Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan

Personal information	
Name	Ho Yuan Yang
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Studio		
Name / Theme	Complex Projects	
Main mentor	Henri van Bennekom	Architecture
Second mentor	Yang Zhang	Architecture
Argumentation of choice of the studio	The choice for the chair of Complex Projects is mainly driven by my interest in exploring the potential of an architectural design that situate in a Metropolitan city. The formation of the compact and saturated built environment of Metropolis is driven by various concerns in the field of history, technology and economy, which provides a diverse contextual background for innovation. I am intrigued by the dimension of the studio and its organized framework which enable me to explore a design through comprehensive research on different scales of the city.	

Graduation project	
Title of the graduation project	Datacentric Common
Goal	
Location:	Midtown Manhattan
The posed problem,	Along with the growing amount of data usage and smart city development ambition of the New York City, more data centers are expected to be built in the urban area to meet the demand of even higher connectivity and lower latency brought up by the advance technology and relocation of business center. Data centers have long been an infrastructural typology that prioritize functionality over humanity. Urbanization of data centers means more urban space will be taken up by data centers that are designed purely for servers, which harms our livability. As data usage is growing exponentially every year, it is imperative to design a way that situate data centers more harmoniously into the city fabric that bring positive impact to its surrounding people and the environment.
research questions and	Seeing urbanization of data center as a future trend, how could data center situate in midtown Manhattan that bring extra values to the people and the urban environment?
design assignment in which these result.	The design is located at Northeast midtown Manhattan, where big companies are moving out and tech startups is coming into the area to establish a new business center. The design will focus on how data center could facilitate the vision of the city to retain its status of world-class business center in midtown and at the same time cater the need of the local community. The design will be an integrated complex with gross floor area at least 50 000m² which incorporates function of a data center, office and recreational center. The design aims to position data centers in midtown Manhattan as anchors of smart city developments and harnesses its waste energy to empower social gathering places and creative work environment.

Process

Method description

Urban analysis and typological study will be the major methods for research and design. Mappings are created from the hard data collected from the government open database, such as land use, land value, demographics and mobility network, which provide a solid and rational foundation to acknowledge the site. With first-hand information gathered from field trip and literature reviewed on New York City development, the site is analyzed through different levels from the city scale to street and building scale, which include also study in the dimension of time from the past to future.

Typological studies involve the study of existing buildings in the site and data center typology. The formation of building types will be investigated to deduce the factors which determine the building design, which provides basis to foresee the future development.

The design methods will be based on theoretical and practical literature and case studies which give reference to specific spatial and structural requirement of the proposed building functions. Physical and digital modeling, sketching and making collage will be the major methods to develop a design.

Time planning

The graduation project review consists of 5 parts (P1-P5).

p1:
- Mapping of hard data, site model.
- Developing personal interest and research question.
- Seminar article of research methodology.

p2:
- Group vision, site movie, drafted research book.
- Presentation of research topic, design ambition, location and programmatic choice.
- Proposal for future design direction.
- Seminar article of New Urban Question.

p3
- Concept design, zoning refinement, massing
- Design: spatial/material design, model making, plan and section

p4
- Detail development, Visualisations

p5
- Final design, full presentation

Literature and general practical preference

Busquets, J., Katsikis, N., & Harvard University. Graduate School of Design. (2017). Manhattan : Rectangular grid for ordering an island (Harvard graduate school of design studio research project). Hong Kong: Applied Research And Design Publishing.

Geng, H. (2015). Data center handbook. Hoboken, New Jersey: John Wiley & Sons. (2015)

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Holl, S., Pallasmaa, J., Pérez, G.A. (2006). Questions of Perception: Phenomenology of Architecture. San Francisco, CA: William Stout.

Husserl, E., & Findlay, J. N. (1970). Logical investigations.

Nash, E., & Willis, C. (2005). Manhattan skyscrapers (Rev. ed.). New York: Princeton Architectural Press.

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Wolfe, G. (1975). New york, a guide to the metropolis : Walking tours of architecture and history. New York: New York University Press.

Reflection

My graduation project and investigation into a new data center typology is highly relevant to the global trend as we are stepping into the information era and depend even more on data. Along with smart city development, new advanced technology such as 5G connectivity, automation keep emerging to improve quality of our lives. It leads to a tremendous shift in social behaviour and the urban landscape within few years. Despite the data-hoarding culture, people's awareness on the enormous energy use and social impact of data center remains low.

Largely ignored in traditional architectural discourse, data center is a building type which designs based on utilitarian requirement and optimal efficiency for machines. As it used to be located in deserted suburban area, its socio-environmental impact to the its surrounding neighbourhoods is not always taken into account in its design. As urbanization of data center will be a future trend to support smart city development, my project becomes essential to put data center into architectural discourse and rethink the way how it could be introduced to the city in a more human-oriented way.

The project is also highly relevant to midtown Manhattan as focused topic of the studio, provided that the New York City is the pioneer of smart city development. The project focused on the relocation of business center in Manhattan and foresee the moving in of small startups who support the construction of the smart city, as propelled by the new rezoning plan of the city announced in 2017. My research and design takes this specific site context into account and provide integrated proposal that support the city's development ambition.