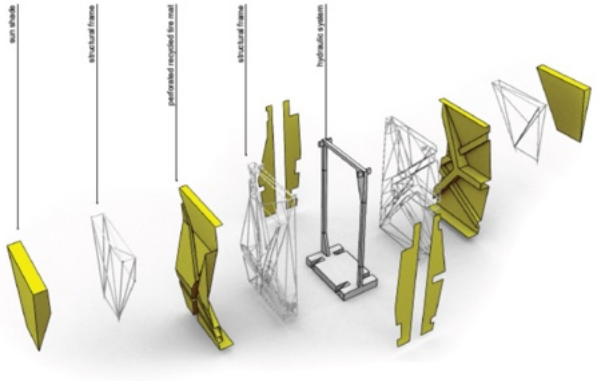
Curved composition / 호선 구도

http://art2me.org/images/hwehwa/punggyeong/punggyeong.htm

Scale / Object

Buildings, site, landscaping, people, vehicles, and other infrastructure

https://m.blog.naver.com/ulsan-port/221347447089



https://namjulee.github.io/njs-lab-public/work?id=2013-flatlot-competition

Foreground, Middle ground, Background

Camera & Layout (Mise-en-scene)

Camera

1 frame

Vertical, Horizontal, Square, Diagonal, Open, and Closed frame

2 composition (background and foreground)

Composition, Scale, Material, Detail and so on

3 camera angle

High angle, Low angle, Bird's eye angle, Eye angle, Oblique angle

3 camera shot

Extreme long shot, Long shot, Full shot, Medium shot
Close up shot, and Extreme close-up shot

Movement

1 perception

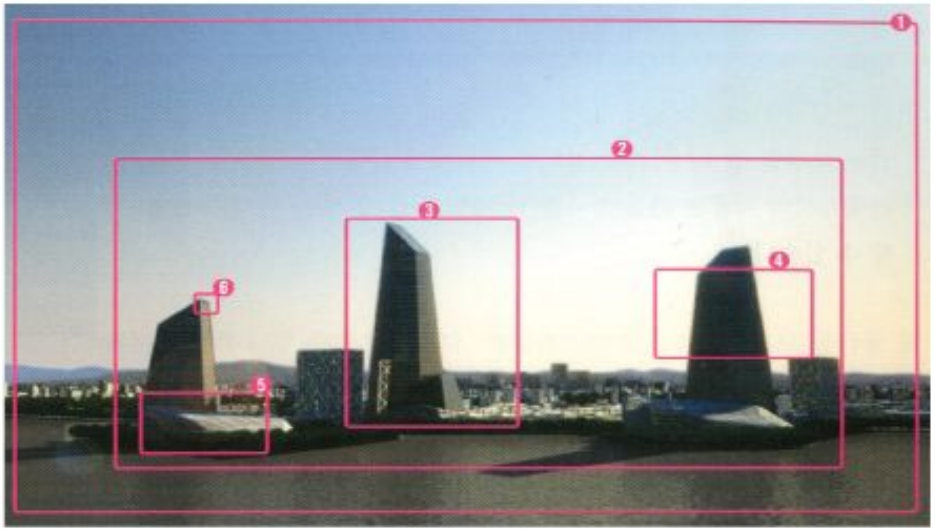
Traditional, Emotional, Rational, Contrast, Absolute or Relative movement

2 camera

Pan, Tilt, Dolly shot, Zoom short, Handheld shots, Crane shots or Aerial shots

3 scenes

Transition between scenes

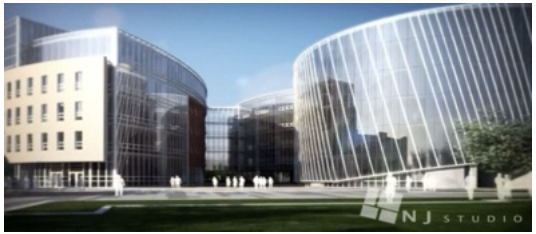


Camera angle

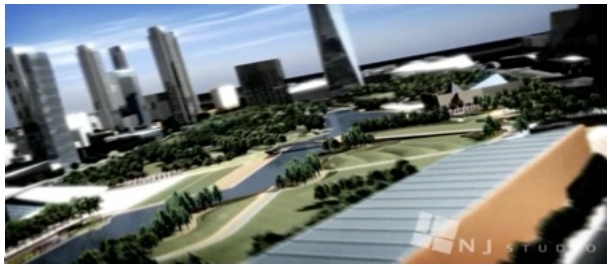
Bird's eye angle

High angle

Eye angle



Oblique angle



Low angle

Visual attention path & Object movement

The Cultural Lens: Vision in Tradition and Custom

The Cultural Lens: Vision in Tradition and Custom

https://v.daum.net/v/NVBVwr6wWT

https://v.daum.net/v/NVBVwr6wWT

https://www.flickr.com/photos

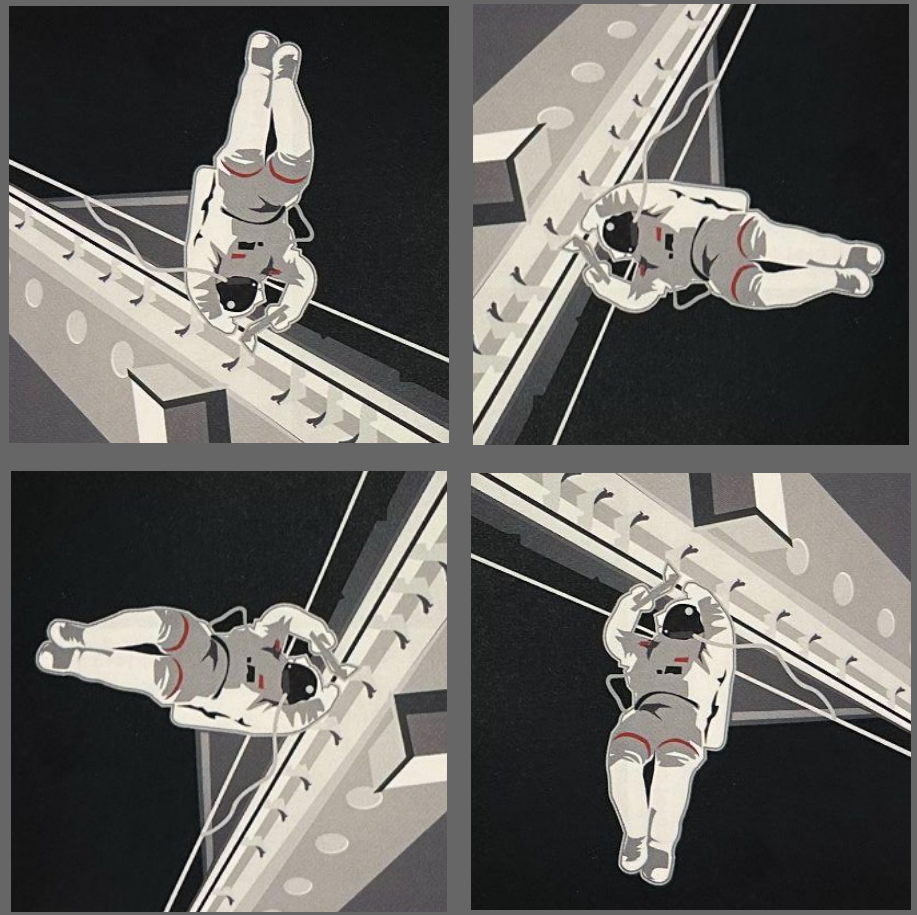
www.njsutiod.oc.kr

https://www.sisain.co.kr/news/articleView.html?idxno=47691

https://www.nemopan.com/photo_creature/996362

NASA

The Cultural Lens: Vision in Tradition and Custom

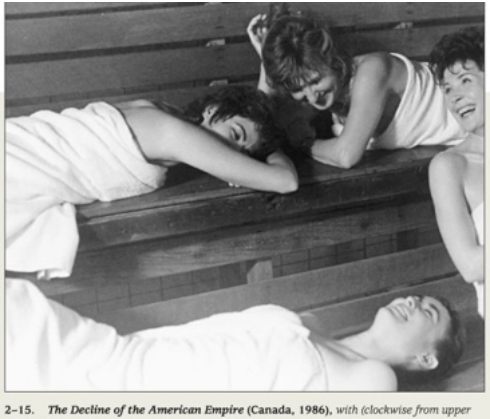


일러스트
김우성

1–12a. *Bonnie and Clyde* (U.S.A., 1967), *with Faye Dunaway and Warren Beatty, directed by Arthur Penn.*
High angles tend to make people look powerless, trapped. The higher the angle, the more it tends to imply fatality. The camera's angle can be inferred by the background of a shot: High angles usually show the ground or floor; low angles the sky or ceiling. Because we tend to associate light with safety, high-key lighting is generally nonthreatening and reassuring. But not always. We have been socially conditioned to believe that danger lurks in darkness, so when a traumatic assault takes place in broad daylight, as in this scene from *Bonnie and Clyde*, the effect is doubly scary because it's so unexpected. *(Warner Bros.)*

1–13a. *Halloween: The Curse of Michael Myers* (U.S.A., 1995), *with George Wilbur, directed by Joe Chappelle.*
Low angles can make characters seem threatening and powerful, for they loom above the camera—and us—like towering giants. We are collapsed in a position of maximum vulnerability—pinned to the ground, dominated. *(Dimension Films)*

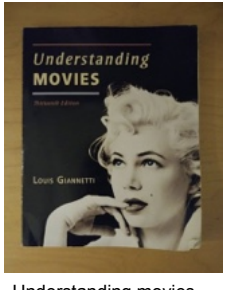
2–2. *Notorious* (U.S.A., 1946), *with Leopoldine Konstantine, Ingrid Bergman, and Claude Rains; directed by Alfred Hitchcock.*
Hitchcock always regarded himself as a formalist, calculating his effects with an extraordinary degree of precision. He believed that an unmanipulated reality is filled with irrelevancies: "I do not follow the geography of a set, I follow the geography of the screen," he said. The space around actors must be orchestrated from shot to shot. "I think only of that white screen that has to be filled up the way you fill up a canvas. That's why I draw rough setups for the cameraman." Here, the mise en scène is a perfect analogue of the heroine's sense of entrapment, without violating the civilized veneer demanded by the dramatic context. The dialogue in such instances can be perfectly neutral, for the psychological tensions are conveyed by the placement of the camera and the way the characters are arranged in space. This shot might be titled Feeling Paranoid. *(RKO)*



2–15. *The Decline of the American Empire* (Canada, 1986), *with (clockwise from upper left) Louise Portal, Dominique Michel, Dorothée Berryman, Geneviève Rioux, directed by Denys Arcand.*
A group of women work out, talk, and laugh in a health club while the men in their lives prepare a gourmet meal in an apartment. The circular design in this shot reinforces the air of camaraderie among the women. The shot's design embodies their shared experiences and interconnectedness: literally, a relaxed circle of friends. *(Cineplex Odeon Films)*

2–17. *Superman* (U.S.A./Britain, 1978), *with Glenn Ford (seated), directed by Richard Donner.*
Because the top half of the frame tends to be intrinsically heavier than the bottom, directors usually keep their horizon well above the middle of the composition. They also place most of the visual weights in the lower portions of the screen. When a filmmaker wishes to emphasize the vulnerability of the characters, however, the horizon is often lowered, and sometimes the heaviest visual elements are placed above the characters. In this witty shot, for example, the parents of little Clark Kent are astonished—and visually imperiled—by the superhuman strength of their adopted son. *(Warner Bros.)*

2–21. *The 400 Blows* (France, 1959), *with Jean-Pierre Léaud, directed by François Truffaut.*
The space between the main characters and the camera is usually kept clear so we can view the characters without impediment. But sometimes filmmakers deliberately obscure our view to make a dramatic or psychological point. The reckless 13-year-old protagonist of *The 400 Blows* tries to act tough most of the time, and that usually means stay cool, and don't let them see you cry. When the dramatic context or the character's nature doesn't permit the film artist to express emotions openly, they can sometimes be conveyed through purely visual means. Here, the youth's anxiety and tenseness are expressed through a variety of formal techniques. His inward agitation is conveyed by the diagonal lines of the fence. His sense of entrapment is suggested by the tight framing (sides, top, bottom), the shallow focus (rear), and the obstruction of the fence itself (foreground). This boy's going nowhere. *(Janus Films)*



Understanding movies

Louis Giannetti

A-9_RenderingTemplate

RENDERING git link

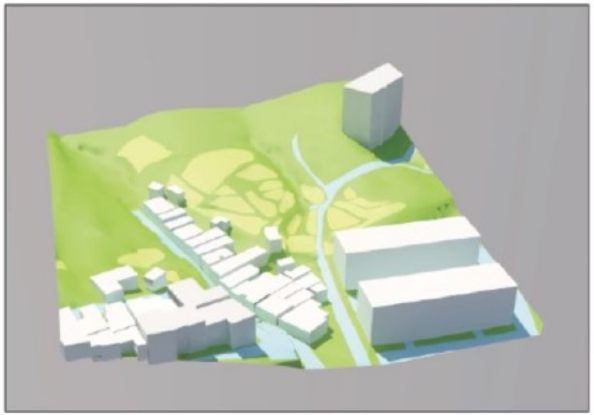
1. Understanding global illumination(GI) system

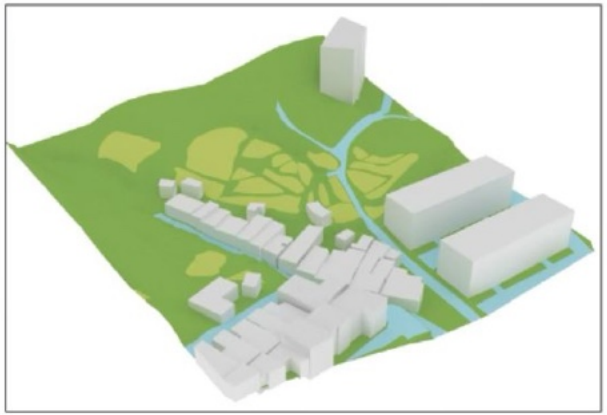
lighting / environment / setting...

2. rendering engine and template

Raytracing
Vray Sun(physically based rendering)
HDRI
Dome
Radiosity
Light Tracer

understanding rendering template(VRay Sun, Dome, and HDRI rendering template)





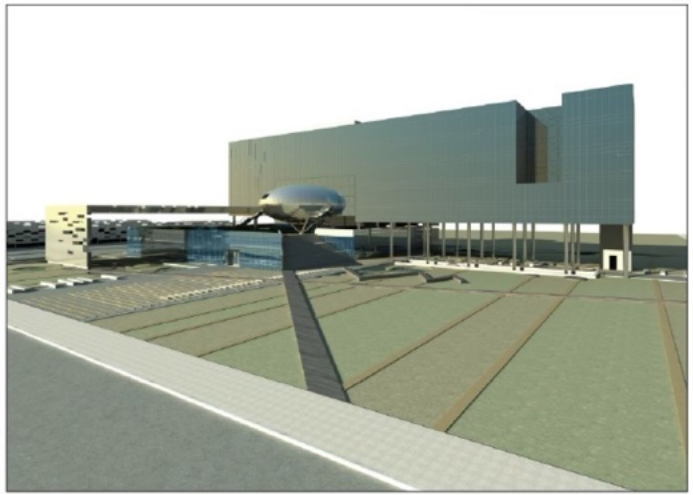
Demo / open Template_Exterior_VraySun.max file in the A-9_Material_RenderingTemplate folder

A-8_Material Template

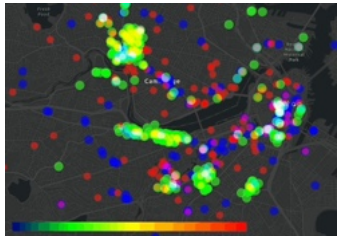
understanding texture and Material and template (VRay)

Demo / open Material_start.max file in the B-4_Material_Rendering folder

A-10_RetourchForStillimage

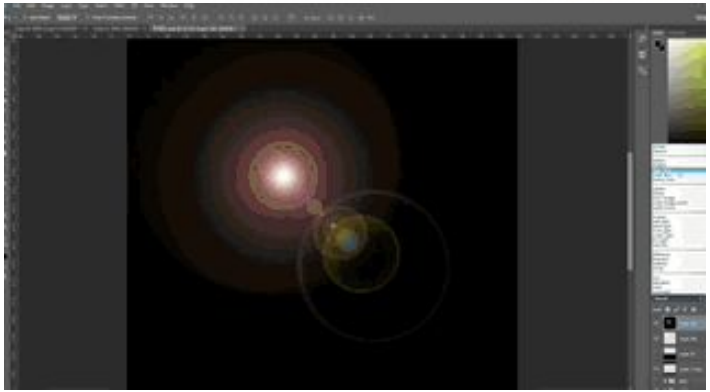


post-production for image git link



https://namjulee.github.io/njs-lab-public/lab/lab-digital-mapping/third-place?ui=0

Demo / open A_10_PepspectiveAfter.psd file in the A-10_RetourchForStillimage folder



PART B

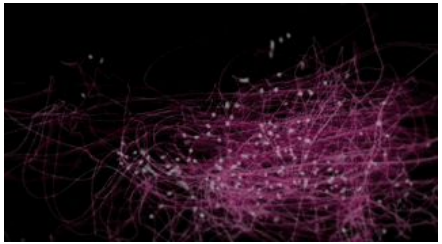
General working process for Animation for architectural visualization

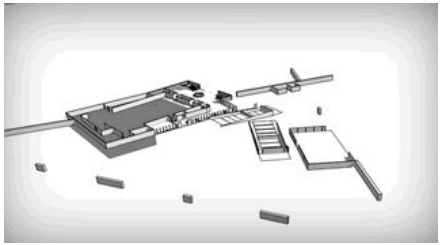
understanding animation in 3ds max

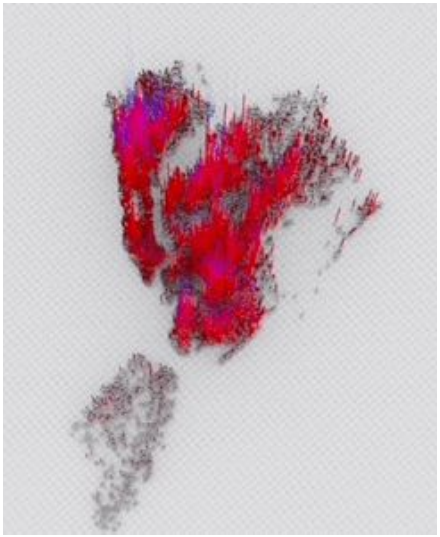
ANIMATION & VISUALIZATION

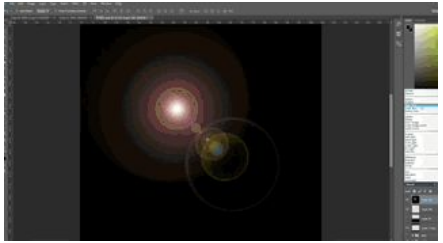
http://www.njstudio.co.kr/main/project/2015_Demo_Vis/2015_Demo_Vis.html

http://www.njstudio.co.kr/maain/project/2013_Ants[Development]/2013_Ants[Development].html







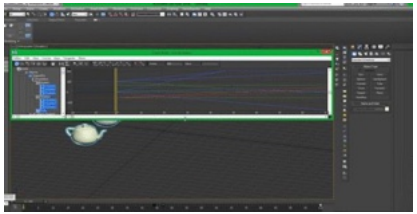


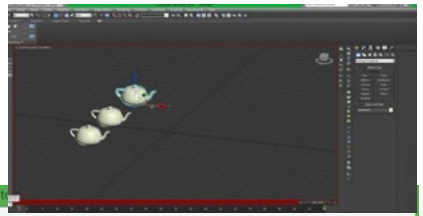
B-2 transform: position, rotation, and scale

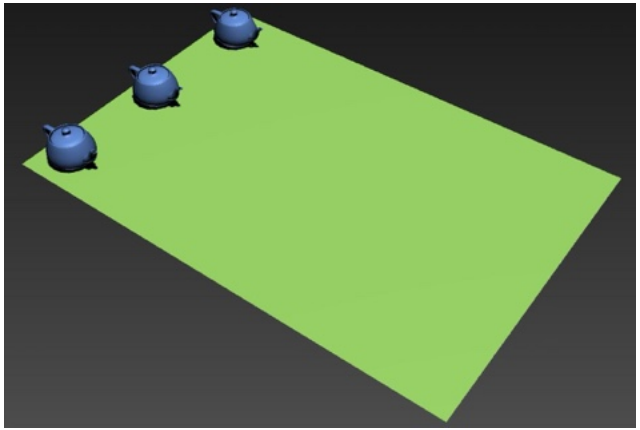
Understanding animation in 3ds max

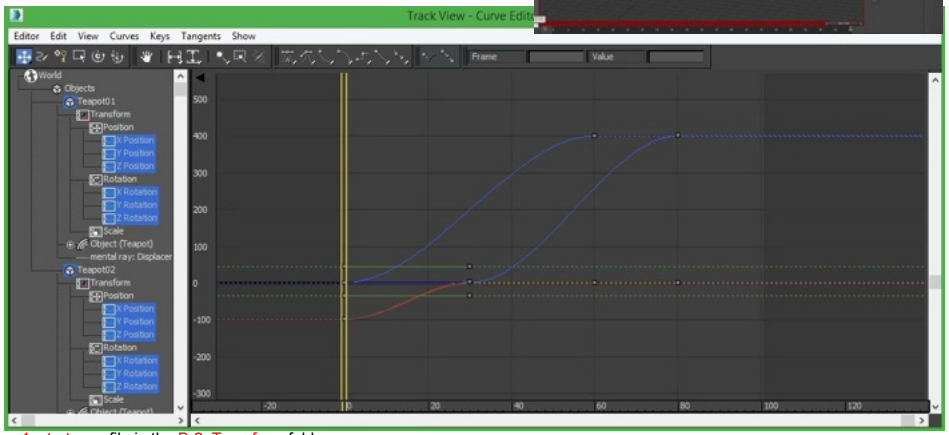
transform: position, rotation, and scale
animation with transform (curve editor / trajectory / track bar / frame rate)
git link

B-2 animation with transform (curve editor / trajectory / track bar / frame rate)



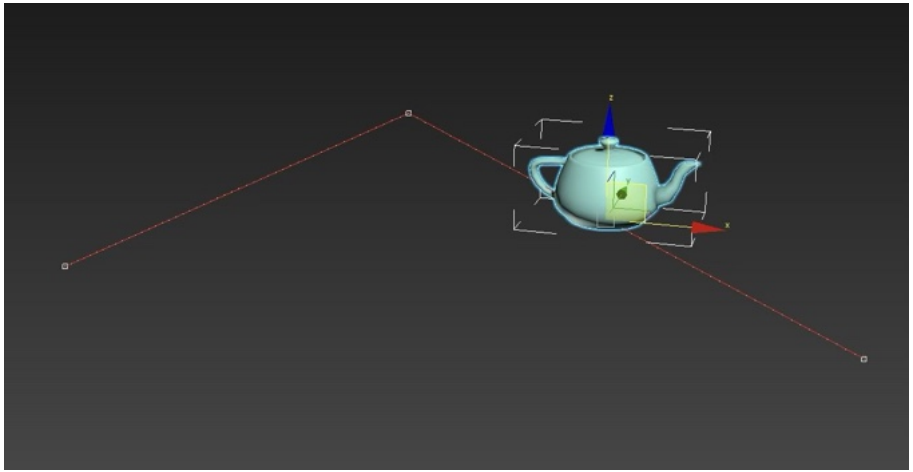


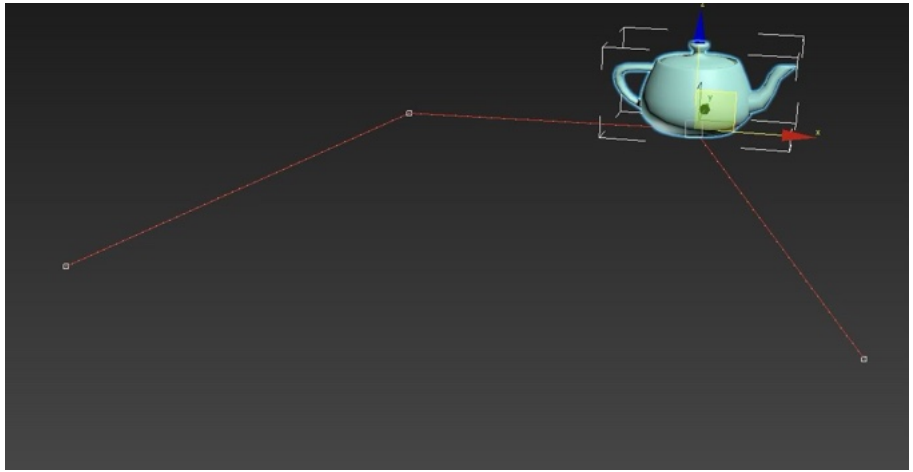




Demo / open B-2-Key_1_start.max file in the B-2_Transform folder

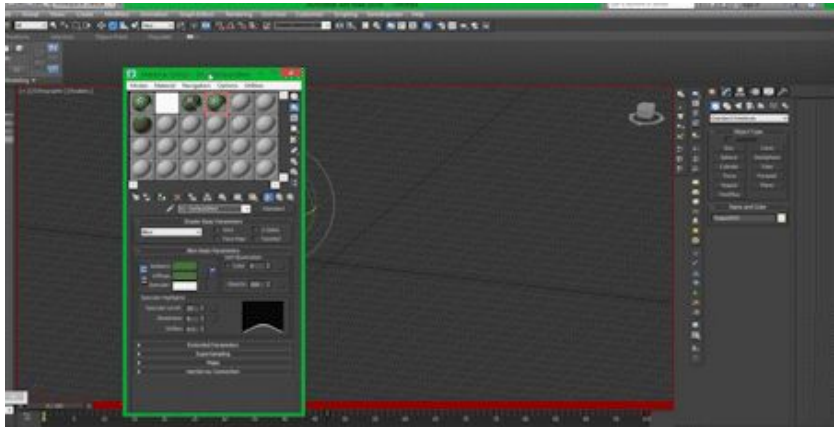
Problem with Auto Key / without Auto Key

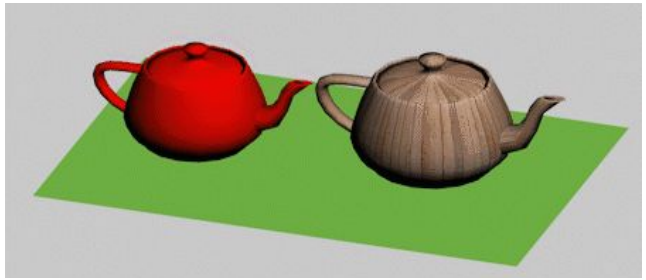




B-3 material, colors UVWMap

B-3 animation with transform (curve editor / trajectory / track bar / frame rate)





animation with materials

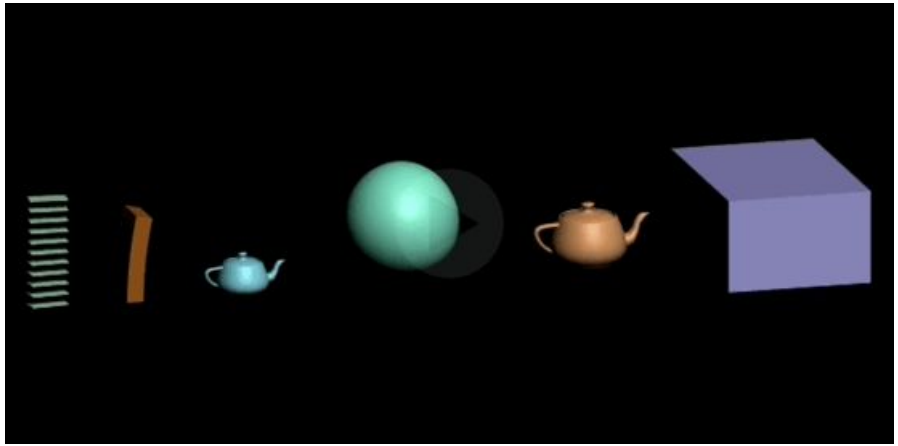
colors, bitmaps ...

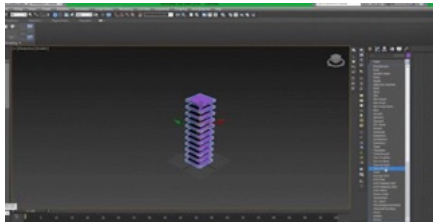
git link

Demo / open C-3-MapAnimation_start.max file in the B-3_Material folder

C-4 animation with modify

Bend / Twist / Boolean operation and so on





animation with modifies

bend / twist / boolean operation ...

git link

Demo / open C-4-ModifyAnimation_start.max in the C-4_Modify folder

Visualizing trajectory

B-5 animation with constraint and link

animation with constraint and link

camera path … git link

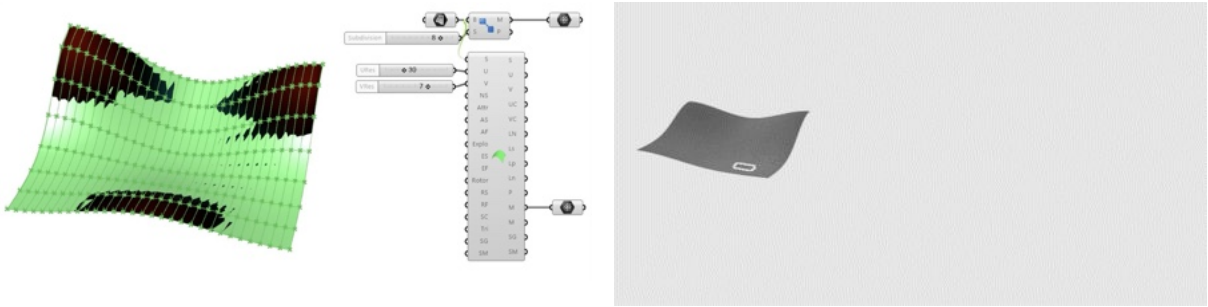
Demo / open B-5-PathNLinkAnimation_start.max in the B-5_Link_Constraint folder

B-6 animation for Building animation

animation for building construction

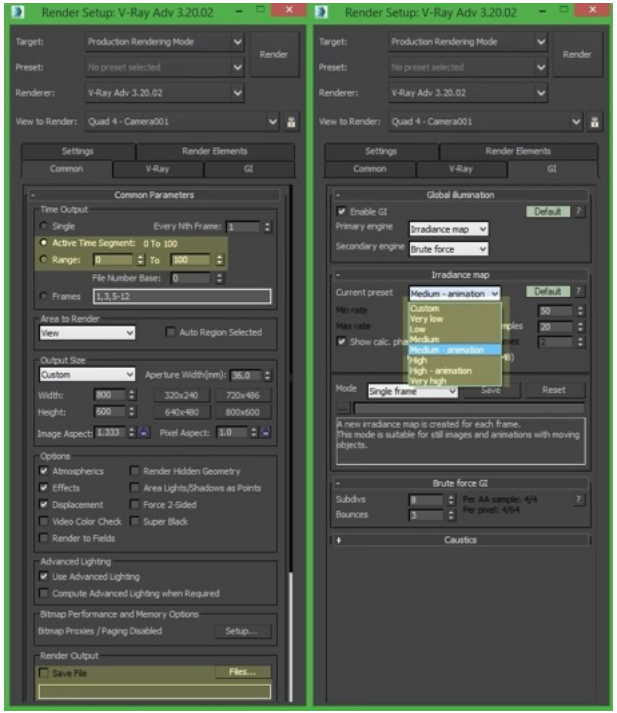
position, scale, rotation, opacity...
git link

B-7 animation for Building animation



Demo / open C-7__ConvertToMesh.gh in the C-7_ANT plugin folder
open 3ds max

B-8 Animation rendering template and sequence rendering



animation rendering (sequences)

range rendering … git link

animation by ANT scripted plugin

[Link] ANT plugin in 3ds max …
git link

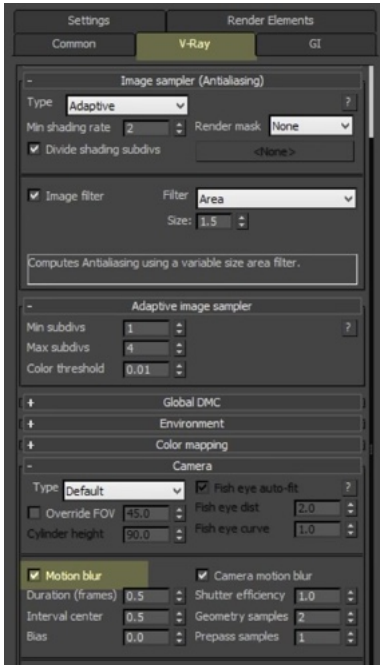
360 video ...
git link

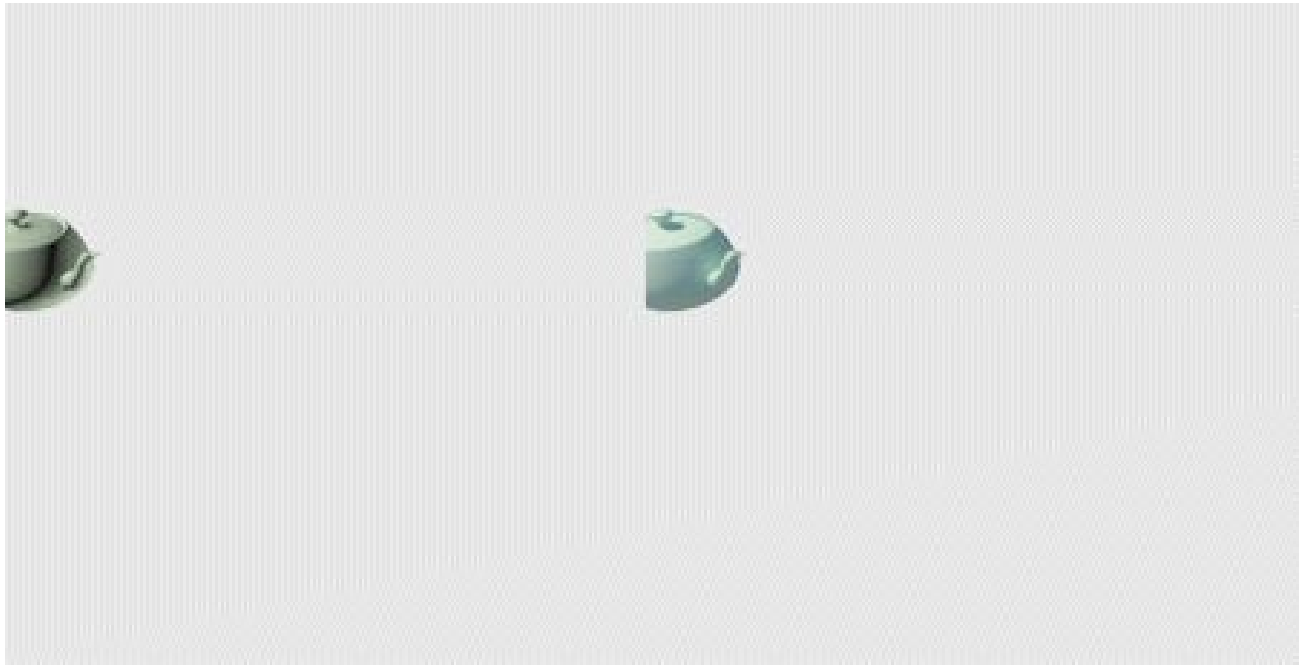
Demo / open Template_Exterior_Animation_VraySun.max in the B-8 animation rendering folder


Object motion blur VS Camera motion blur

Object motion blur VS Camera motion blur

object motion blur VS camera motion blur git link





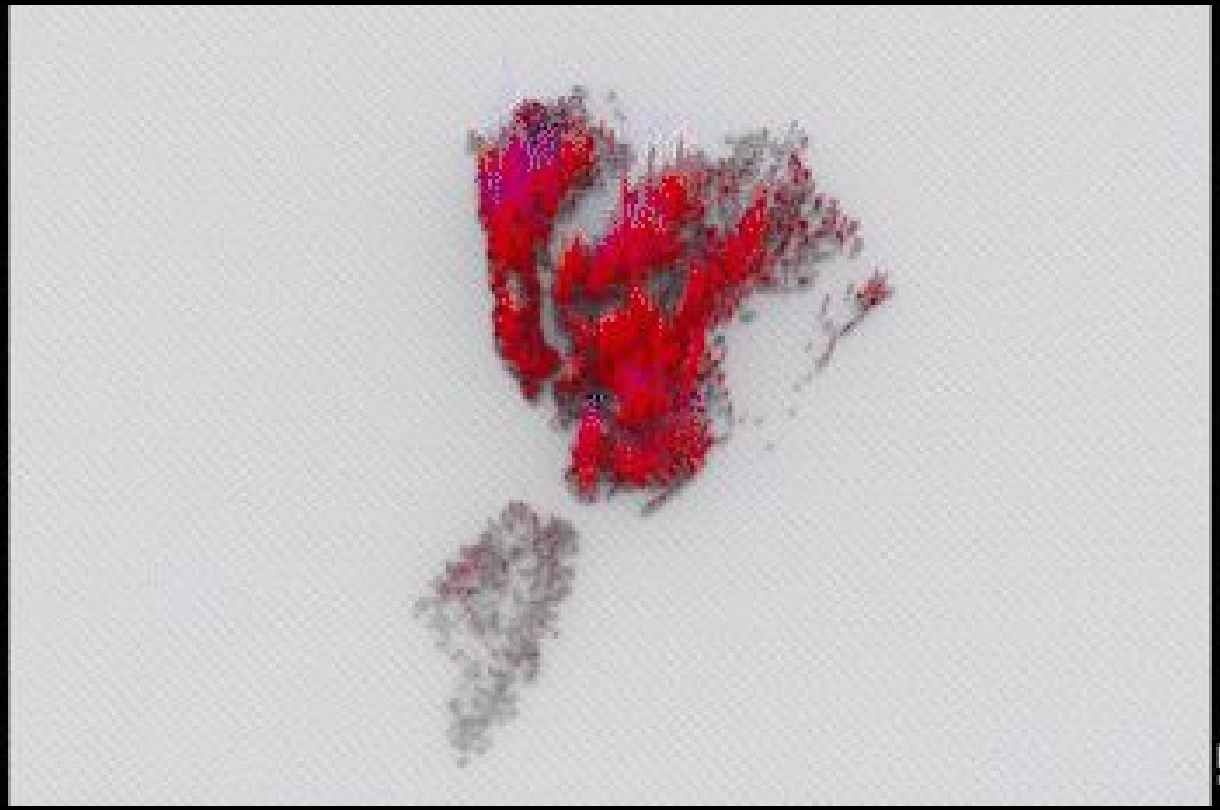
Demo / open Tip Object motion blur VS Camera motion blurWithVRay.max in the B-8 animation rendering folder

B-9_Interior Animation

sequence mapping(video), rotation ... git link

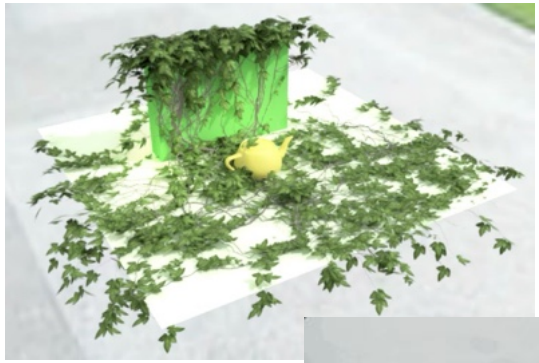
Demo / open B-9_Interior Animation done.max in the B-9_Interior Animation folder

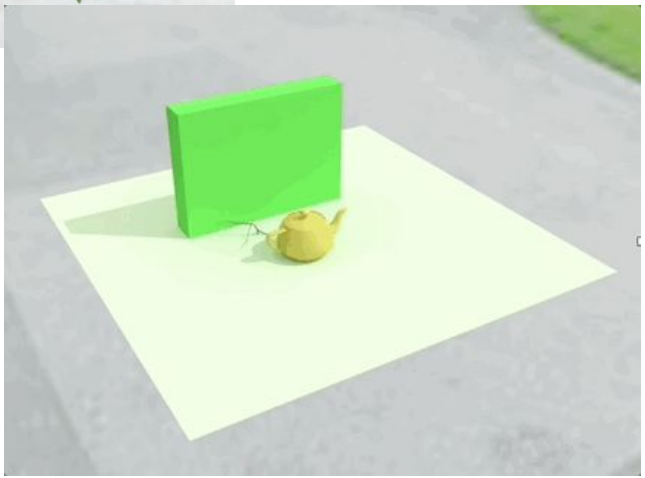
Overview: data visualization



A-4_ivyGenerator

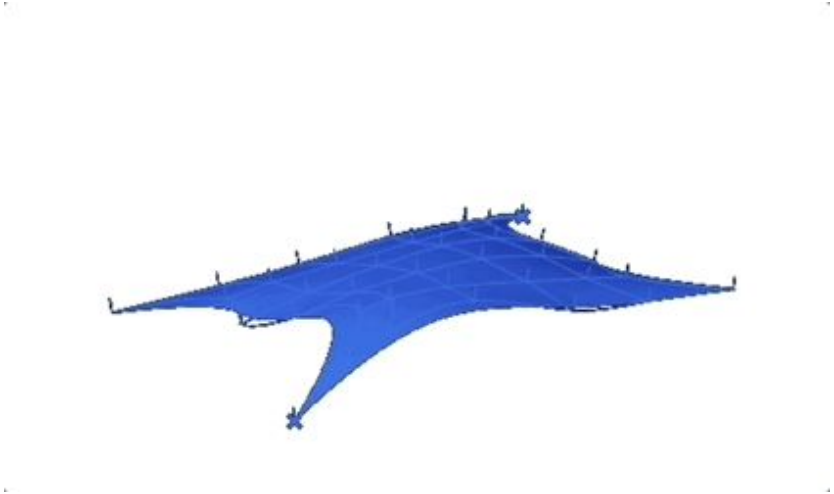
displacement map / UVW map / ivy plugin git link





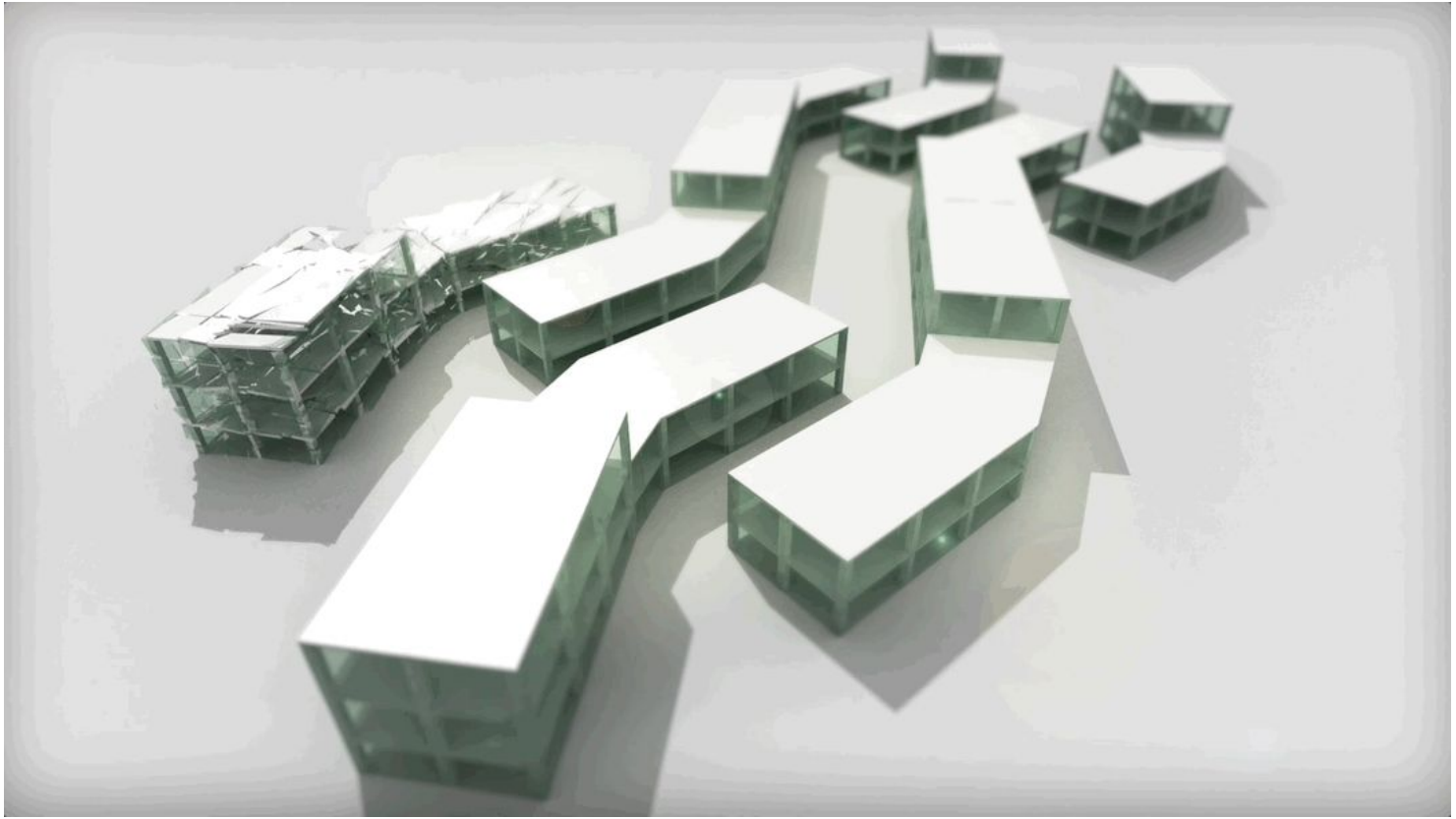
Demo / open A-4_ivyGen_start.max file in the A-4_ivyGenerator folder

A-4 animation with Grasshopper

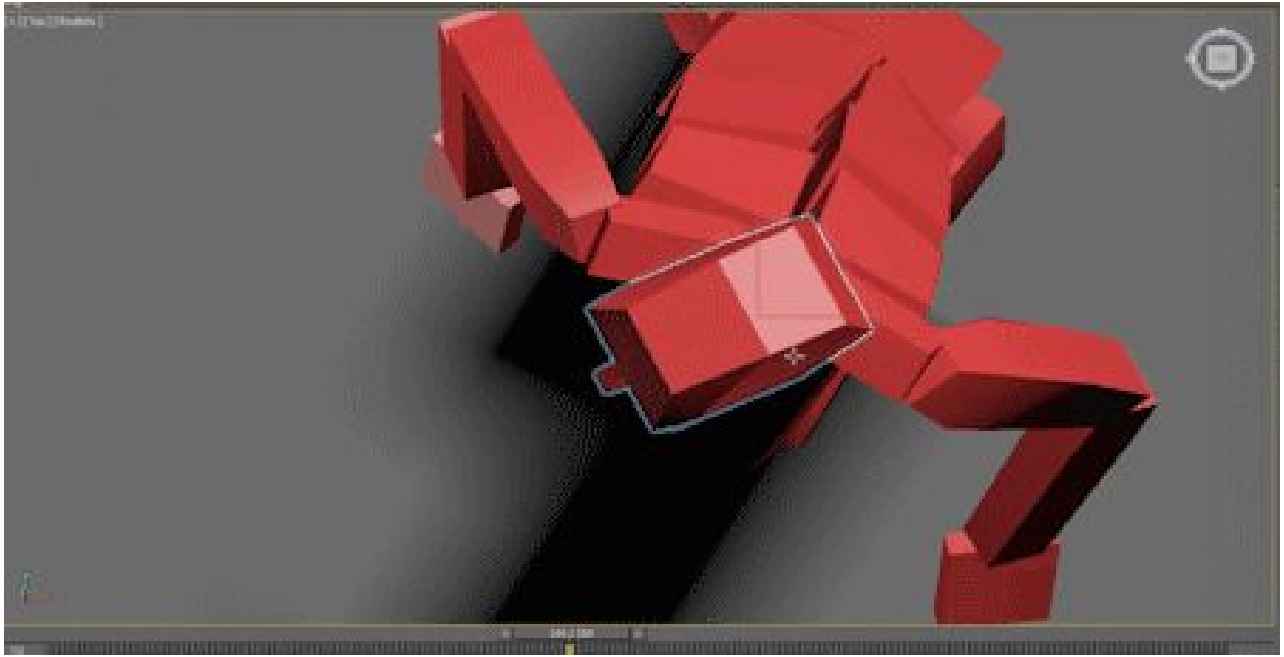


Demo / open A-4 GHAnimationStart.aep in the A-4 Animation with Grasshopper folder

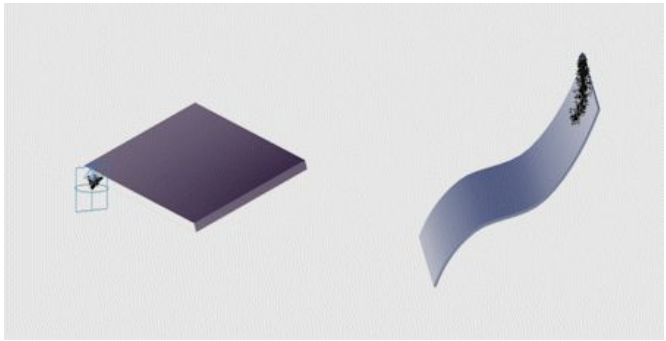
Overview Animation by Simulation

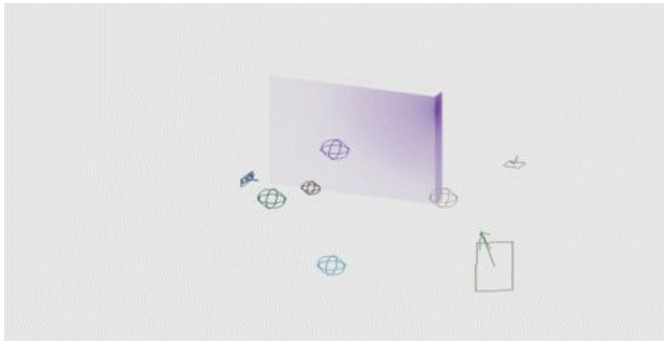


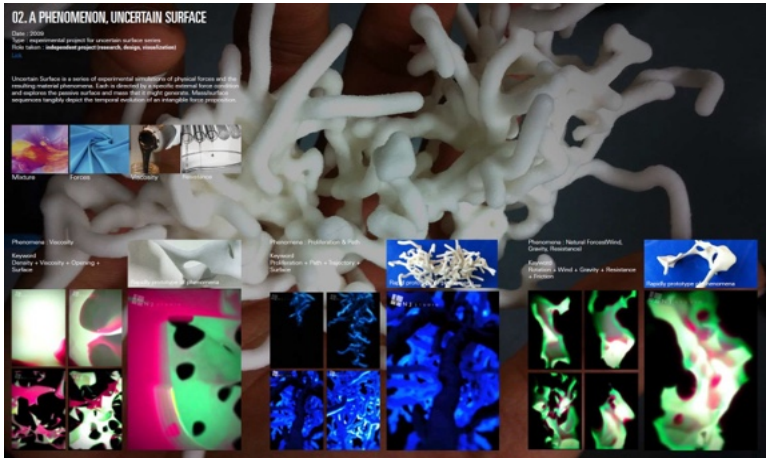
Overview event / Character animation

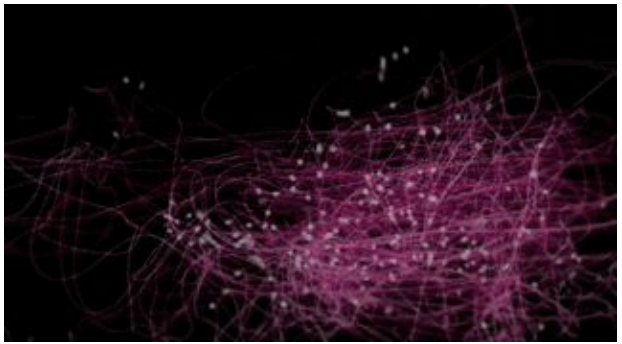


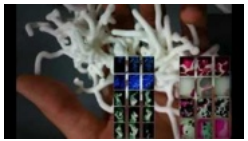
B-11_ParticleSystem









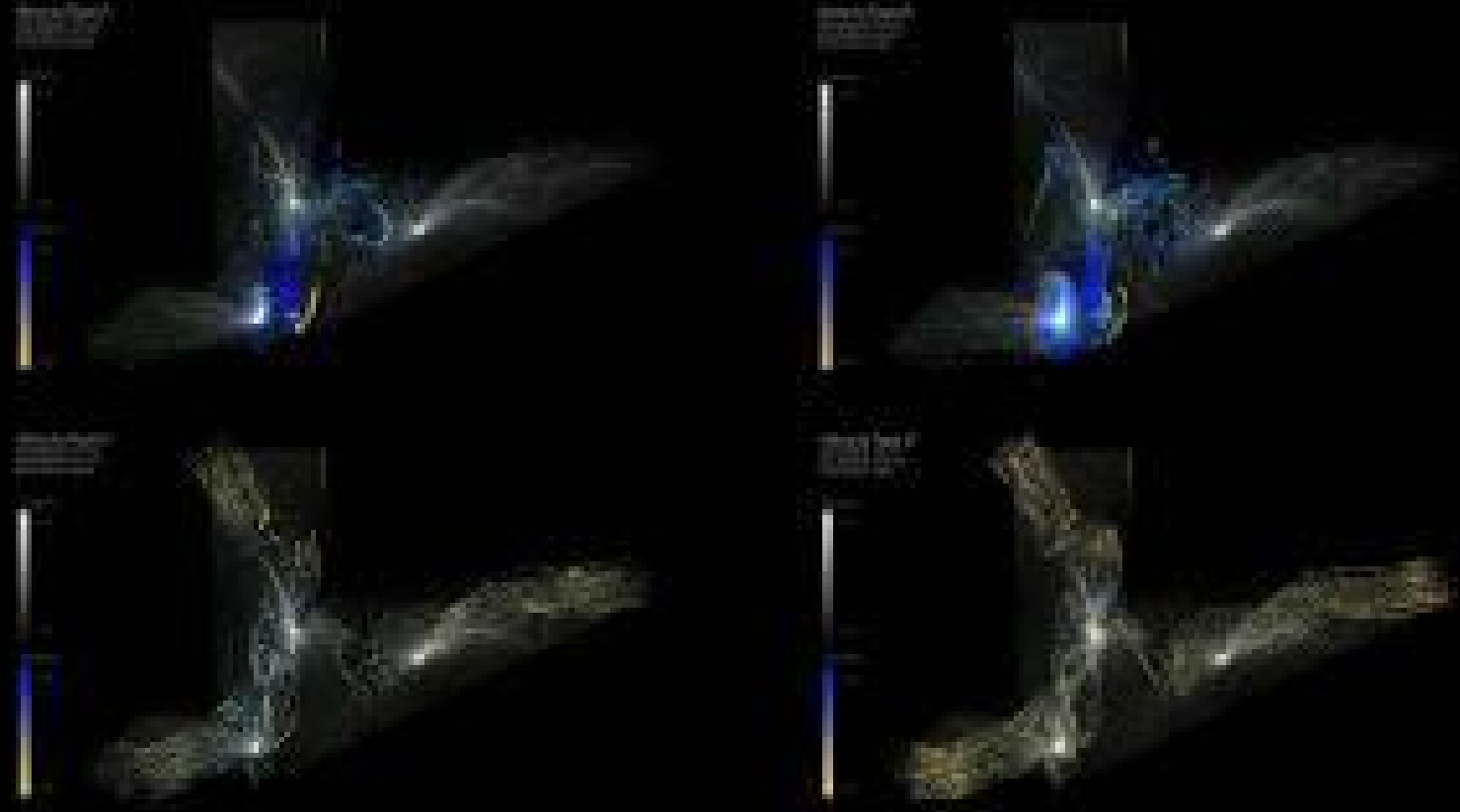


particle system

force-driven particle, event-driven particle system ...
git link

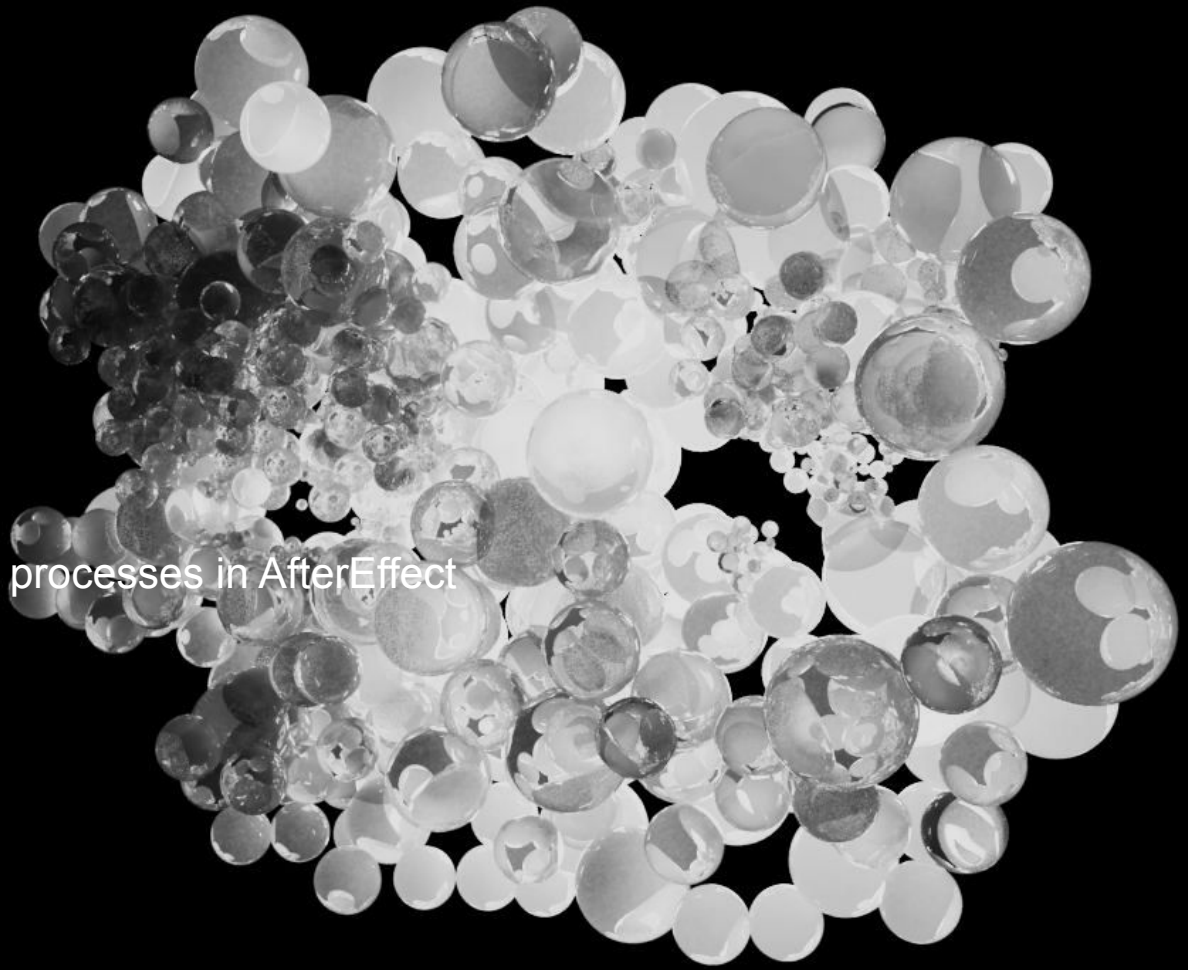
Demo / open B-11_Particle_Ex_A_Done_01.max in the B-11_ParticleSystem folder


Multi-agent particle
Velocity Type A on the vector field
Grid spacing: 80.0 unit
grid padding: 5.0 unit
Fluid motion: active
Density
max
min
Velocity
active
static



PART C

general post-production working processes in AfterEffect



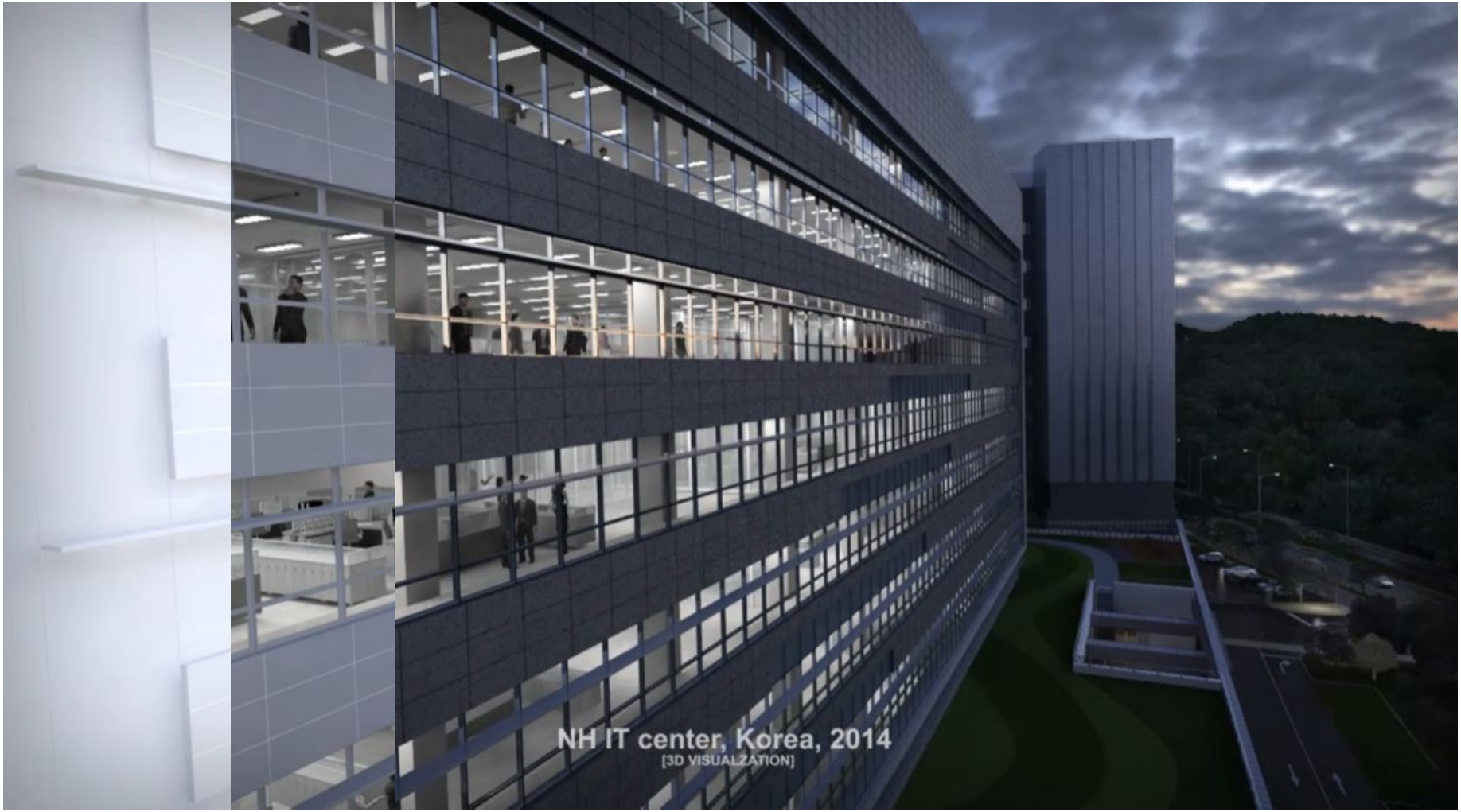
For Urban, architecture and landscape architecture

INTRODUCTION TO POST-PRODUCTION

Post-production is part of the process of filmmaking, video production and photography. It occurs in the making of motion pictures, television programs, radio programs, advertising, audio recordings, photography, and digital art. It is a term for all stages of production occurring **after shooting or recording individual program segments**.[1]

Post-production for video

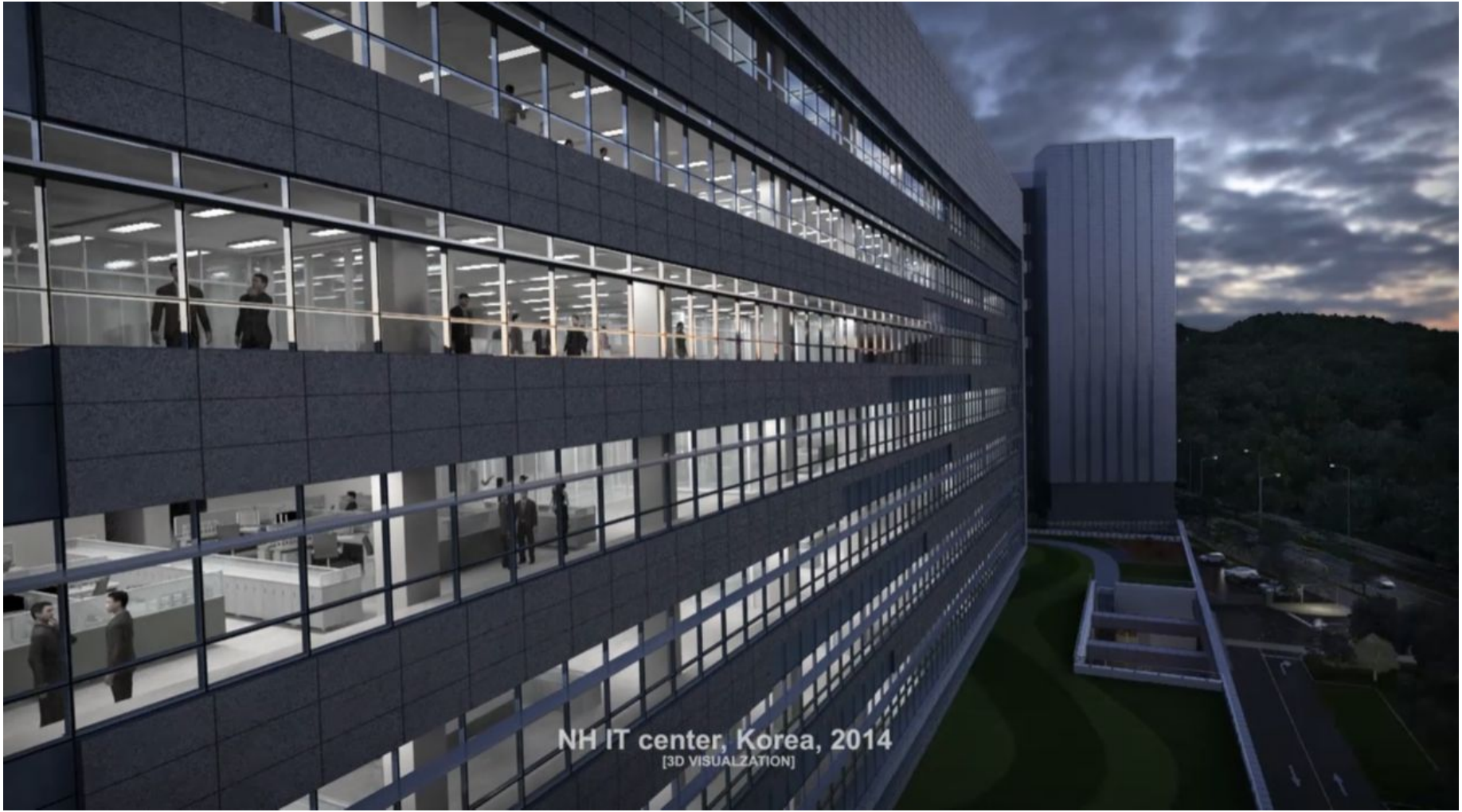
- git link, Animation in Aftereffect
- git link, Editing and Effecting in AE
- element rendering


NH IT center, Korea, 2014
[3D VISUALZATION]


NH IT center, Korea, 2014
[3D VISUALZATION]


NH IT center, Korea, 2014
[3D VISUALZATION]


NH IT center, Korea, 2014
[3D VISUALZATION]


NH IT center, Korea, 2014
[3D VISUALZATION]

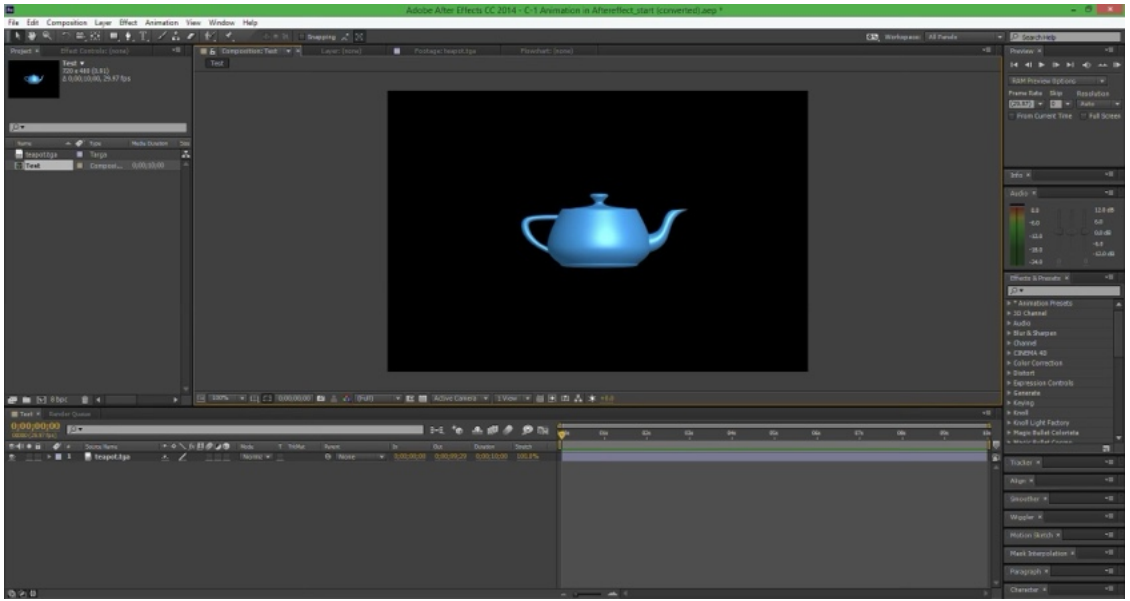

NH IT center, Korea, 2014
[3D VISUALZATION]

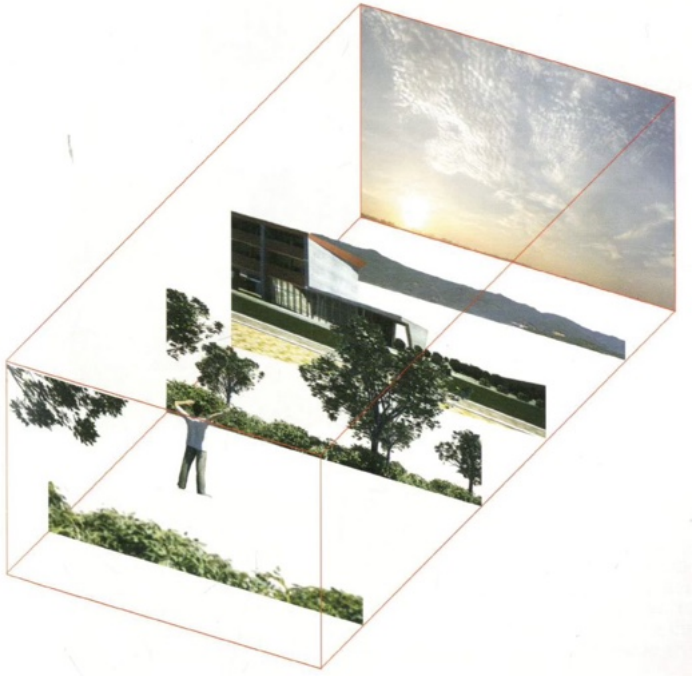

NH IT center, Korea, 2014
[3D VISUALZATION]


NH IT center, Korea, 2014
[3D VISUALZATION]


NH IT center, Korea, 2014
[3D VISUALZATION]

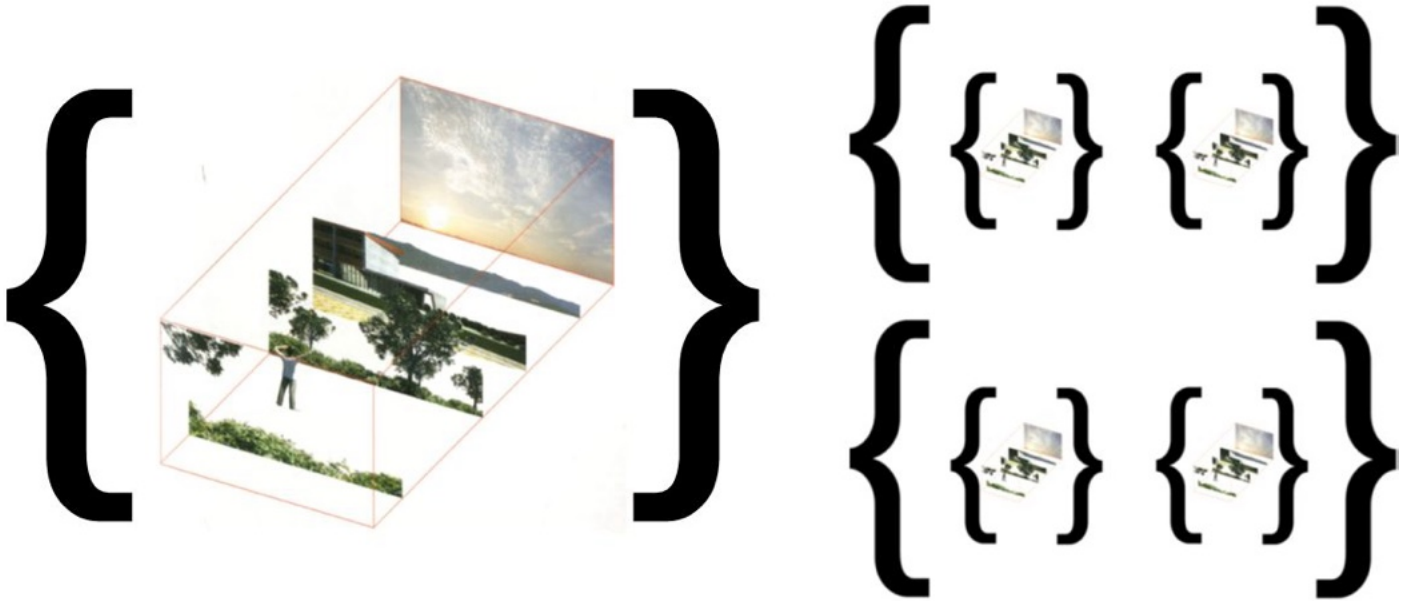
C-1 Animation in Aftereffect (basic Motion Graphic)





Demo / open C-1 Animation in Aftereffect_start.aep in the C-1 Animation in Aftereffect folder

A-3- understand of layer and Composition in AfterEffect



Demo / open A-3 Composition in Aftereffect_start.aep in the A-3 Composition in Aftereffect folder

A-3- understand of layer and Composition in AfterEffect

Demo / open A-3 Composition in Aftereffect_start.aep in the A-3 Composition in Aftereffect folder

C-2 Editing and effecting with sequences images

https://namjulee.github.io/njs-lab-public/work?id=2007-demo-reel-visualization

Demo / open C-2 Editing and Effecting in AE_start.aep in the C-2 Editing and Effecting in AE folder

C-3 Animation from a image

* The Reverse Evolution of Walls

While the walls standing on the firm ground supported the weight, protected from strong wind, and separated the space, the walls that will be taking these responsibilities under the ocean shall be examined in different aspects.

Roles of the wall module:
1) Each of air bladder like soft wall modules will minimize the impact from outer forces which will eventually reduce the possibility of structures getting inundated.

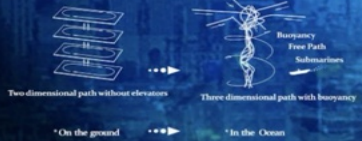
2) These wall modules will also be able to protect the structures from extreme temperatures and direct sunlight coming down from surface of the water.

* The Reverse Evolution of Columns

Columns are very important supporting component of a building. The formation and roles of these columns will have to be changed as they go deep inside the ocean. Rather than supporting against the movement of ocean currents, the columns will be linking each unit and pathways like chains.

* The Reverse Evolution of Paths

Our movements on the ground have limits, since we only move in two-dimensional pathways affected by gravity. However, in water, with the forces of gravity and buoyancy, we will be able to move in three-dimensional. For an instance, elevators in water will not be limiting its moving directions to up and down, but be expanding its movements in many different directions.



* The Reverse Evolution of Units

Usually we stack up the units on the ground, but in water, we can hang. Some units are job components, i.e. livingroom, kitchen, bathroom, bedroom, etc., and some, just taking the part as joint. Each unit will not only be able to move around as a single unit, but to maintain itself by taking old modules out and putting new modules in.

Demo / open C-1 Animation in Aftereffect_stack.aep in the C-1 Animation in Aftereffect folder

* PLAN

* Energy Strategy

There are three different types of energy: sea level, inside of ocean and ground.

Sea Level

From the surface of the ocean, the electric power will be generated by solar, wind and tidal power. Also, several different types of farming like fish/oxygen farming, floating greenhouse, etc., will be possible for us to have feasible underwater living space.

In the Ocean

Under water, there will be a serious research like thermal difference generation using the temperature differences of upper and lower parts of the ocean. Not only was that, swirling water created by the temperature differences was used for the means of transport. Furthermore, for visual entertainment, and also for the natural source of food, the customized fish farming will be simulated around the structures that are stretched out under water.

Under the Ocean Floor

Geothermal energy and fossil fuel were extracted from the ocean floor and were used for generating the energy we can utilize.
The unique moving space, that can be transferred and multiply, will be used as a link to connect to buildings on the ground that will be sunken under the ocean.

* Sustainable Interaction

We, human beings, are one of the living beings like earth(ground), mountain, ocean, plates, river, tree and etc. that must accept and adapt the changes in the future. The changes engendered by accelerated global warming and imbalance of ecosystem may demand us to modify our life style, and maybe, even more.
Energy crisis epoch will definitely come, and we need to use the massive natural resources from the ocean efficiently. Rather than using our natural resources for our selfish needs, we need to learn the way to harmonize with the natural elements.

Chroma key

https://en.wikipedia.org/wiki/Chroma_key

https://namjulee.github.io/njs-lab-public/work?id=2009-invisible-dream-film

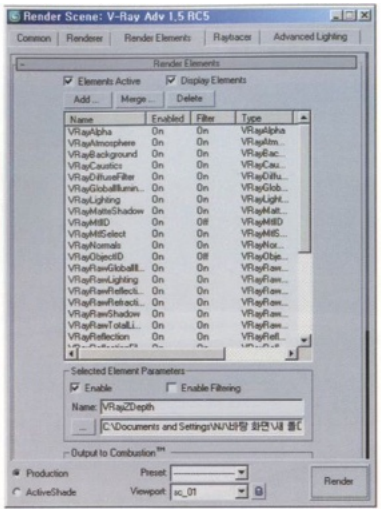
C-4 keying effect

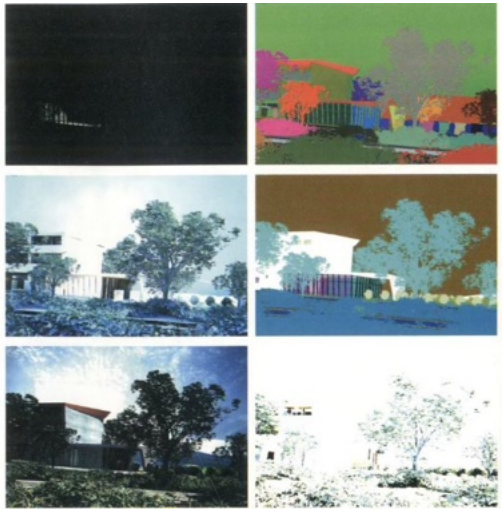
Demo / open C-4_KeyingEffect_done.aep in the C-4 keyingEffect folder

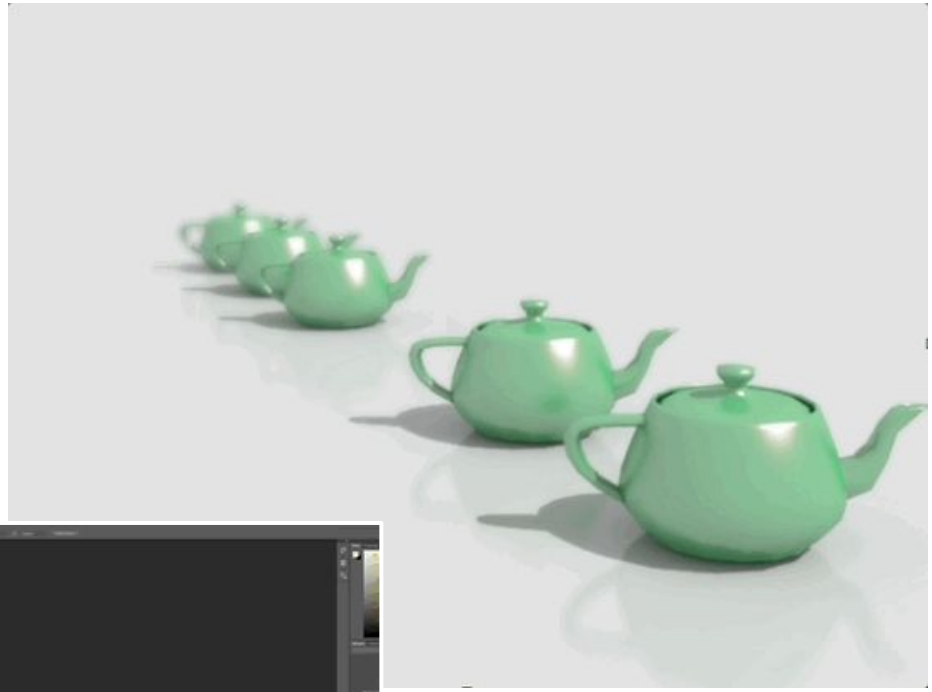
C-5 Channel Element rendering

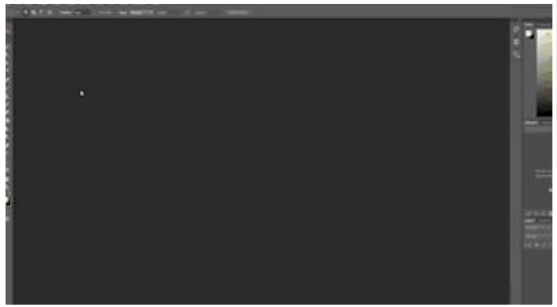
Demo / open C-5 Channel_Element rendering_done.aep in the C-5 Channel_Element renderingfolder

C-5 Channel Element rendering









Demo / open C-5 SimpleExampleElement_start.max in the C-5 Channel_Element rendering folder

C-6 Matte/Shadow

Demo / open C-6_MatteShadow_done.aep in the C-6_MatteShadow folder

Tip Anti-Aliasing with background color

Demo / open C-6-1_MatteShadow_start.max in the C-6-1_Anti-Aliasing folder

C-7 Track Motion / Stabilize Motion

Demo / open C-7_track&stabilize_done.aep in the C-7_Track_Motion_Stabilize_Motion folder

C-8 The smoother / The wiggler

Demo / open C-8_Wiggler_done.aep in the C-8_The smoother The wiggler folder

B-1 Stabilize Motion

Demo / open B-1_track&stabilize_done.aep in the B-1_Track_Motion_Stabilize_Motion folder

Overview plugins for AfterEffect

videos in the C-9_Overview Plugins folder

B-8 AfterEffect Script

Time = 2 sec, Transition = 0.9 sec

Time = 4 sec, Transition = 2 sec

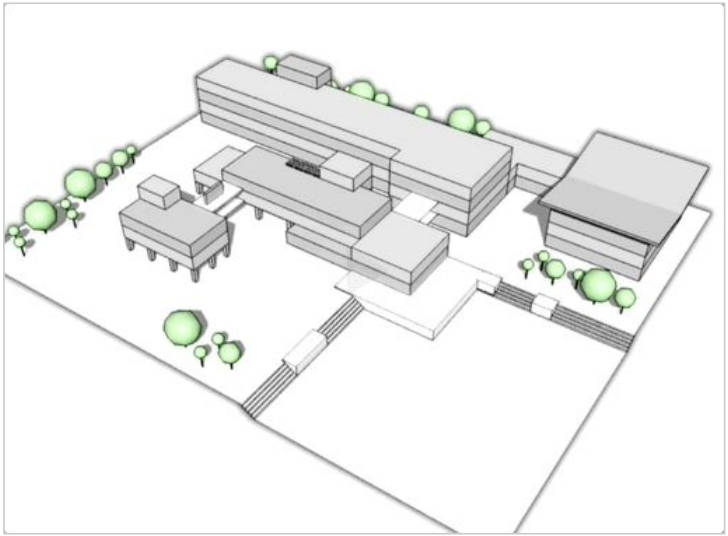
Demo / open B-8_JSX_Start.aep in the B-8_VideoFromImages(AEScript) folder

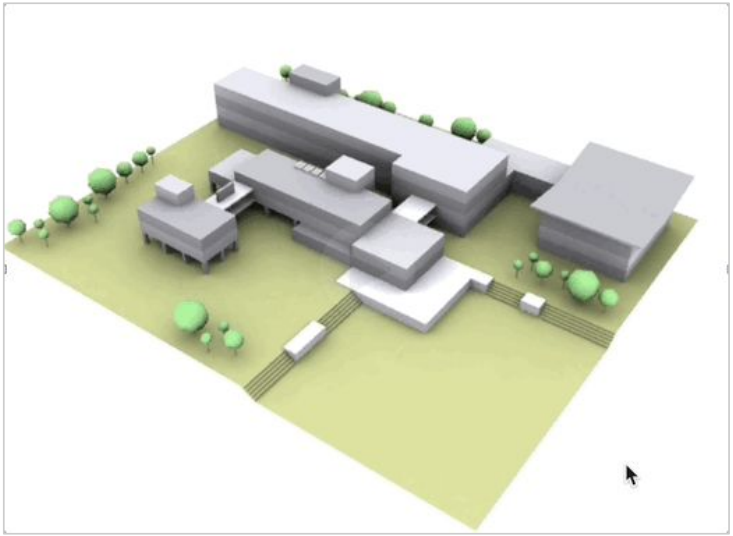
PART D

Case study

Case study: Camera Animation

Camera animation git link





Dolly Shot: Smooth camera movement on a track (forward, backward, or sideways).

Tracking Shot: Follows a moving subject, keeping them in frame.

Zoom In/Out: Adjusts lens to make the subject appear closer or farther.

Pan: Horizontal camera rotation from a fixed point.

Tilt: Vertical camera rotation from a fixed point.

Handheld: Unstabilized camera, creates a shaky, realistic feel.

Steadicam: Stabilized camera movement, smooth and dynamic.

Crane Shot: Dramatic vertical or sweeping movement using a crane.

Case study: Seasonal animation

Seasonal animation git link

Cut - The most basic type of transition—an instant change from one shot to another.

Dissolve - One shot gradually fades out while the next shot fades in, overlapping for a moment. Often used to show a passage of time or a soft transition.

Fade In - A shot gradually appears from a black (or white) screen, often used at the beginning of a scene or film.

Fade Out - A shot gradually darkens to black (or white), usually signaling the end of a scene or sequence.

Wipe - One shot is replaced by another through a sliding motion across the screen. Often used in stylized or retro edits.

…

Demo / open D-2_CaseStudy_Seasonal animation.aep in the D-2_CaseStudy_Seasonal animation folder

Case study: Lighting Simulation

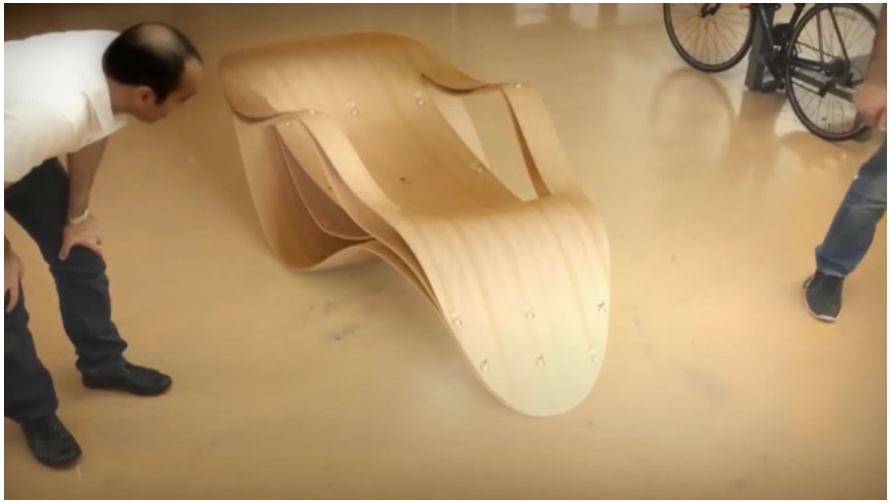
Time-Lapse animation

daylight simulation with EPW, git link

Demo / open B-11_Particle_Ex_A_Done_01in the D-3_CaseStudy_TimeLapseAnimation/D3-2_post-production folder

Case study: Digital mockup

composite rendering sequences with movies git link



카메라 트래킹 / 디자인 시각화 / Digital Mockup / Design Visualization - https://namjulee.github.io/njs-lab-public/lecture?id=HThJq67Z_IM

NJSTUDIO 2015 DIGITAL MOCKUP DEMO REEL

FIFTH EDITION, SELECTED WORKS SINCE 2004

n.ninja@gmail.com
www.njstudio.co.kr

DREAM PAVILION ANIMATION

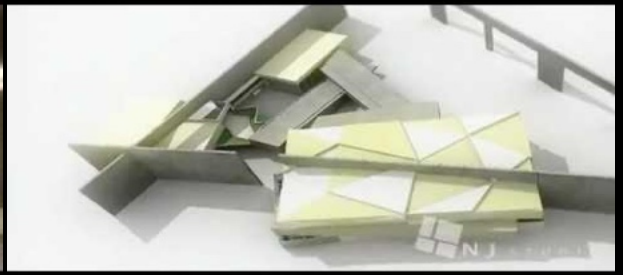
composite rendering sequences and images for animation

https://namjulee.github.io/njs-lab-public/work?id=2016-hanger-bar

Reference : https://computationaldesign.tistory.com/11

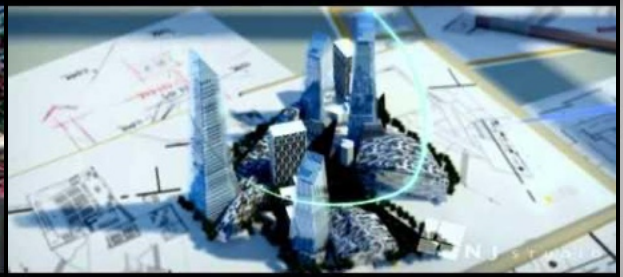
NJSTUDIO DEMO 2004

NJSTUDIO DEMO 2005



NJSTUDIO DEMO 2006

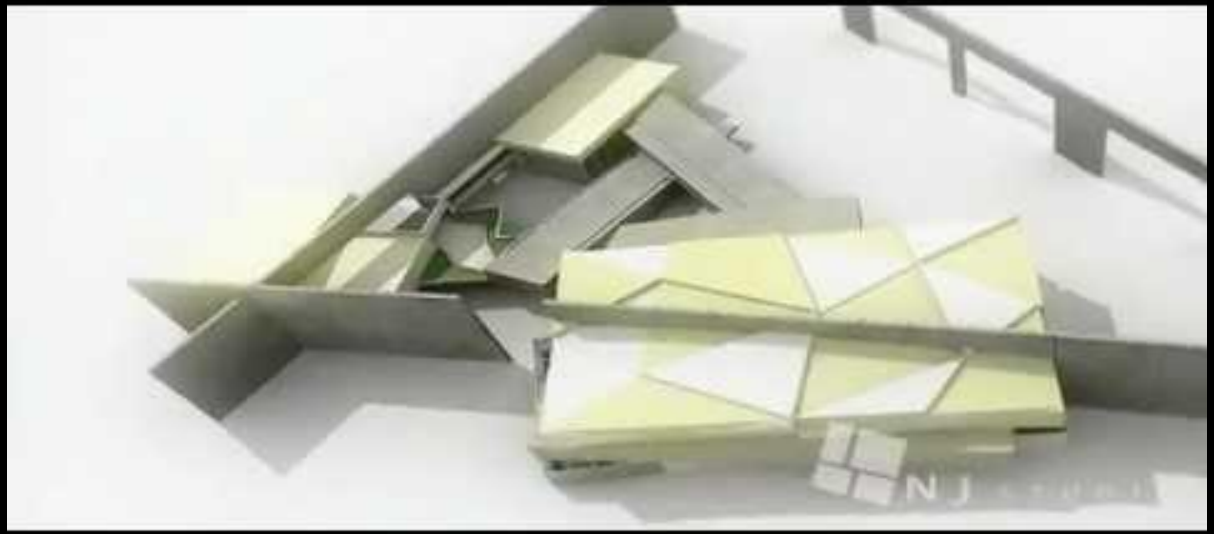
NJSTUDIO DEMO 2007



NJSTUDIO DEMO 2008

NJSTUDIO DEMO 2015

Design Visualization 2004



2005 DA Competition, 1st Winner Polygon Culture Center

Introduction to Design Visualization

Harvard GSD, MIT SA+P

Link - https://namjulee.github.io/3d-visualization-harvard-gsd.github.com/
Video - https://youtu.be/3VeLfmt2N-0
Git - https://github.com/NamjuLee/Harvard-GSD-Workshop

Download:

Content(pdf)

Example files

BasicAnimation.pdf

BasicParticleSystem.pdf

Workshop at Harvard Graduate School of Design

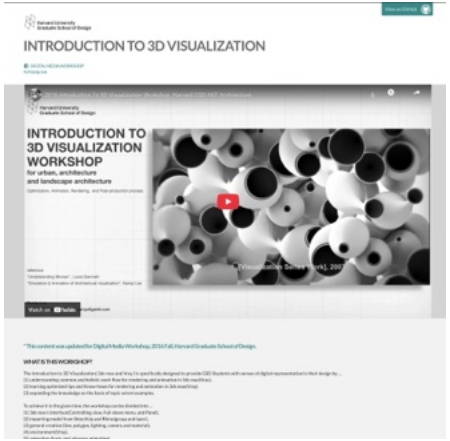
Please use this content only for educational purpose, not for commercial one

The aim of this workshop is to provide students with a knowledge of 3D visualization and Post-Production in architecture, landscape architecture and urban design domains.

- The rendering sequence files are excluded because they are simple too big.
- some files above 100mb are excluded because of the limitation. If you need to get entire exercise files, please contact me nj.namju@gmail.com

https://namjulee.github.io/njs-lab-public/work?id=2015-introduction-to-3d-visualization-workshop-harvard-gsd

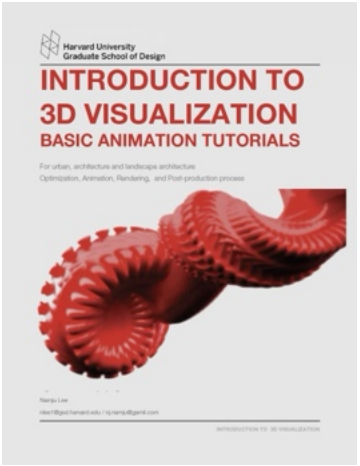
Materials



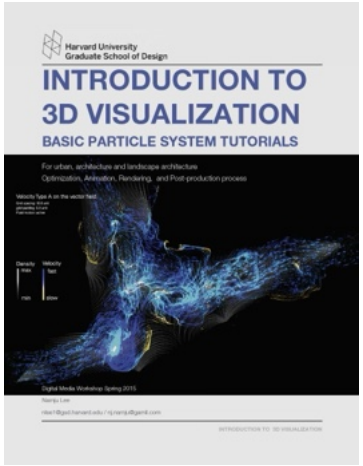
https://namjulee.github.io/3d-visualization-harvard-gsd.github.com/

Example files

https://github.com/NamjuLee/3d-visualization-harvard-gsd.github.com/blob/gh-pages/pdf/%5B2016_Fall_IntroductionTo3DVisualizationWorkshop_HarvardGSD.pdf



https://github.com/NamjuLee/IntroductionToDesignVisualization/blob/master/%5BPDF%5D/BasicAnimation.pdf



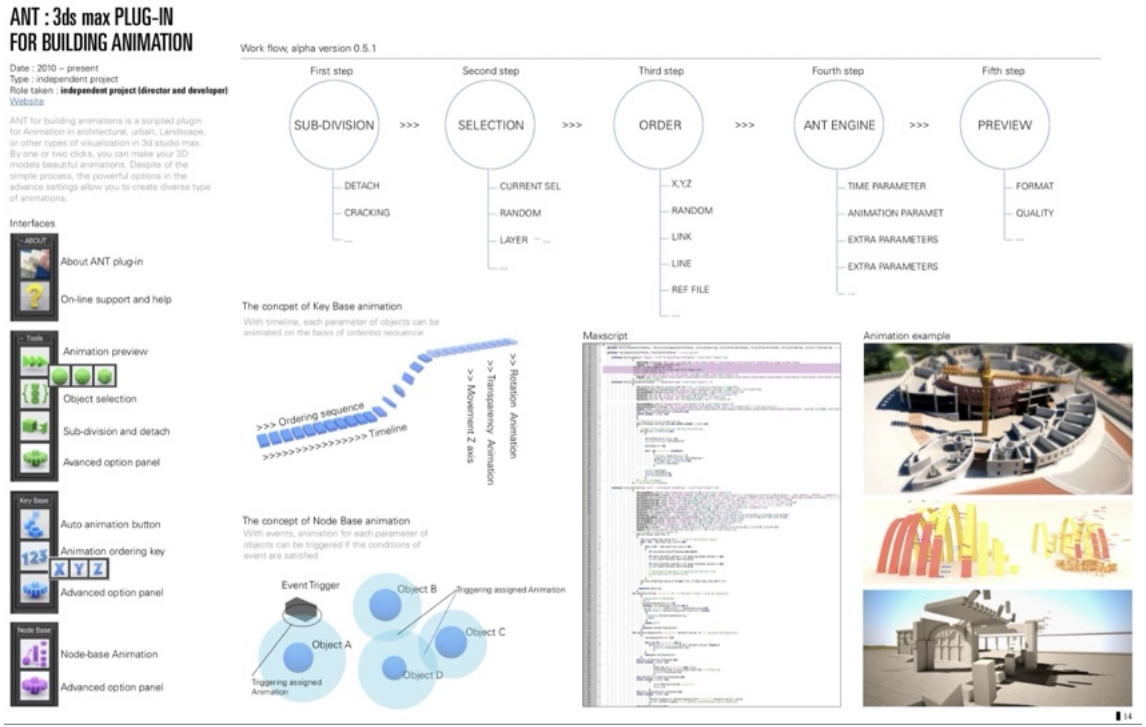
https://github.com/NamjuLee/IntroductionToDesignVisualization/blob/master/%5BPDF%5D/BasicParticleSystem.pdf

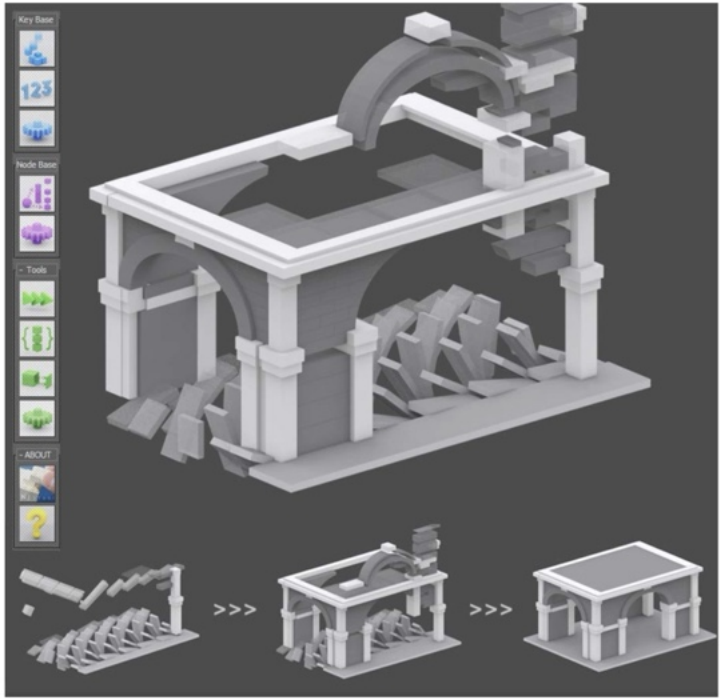
ANIMATION & VISUALIZATION

Maxscript & scripted plugin

http://www.njstudio.co.kr/main/project/2015_Demo_Vis/2015_Demo_Vis.html

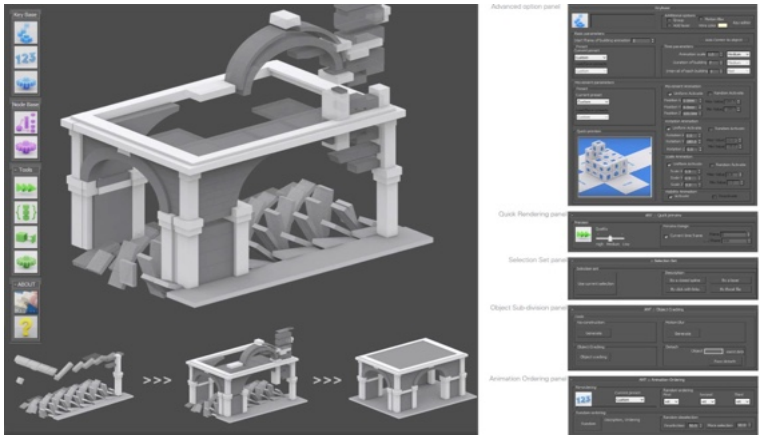
https://namjulee.github.io/njs-lab-public/work?id=2013-ants-development





ANT : 3ds max PLUG-IN

FOR BUILDING ANIMATION



maxscript & scripted plugin

maxscript for automation or procedural design

Geometry

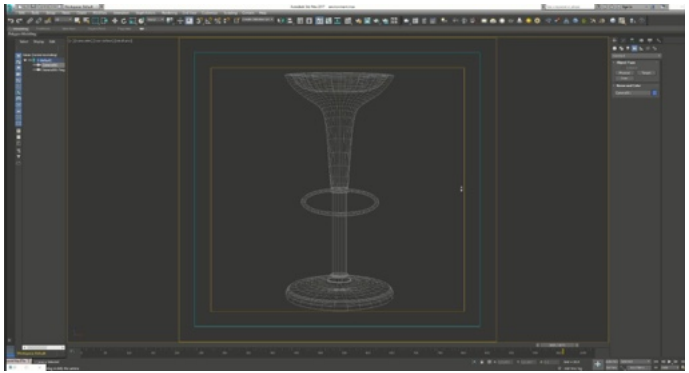
Mesh & Polygon modeling

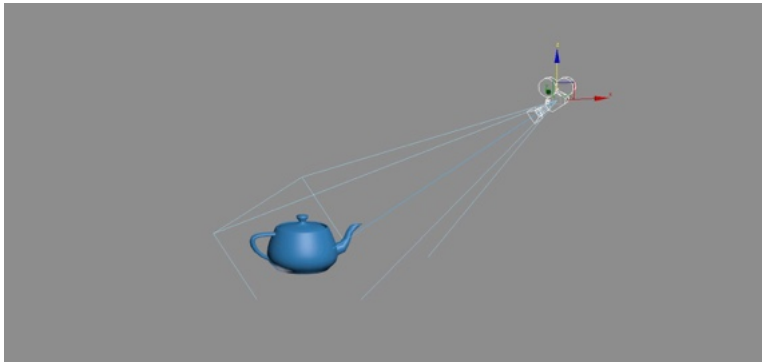
modification

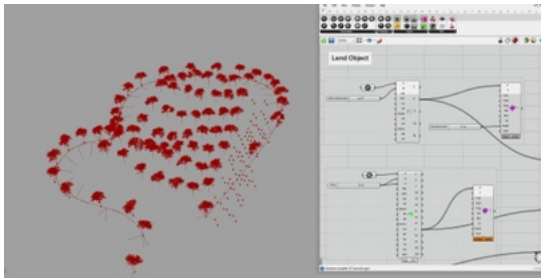
Environment

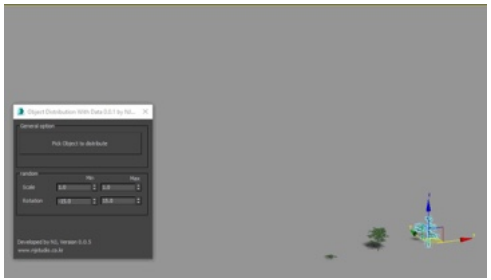
Rendering

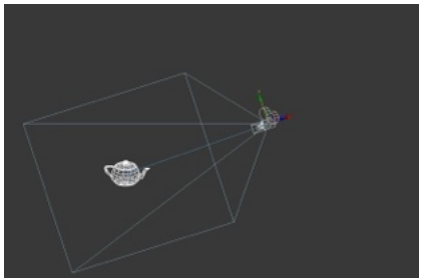
Camera

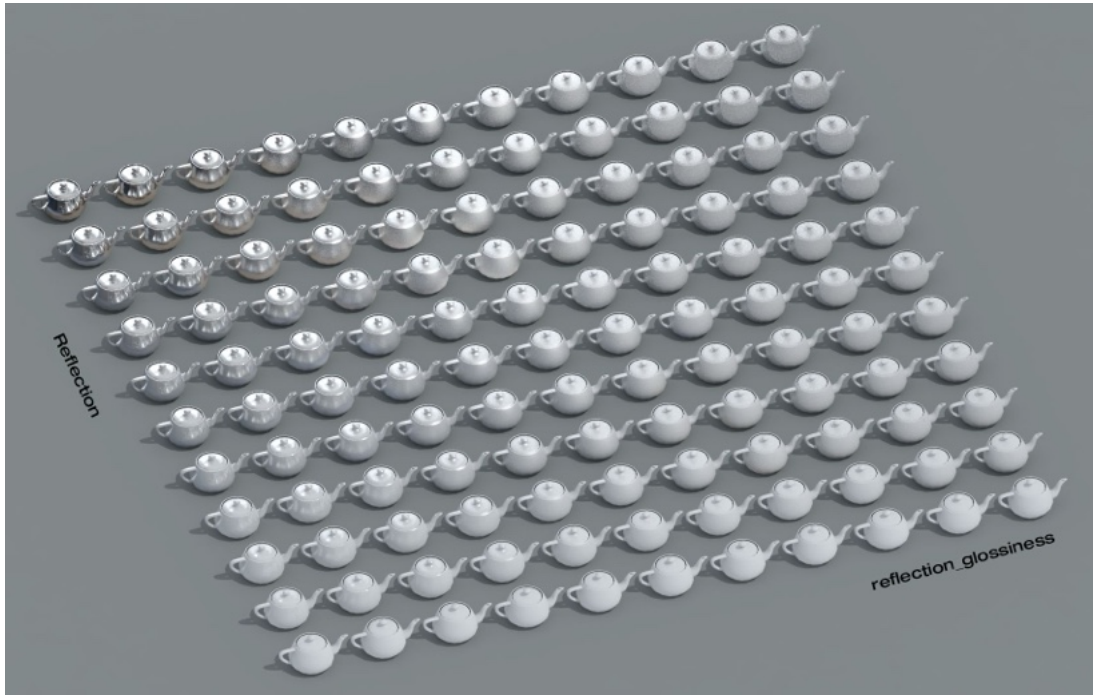


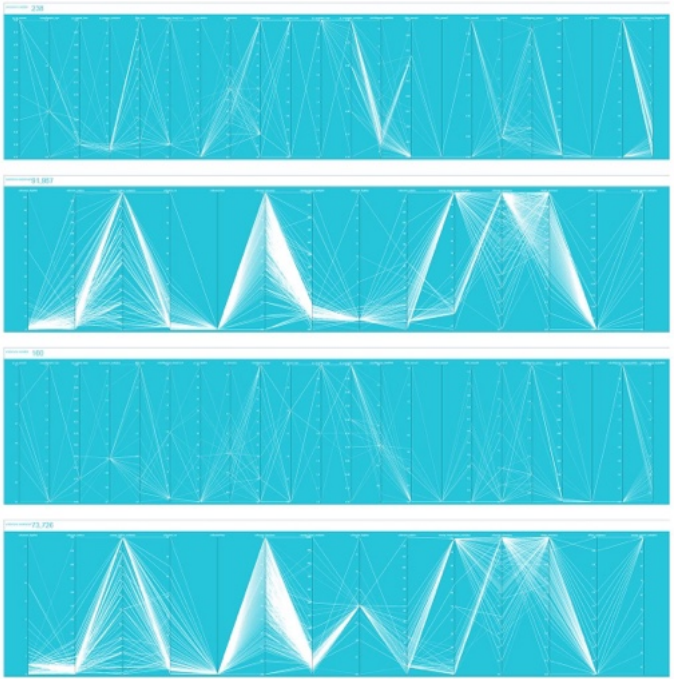










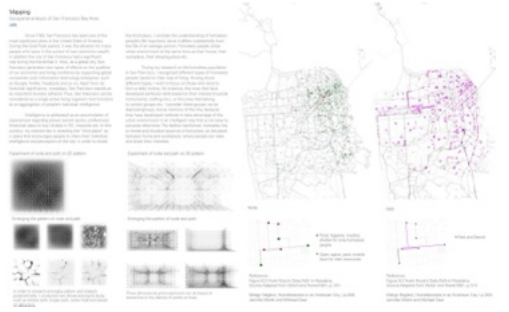


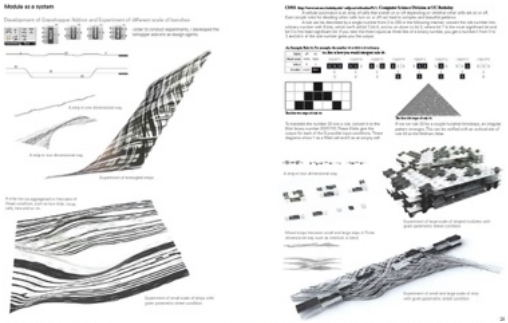
01. STREET IN OFFICE / OFFICE ON THE STREET

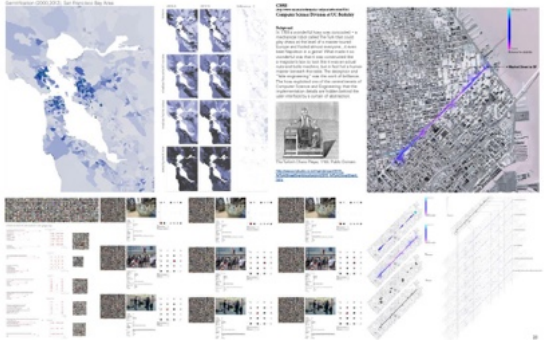
Data-driven design research, M.Arch program

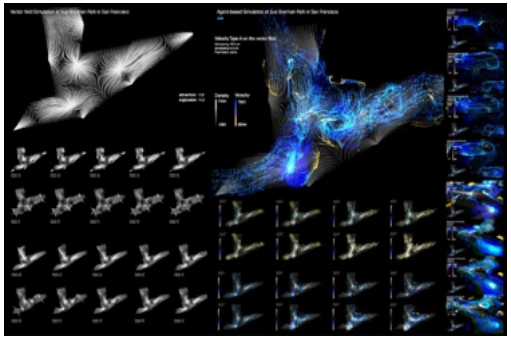
Link: https://namjulee.github.io/njs-lab-public/work?id=2015-third-place-on-park

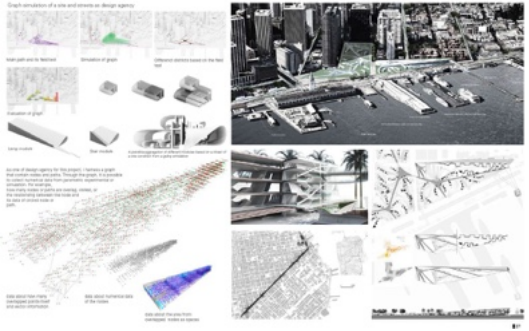
Design Visualization

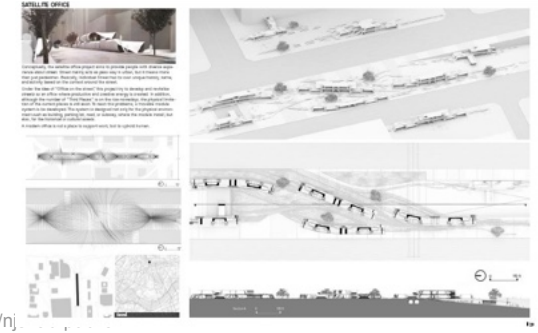


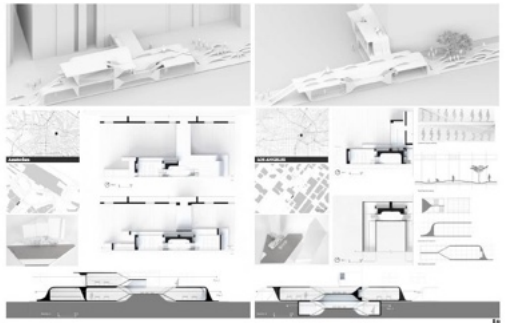













Time lapse for February, 2015
Quantity: Illuminance
Style: colored
scale: Logarithmic
Min
Max
5000 lx
10000 lx
Physical Scale: 10 cm
Shadow simulation
MAPPING
DESIGN AGENCY
MODULE , DETAIL
IMPLEMENTATION

Design Visualization

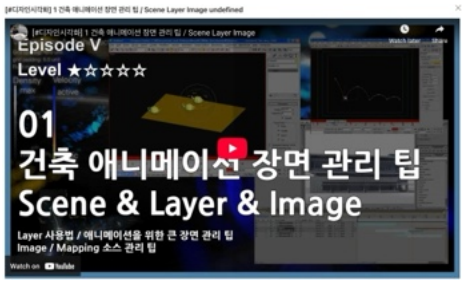
Demo reel Visualization, 2006 -
https://namjulee.github.io/njs-lab-public/work?id=2006-demo-reel-visualization

Holme Building Visualization -
https://namjulee.github.io/njs-lab-public/work?id=2011-holme-building-and-master-plan-of-university-of-sydney

3ds max

https://computationaldesign.tistory.com/34?category=937139

디자인시각화] 0 건축 애니메이션 (3ds max, AfterEffect) 워크숍 설명 - https://namjulee.github.io/njs-lab-public/lecture?id=5zarCyl8IgY



디자인시각화] 1 건축 애니메이션 장면 관리 팁 / Scene Layer Image - https://namjulee.github.io/njs-lab-public/lecture?id=WkHi9vZp574

디자인시각화] 2. 3ds max 애니메이션 그리고 예제 / key animation - https://namjulee.github.io/njs-lab-public/lecture?id=dtjYx1PZcek

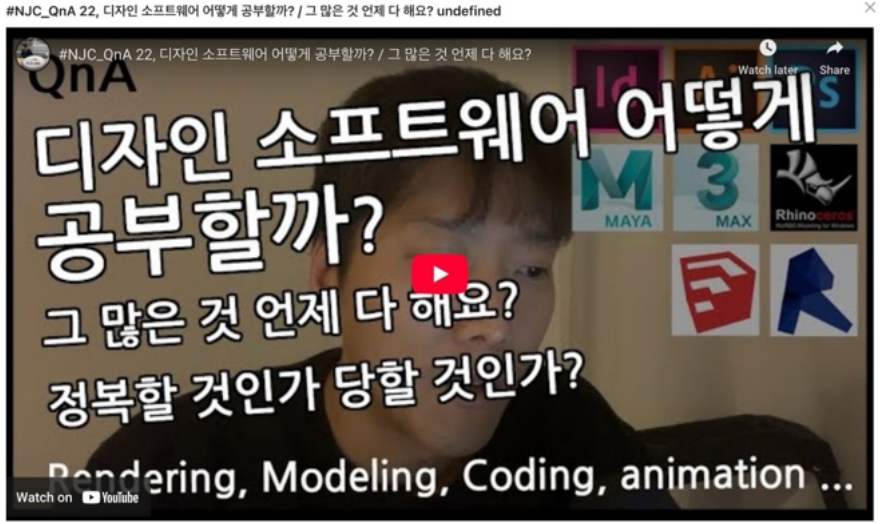
디자인시각화] 3. 파티클 애니메이션 / Particle Animation using 3ds max - https://namjulee.github.io/njs-lab-public/lecture?id=SlUTdPAm6qY

디자인시각화] 4. 조경(환경) 만들기 - 3ds max plugin - https://namjulee.github.io/njs-lab-public/lecture?id=MgvVpq9b3SU

디자인시각화] 5. 애프터 이펙트 동영상 편집, 건축 애니메이션 - https://namjulee.github.io/njs-lab-public/lecture?id=sSwqghful_Q

Reference

컴퓨테이셔널디자인 19] 건축 3D 렌더링에 관한, 어느 건축가의 질문들… / 건축 시각화 - https://namjulee.github.io/njs-lab-public/lecture?id=3YHMMectUTs



NJC_QnA 22, 디자인 소프트웨어 어떻게 공부할까? / 그 많은 것 언제 다 해요? - https://namjulee.github.io/njs-lab-public/lecture?id=ozQrLtKO1Rs

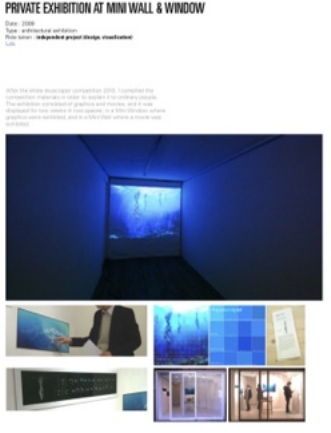
컴퓨테이셔널디자인 17] 도시, 건축 렌더링 팁 / Architectural & Urban Rendering tips / 건축 시각화 - https://namjulee.github.io/njs-lab-public/lecture?id=L2iT4R-5loM

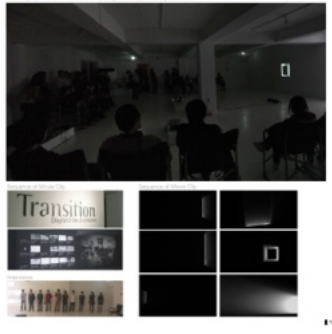
EXHIBITION

as a director

http://www.njstudio.co.kr/main/project/2010_Korea%20Traditional%20House/2010_Korea%20Traditional%20House.html

http://www.njstudio.co.kr/main/project/2009%20-%20A%20intented%20Spacee/2009_A_intentedSpacee.html





01. A Construct The Koreas (Never) Made Together: Deconstructing the DMZ For The Imaginary

Date : 2014
Type : architectural exhibition
Role taken : **Visualization**
Link

Prof. Dongsei Kim's animation in the Crow's Eye View: The Korean Peninsula at 14th International Architecture Exhibition, Venice, Italy. June - November, 2015.

This work was part of the Korea's pavilion "Crow's Eye View: The Korean Peninsula" curated by Minsuk Cho, Hyungmin Pai, and Changmo Ahn with deputy Curator: Jihoi Lee. The pavilion was awarded the Golden Lion for the best national pavilion.

"A Construct The Koreas (Never) Made Together: Deconstructing the DMZ For The Imaginary"
By Dongsei Kim. Assisted by Namju Lee and Eleni Gianpapa. 2014.
Music by Johnny Ripper, "In a dream" (02:46) from "soundtrack for a film that doesn't exist."
Special thanks to: Namju Lee, Eleni Gianpapa, and Sandro Marpillero for their support in producing this work.

More information:
Refer to Domus articles Korean modernism and Crow's Eye View for background information.
Monocle Films Video: Venice Architecture Biennale - National PavilionsVenice Architecture Biennale - National Pavilions
ARCHITECT Magazine Video on The Korean Pavilion at 2014 Venice Biennale

12. 1ST PRIVATE EXHIBITION AT MINI WALL & WINDOW

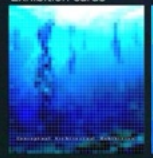
2009
Independent work
2 weeks
Graphic & Movie Clip

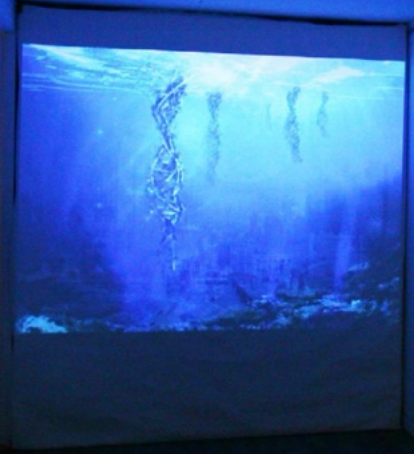
After the eVole skyscraper competition 2010, I compiled the competition materials in order to explain it to ordinary people. The exhibition consisted of graphics and movies, and it was displayed for two weeks in two spaces; in a Mini Window where graphics were exhibited; and in a Mini Wall where a movie was exhibited.

A movie was exhibited including process and final output

Interview

Exhibition cards





MW: Mini Wall Exhibition: Film and print exhibition

02. REVERSE EVOLUTION [AQUASCRAPER]

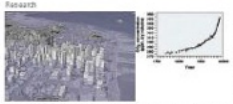
Date : 2009
Type : architectural competition
Role takes : Independent project (research, design, drawing, modeling, visualization)
Link

The earth under our feet is a living and evolving system that never stops changing and deforming. It is currently undergoing an interglacial epoch - a periodic phenomenon on the timescale of millions of years - and architecture must respond to the macro-scale cycles of atmospheric transformations. Reverse Evolution has accumulated human history and culture into a a new responsive mode of habitation. Civilization will continue to expand beneath the ocean's surface while maintaining its age-old urbanistic patterns that express ingrained human sociability.

Publication

Problem

Research



Most of current metropolitan cities are on plains located closer to the seaside which usually are at the latitude of 50~31 degrees. Rowing from glacial age to interglacial epoch, with all the carbon dioxide we have put out on the air, the water level soon will go up, and after all, the uncontrollable heavy force will devour all the metropolitan cities. The current depth of ocean floor formed along the coastline is about 49~50 meters. As the interglacial epoch evolves continuously, the estimated potential maximum sea-level would rise up to 80~82 meters. (US Geological Survey)

Concept & algorism

Diffusion-limited aggregation
mineral deposition, snowflake growth, lightning pathor living branch nature.

Diffusion is a random motion.
Although the motion of individual particles is totally random with respect to the direction, it may happen that particles walk somewhat far relative to a starting point.

The Reverse Evolution, going back to interglacial epoch, will take gradual steps to be firmly developed.

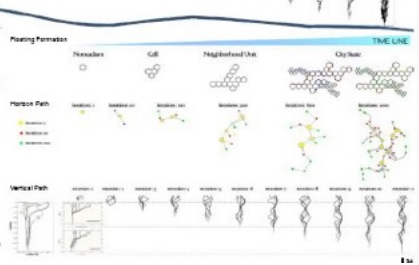
1.Nomadism. In fundamental family units, we will be roaming about above the sunken land.

2. Cell. Separate units gathering up to meet each of their needs.

3. Neighborhood Unit. Many different cells start grouping for the reconstruction of a town based on diffusion-limited aggregation theory(DLA).

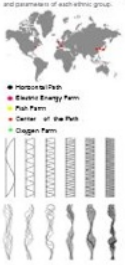
4. City State. Towns combined to correlate with one another will eventually be layering a well-defined cultural, technical and scientific city state under water rather than stacking up above being exposed to direct sunlight.

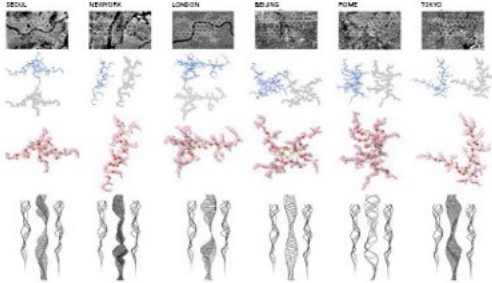
How can we accept and adapt to this natural principle? Based on this doubtful question, this project was seamingly planned to find the long-lasting alternative for us towards new history.



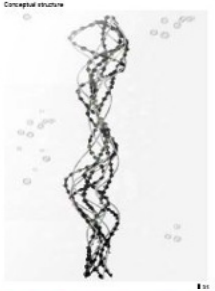
Site Strategy

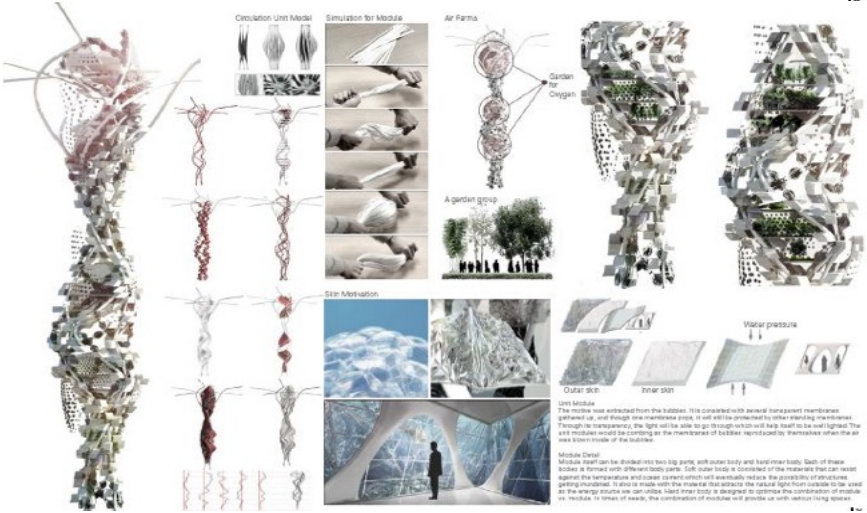
First the structure would gather up and be prosperous on the surface water. Then, in the process of stretching out, the formation should be uniquely generated by current cities' history, culture, identity, characteristics and parameters of each ethnic group.





Conceptual structure



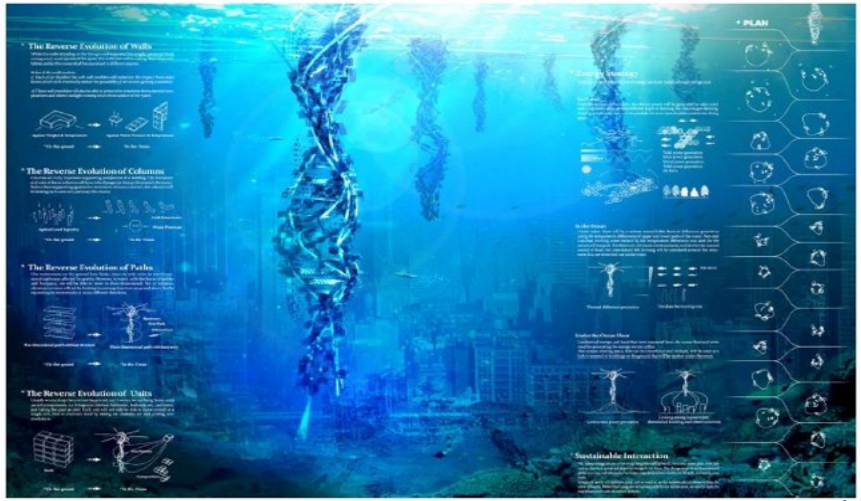


Unit Module

The module was extracted from the bubbles. It is consisted with several transparent membranes gathered up, and though one membrane pops, it will still be protected by other standing membranes. Through its transparency, the light will be able to go through which will help itself to be well lighted. The unit modules would be combing as the membranes of bubbles reproduced by themselves when the air was blown inside of the bubbles.

Module Detail

Module itself can be divided into two big parts; soft outer body and hard inner body. Each of these bodies is formed with different body parts. Soft outer body is consisted of the materials that can resist against the temperature and ocean current which will eventually reduce the possibility of structures getting inundated. It also is made with the material that attracts the natural light from outside to be used as the energy source we can utilize. Hard inner body is designed to optimize the combination of module vs. module. In times of needs, the combination of modules will provide us with various living spaces.



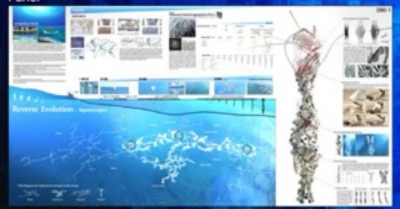
17. REVERSE EVOLUTION [AQUASCRAPER]

eVolo 2010 Skyscraper competition
2009
5 Months
Independent work

We, human beings, may have accelerated Global Warming by emitting too much carbon dioxide into the atmosphere, but the interglacial epoch is just one of many cycling activities of earth. No matter what, we have to get ready to adapt gradually to the changes the earth is taking. Though the earth has gotten crucially hurt over thousands of years by our thoughtless and selfish activities, we would never be able to leave the mother land where all our culture and history reside.

Publication

Panel



* The Reverse Evolution of Walls

While the walls standing on the firm ground supported the weight, protected from strong wind, and separated the space, the walls that will be taking those responsibilities under the ocean shall be rearranged in different aspects.

Roles of the wall module
a) Each of air bladder like soft wall modules will minimize the impact from outer forces which will eventually reduce the possibility of structures getting inundated.

a) These wall modules will also be able to protect the structures from extreme temperatures and direct sunlight coming down from surface of the water.

* The Reverse Evolution of Columns

Columns are very important supporting component of a building. The formation and roles of these columns will have to be changed as they go deep inside the ocean. Rather than supporting against the movement of ocean currents, the columns will be linking each unit and pathways like chains.

* The Reverse Evolution of Paths

Our movements on the ground have limits, since we only move in two-dimensional pathways affected by gravity. However, in water, with the forces of gravity and buoyancy, we will be able to move in three-dimensional. For an instance, elevators in water will not be limiting its moving directions to up and down, but be expanding its movements in many different directions.

* The Reverse Evolution of Units

Usually we stack up the units on the ground, but in water, we can hang. Some units are job components, i.e. livingroom, kitchen, bathroom, bedroom, etc., and some, just taking the part as joint. Each unit will not only be able to move around as a single unit, but to maintain itself by taking old modules out and putting new modules in.

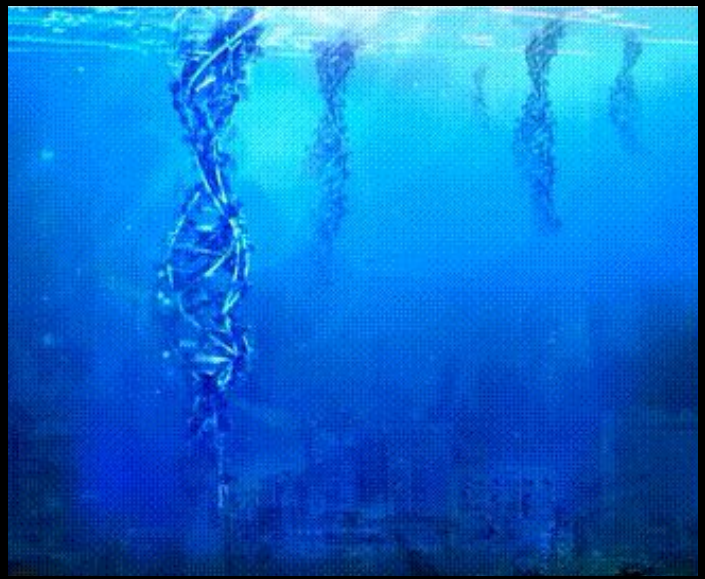
- In the Ocean

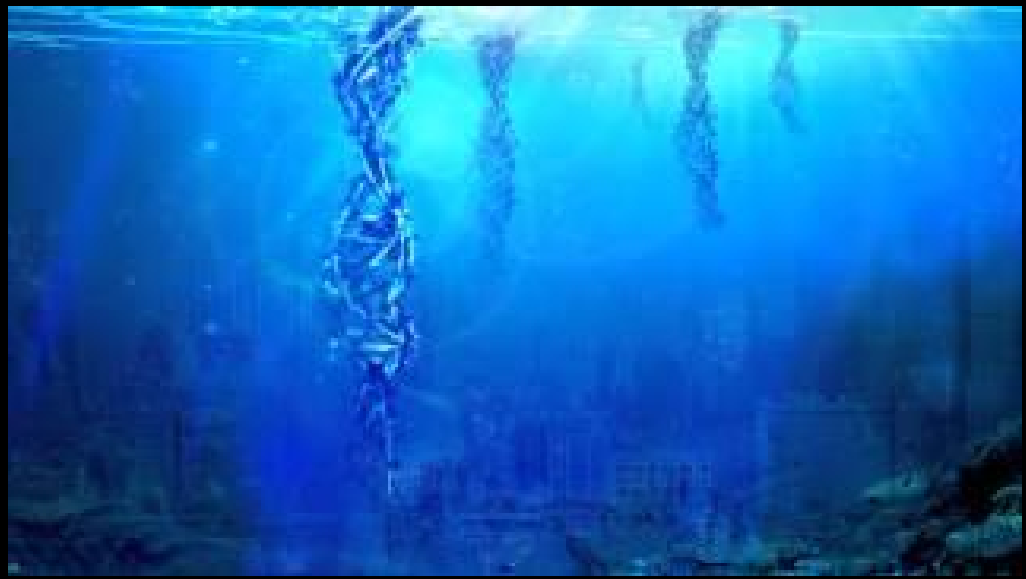
Under water, there will be a serious research like thermal difference generation using the temperature differences of upper and lower parts of the ocean. Not only was that, swirling water created by the temperature differences was used for the means of transport. Furthermore, for visual entertainment, and also for the natural source of food, the customized fish farming will be simulated around the structures that are stretched out under water.

* PLAN

AQUASCRAPER Exhibition 2010

At MW(Mini Wide; Mini Wall), www.miniwide.com, Seoul, South Korea



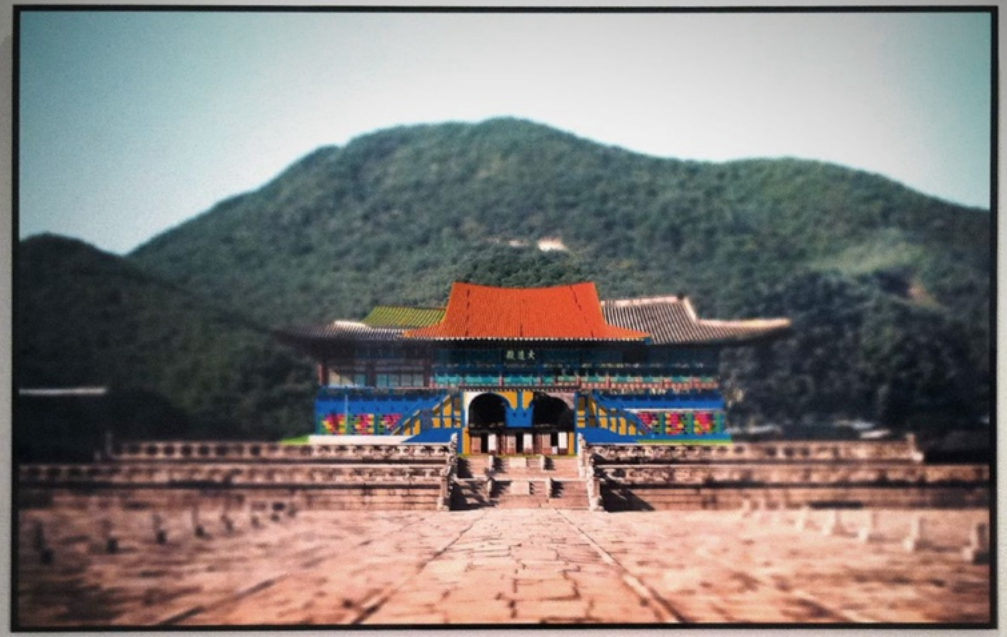


https://namjulee.github.io/njs-lab-public/work?id=2010-evolo-skyscraper-exhibition

11. KOREAN TRADITIONAL HOUSE, ARCHITECTURAL COLLAGE [EXHIBITION]

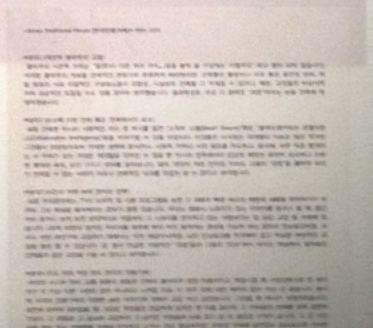
2010
Independent work
An artist
2 Months
Print & Movie Clip

This is a visualization work submitted to an architectural exhibition, which was inspired by a traditional Korean building. By digitally reconstructing the building process and overlapping it to the actual context, this work suggests reminders to visitors regarding laborious construction endeavors, beyond the state where they passively appreciate architectural externals.

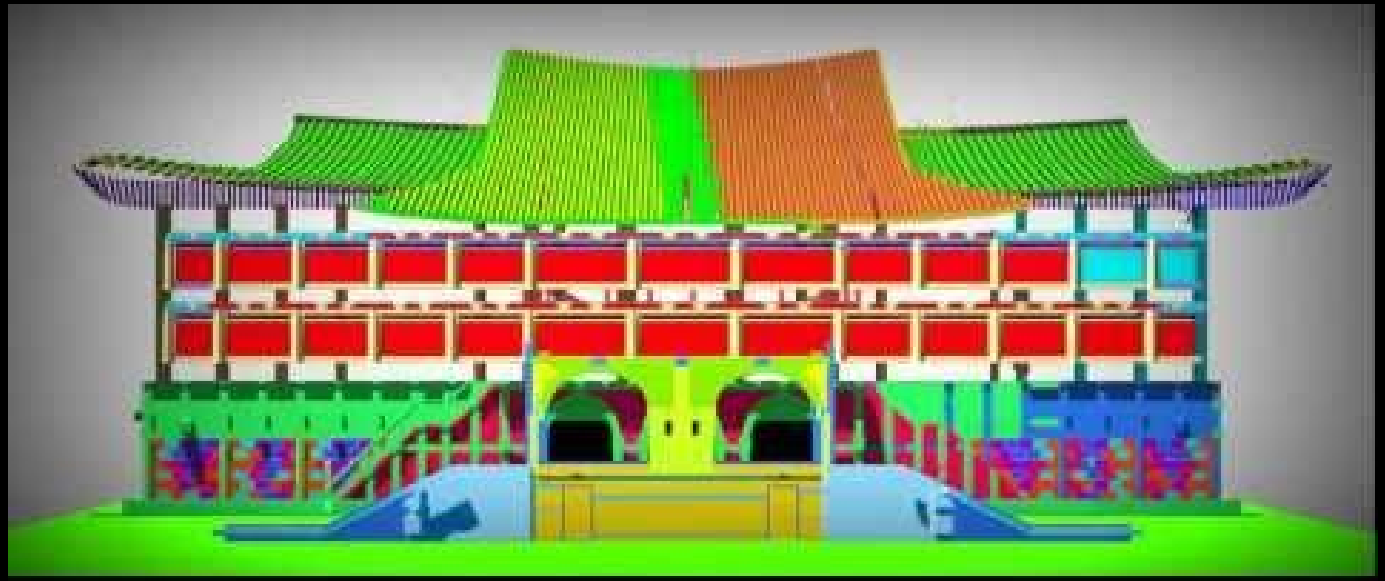


Publication

Opening



Sequence of Movie Clip



https://namjulee.github.io/njs-lab-public/work?id=2010-korean-traditional-house

14. TRANSITION
[DIGITAL FILM EXHIBITION]

Date : 2009
Independent work
A media artist

An intentional space [Perception Series Work]
As a director
2 Months

Content: An experiment on how to perceive the interaction between a light and a surface

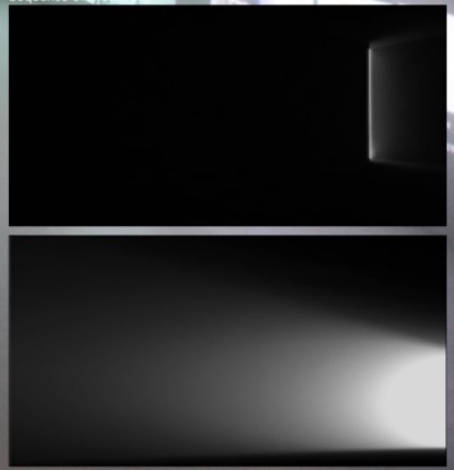
In fact, of the five senses including sight, hearing, touch, smell, and taste, humans are able to perceive a space and a surface depending mostly on the sight. In other words, these spaces and surfaces I made for this exhibition could be expressed or materialized by light. Surfaces created by the light are stored as information into our brain consecutively, and based on that assumption; an afterimage phenomenon on our brain could generate space having time lines.

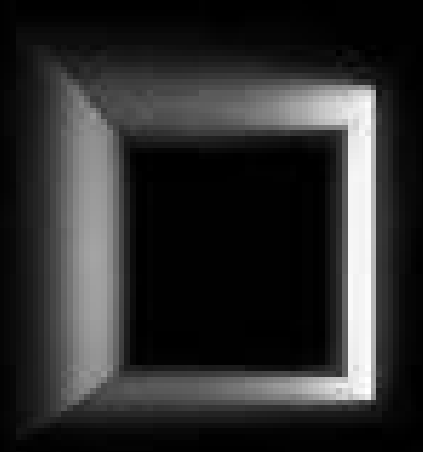
Pictures

Interviews

Sequence of Movie Clip

Sequence of Movie Clip





https://namjulee.github.io/njs-lab-public/work?id=2009-intended-space

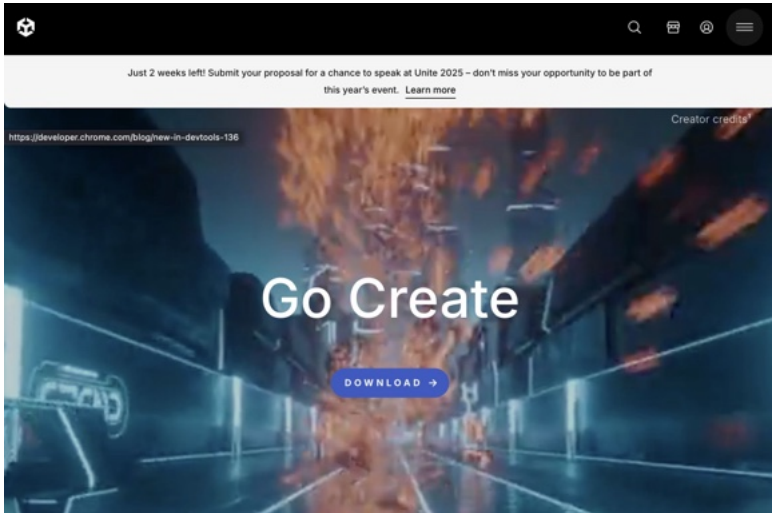
DESIGN VISUALIZATION

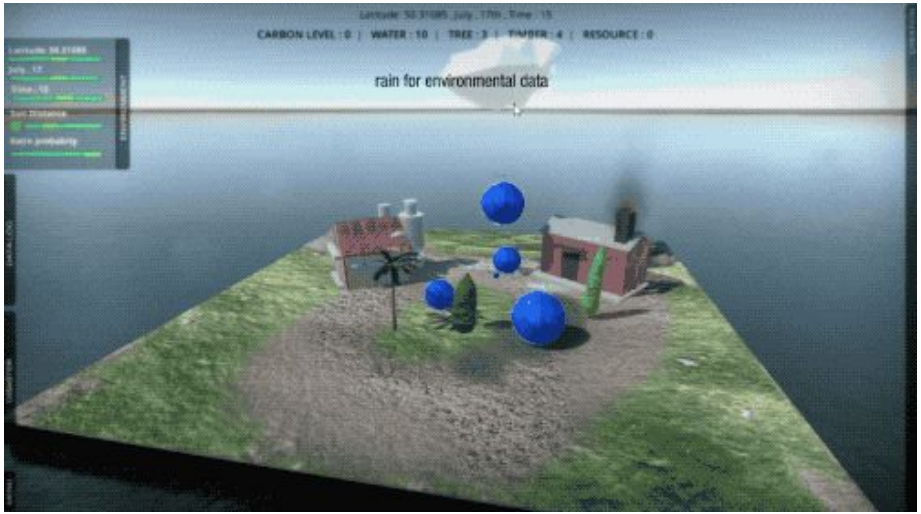
Immersive experience

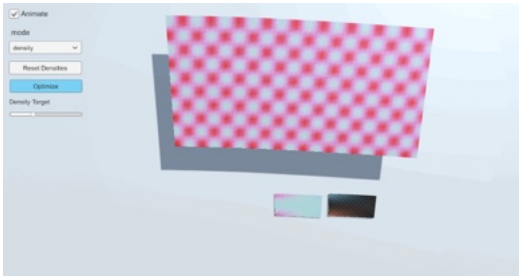
VR, AR, MR Development

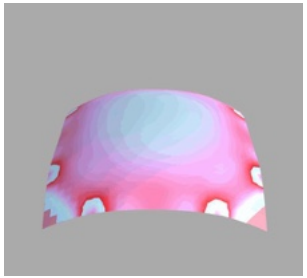
Unity

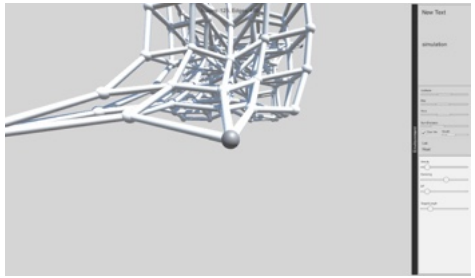
https://unity.com/

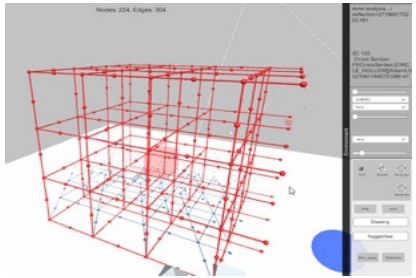




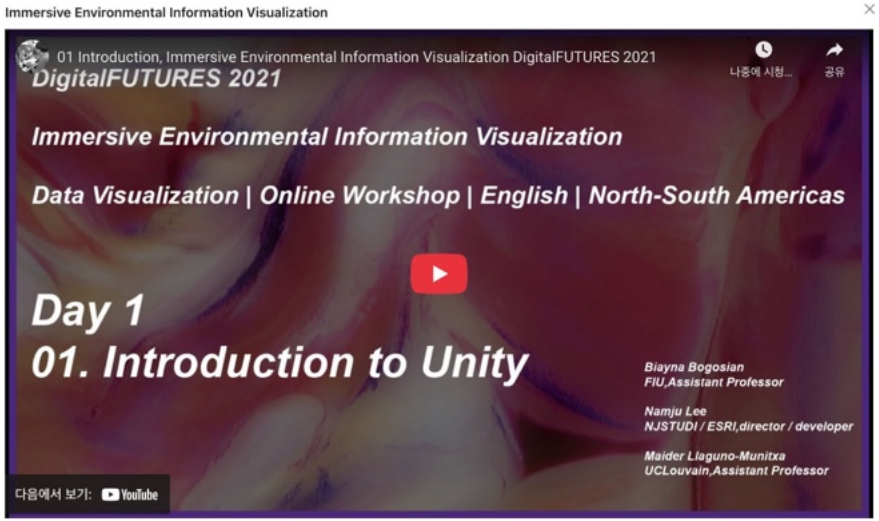








Immersive Environmental Information Visualization



Immersive Environmental Information Visualization -
https://namjulee.github.io/njs-lab-public/work?id=2021-immersive-environmental-information-visualization

Git: https://github.com/NamjuLee/DigitalFUTURES-Immersive-Environmental-Information-Visualization

Medium:
https://nj-namju.medium.com/immersive-environmental-information-visualization-technical-docs-8e10a64e83c7

0 Introduction

1 Interface

- UI
- View Control

2 Component

Introduction to Component Based Architecture in Games—link

- Parameter -Diagram
- AttachComponent
- Transform
- Instantiate & Destroy
- Debug & Gizmo & Visualization

3 Interaction

- Mouse event—link
- Raycast—link
- Picking & Regidbody—link
- Collision—link
- Keyboard Event—link
- Keyboard and Collision—link

4 UI

- UIBasic—link
- UIEvent— link
- UIImage— link

5 Data *Data Format and structure:* Difference between Structured, Semi-structured and Unstructured data—link
Unstructured data
Structured data- CSV
Semi-structured data- JSON, GeoJSON
Image: Remote Sensing, DEM,

- Import CSV file—link
- Import CSV by URL—link
- Import JSON by URL—link
- Rest API—link
- Import OBJ—link
- Import Image—link

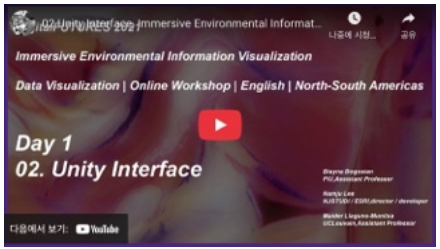
7 Mesh

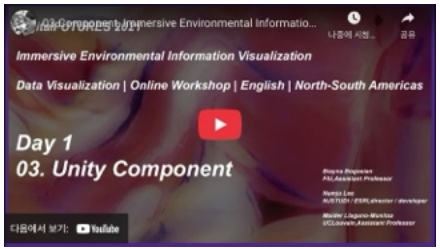
- Mesh Basic—link
- ProcedualCubeMesh—link
- Mesh(Bunny) from OBJ— link

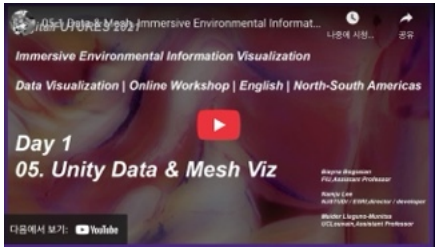
8 Scene Examples

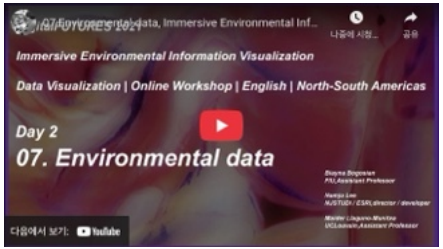
- GeoJson and Visualization—link

Immersive Environmental Information Visualization









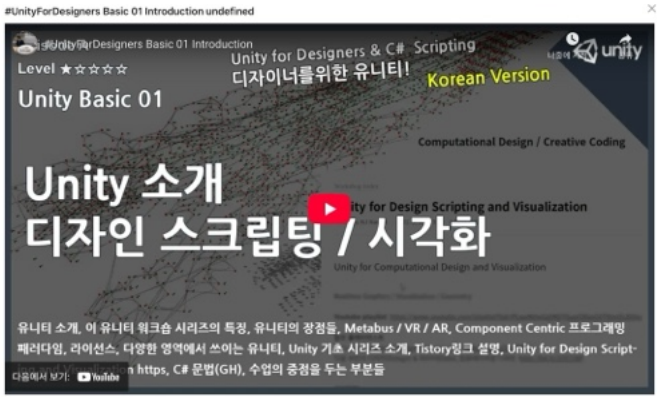
Unity for Design Scripting and Visualization

Unity for Computational Design and Visualization

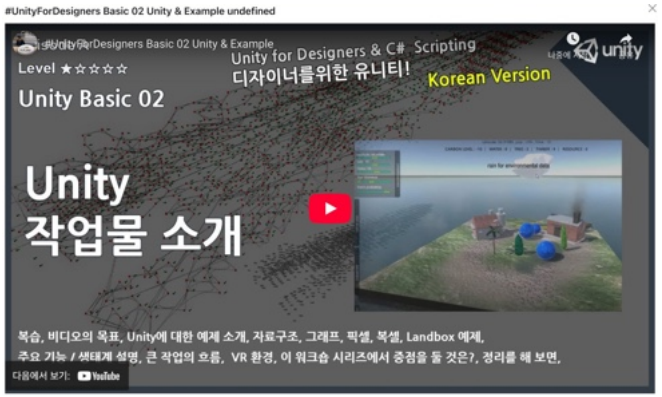
Unity for Designers - link

Realtime Graphics / Visualization / Geometry

Youtube playlist:
https://www.youtube.com/playlist?list=PLweNVwGgDKEYSupf2flzpZdT8tmSL8SNo

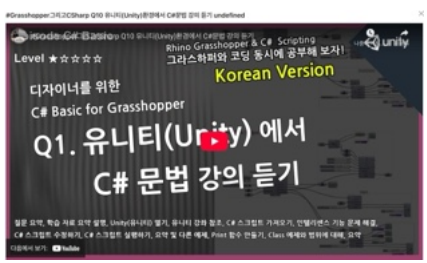


UnityForDesigners Basic 01 Introduction -
https://namjulee.github.io/njs-lab-public/lecture?id=IbCWtsyacBo

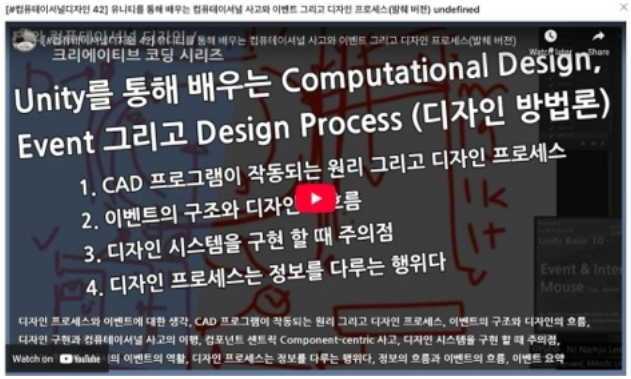


UnityForDesigners Basic 02 Unity & Example -
https://namjulee.github.io/njs-lab-public/lecture?id=qZU0HX6I_Y8

UnityForDesigners Basic 03 Unity 실행 그리고 Interface -
https://namjulee.github.io/njs-lab-public/lecture?id=40znXhhOw-w



Grasshopper그리고CSharp Q10 유니티(Unity)환경에서 C#문법 강의 듣기 -
https://namjulee.github.io/njs-lab-public/lecture?id=tGBvcZiJv8s



컴퓨테이셔널디자인 42] 유니티를 통해 배우는 컴퓨테이셔널 사고와 이벤트 그리고 디자인 프로세스(발췌 버전) -
https://namjulee.github.io/njs-lab-public/lecture?id=1oxR8G51TjQ

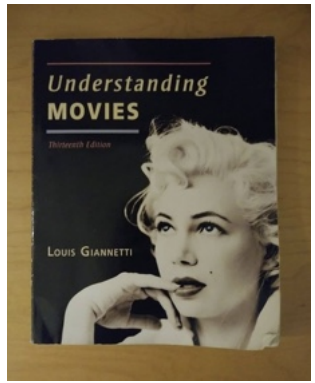
Reference

Animation & Simulation for Architectrual presentation

Author

2008
DigitalBooks
512 Pages

https://namjulee.github.io/njs-lab-public/writing

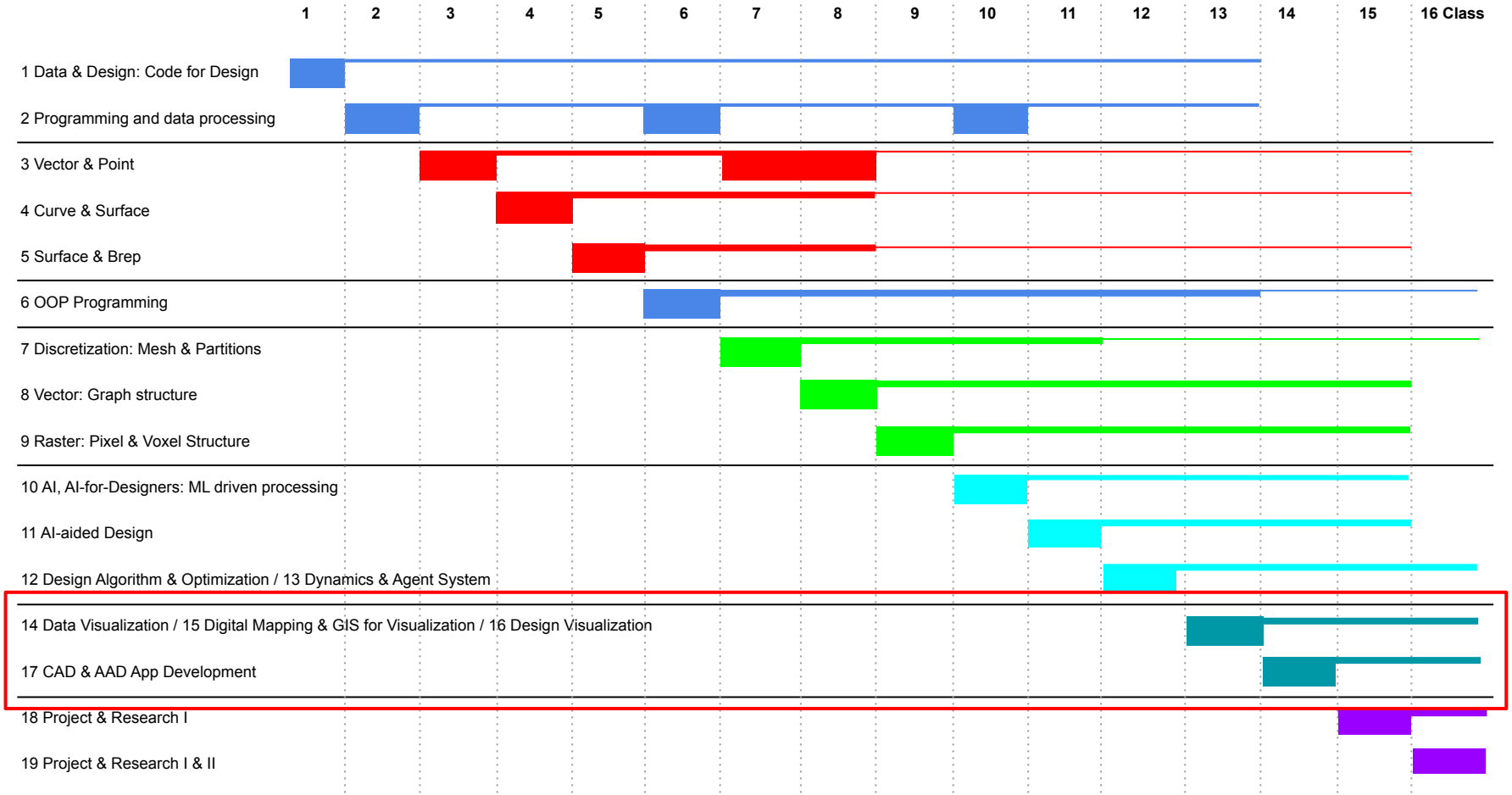


Understanding movies

Louis Giannetti

컴퓨테이셔널디자인 10] 건축 시각화 / Architectural Visualization -
https://namjulee.github.io/njs-lab-public/lecture?id=6Z_5oAElfa8

DATA IN DESIGN 2025



PechaKucha

- 20 slides for 40 seconds per slide (15 min)
- Discussion for 10~15 min
- Images, Gifs, Video…
- Contents

(1) Abstract(초록)
A concise summary (200–300 words) covering the research objective, methods, results, and conclusions.

(2) Introduction(서론)
Background, significance, limitations of previous studies, and an overview of your research goal and approach.

(3) Literature Review(이론적 배경)
Analysis of existing research and explanation of how your study contributes to the field.

(4) Methodology(연구 방법)
Description of experimental design, data collection, and analytical tools used.

(5) Results(결과)
Presentation of research findings, often with visualizations like tables or graphs.

(6) Discussion(논의)
Interpretation of results, comparison with previous research, implications, and study limitations.

(7) Conclusion(결론)
Summary of key findings, contributions, and potential future research directions.

(8) References(참고문헌)
Cite sources following the required academic style (APA, MLA, Chicago, etc.).

Retrospective session

fine-tune

Thank you :)

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Brunch: https://brunch.co.kr/@njnamju

linkedin: https://www.linkedin.com/in/nj-namju-lee-926b3252/

fb: https://www.facebook.com/NJ.namju.lee

instagram: https://www.instagram.com/nj.namju/

Youtube:

Eng: https://www.youtube.com/@NJNamjuLee

Kor: https://www.youtube.com/@CodeforDesign

Apple podcast link:

Eng: https://podcasts.apple.com/kr/podcast/njs-computation-for-design/id1812364089

Kor: https://podcasts.apple.com/kr/podcast/njs-computation-for-design-남주의-디자인-컴퓨테이션/id1812364362

Spotify

Kor: https://open.spotify.com/show/2WHlhPDcBzRUMyH6W8fdI7

Eng: https://open.spotify.com/show/75vz1sJCJqy93F56DuPgwc