Week 4

Theory, concepts and models: *reflections and further directions*

This week we will map out our current understanding based on learners' forum posts and set foot to relevant theories, concepts and models.

Photo by Tandem X Visuals on Unsplash

Outline

01

Week-by-week reflections

Week 1 to week 3

02

Establishing current understanding

Based on the submitted week-to-week reflections

03

Theories, concepts and models

Oxman and Oxman (2014)

Photo by Muhd Asyraaf on Unsplash

Aims and objectives

- To infer what students have learnt during the first three weeks
- To exhibit reflective practice mid acquiring knowledge
- To elicit current understanding based on the forum posts
- To relate the current understanding with relevant theories, concepts and models.

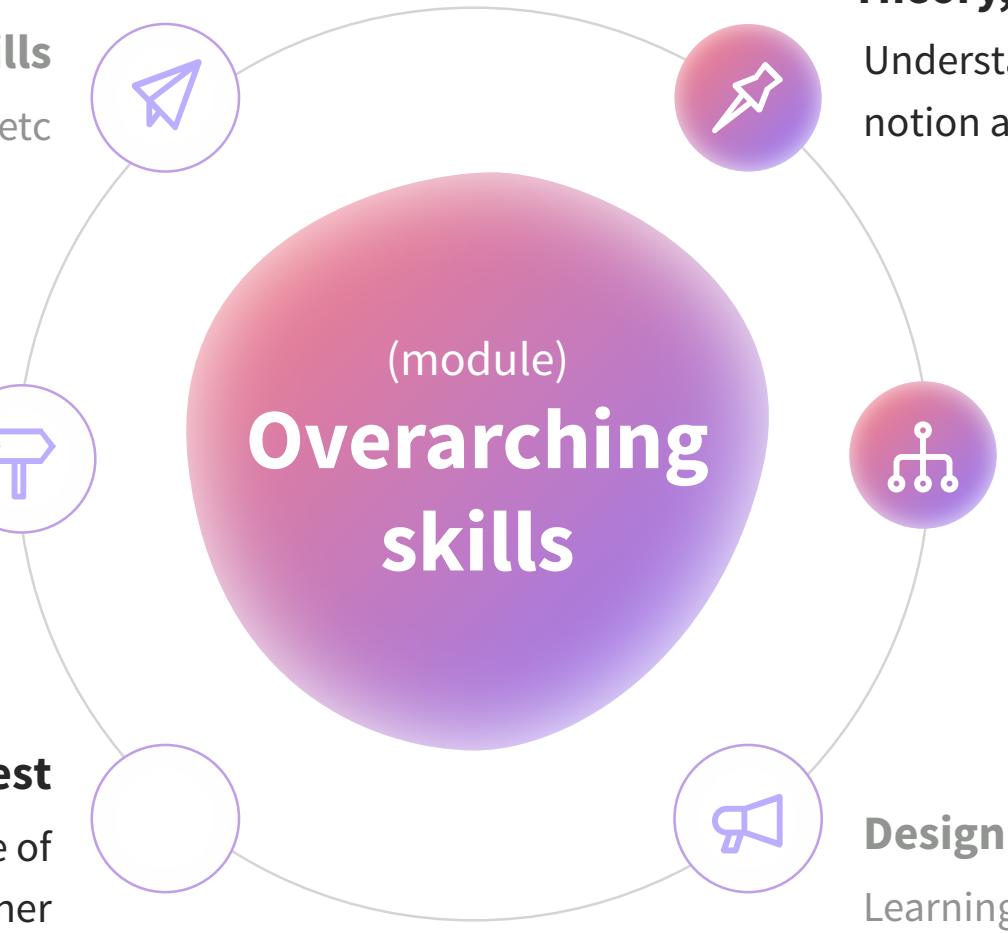
Learning outcomes

Students will be able to..

01 Describe their **current understanding** in relation to digital architecture.

02 Enumerate important **theories, concepts and models.**

03 Formulate **understanding** of the theories, concepts and models.



Software skills

Rhino, Grasshopper, etc

Theory, history and current debate

Understand historical background of this notion and relevant debates.

Research skills

Designing through extensive research

Important concepts

Digital fabrication and construction
Digital design cognition
Human-computer interaction
Digital craftmanship
etc

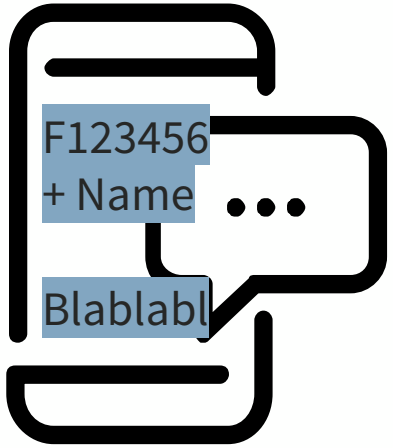
Personal interest

Exploring a preferred scope of design to be developed further

Design precedents

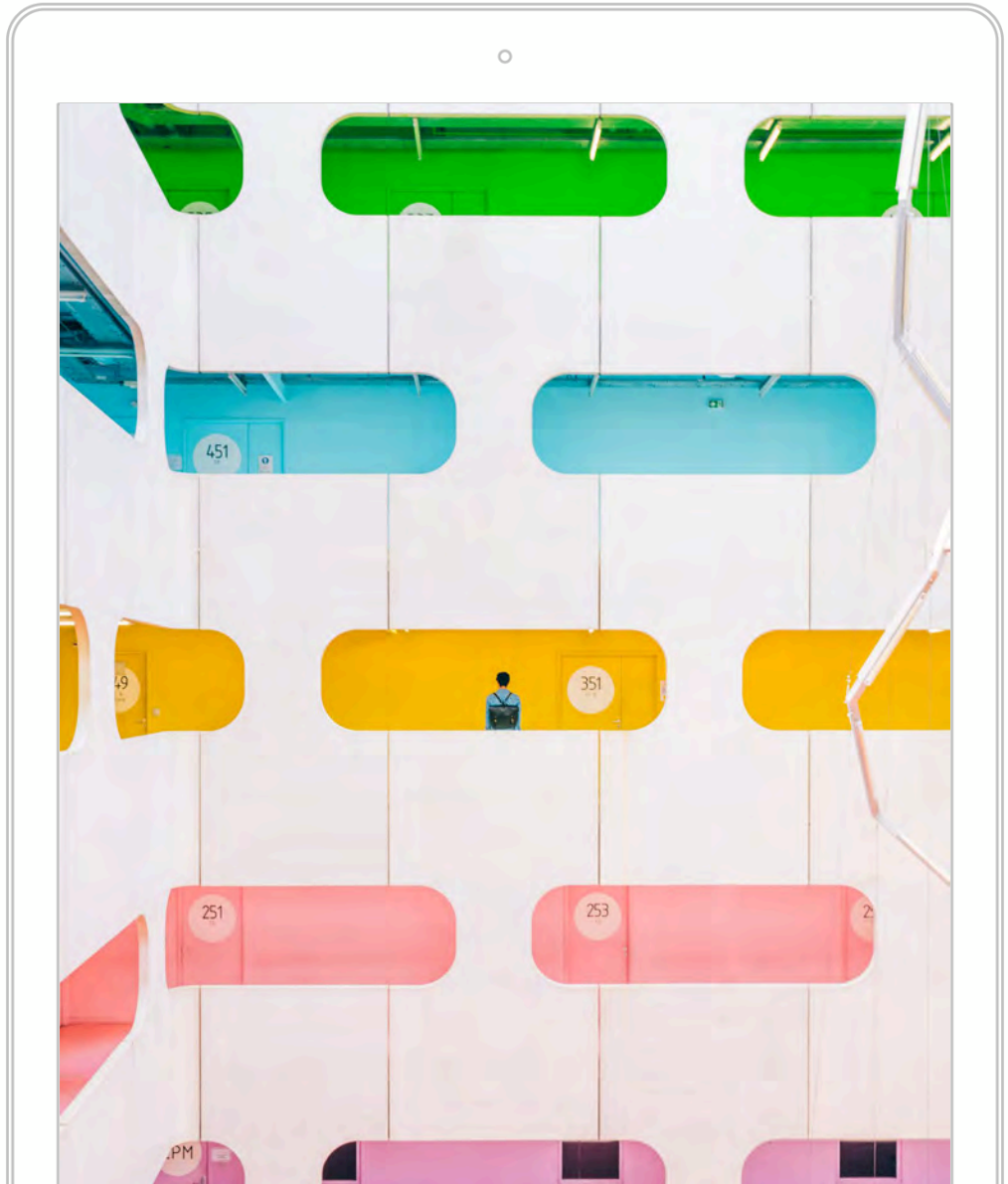
Learning through analysis of completed project

Discussion



Make a short summary of one chosen topic:
See instruction on the link below

https://miatedjosaputro.com/2020/03/17/week-4-discussion/



WEEK 1

IMPORTANT NOTIONS TO VIEW THE FIELD

WEEK 2

HISTORICAL BACKGROUND

WEEK 3

ACADEMIA AND INDUSTRY DIALOGUE

Photo by Victor Lam on Unsplash

WEEK 1

IMPORTANT NOTIONS TO VIEW THE FIELD

What are major changes in terms of the way architects think, make and design?

How did the relational value between design tools and designers shift?

What did you know about digital architecture which previously you didn't know?

https://miatedjosaputro.com/2020/02/25/week-1-about-module/

Week 1: your thoughts

Major changes

- The improved **accuracy**
- The improved **precision**
- The improved **efficiency**
- Doing what **previously unable** to do without using software
- Improving **communication with clients**
- **Delimiting** architects
- Better **story tellers**, better communicators
- **More to come** in next few years..
- Ability to **support complex shapes**
- The shift of our **understanding of the world**
- Changing the way **people relate** to a place
- **New material's** exploration
- **Virtual toolbox**

Shift on relational value

- **Time** factor (quick design)
- Equipping architects to **refine ideas** through technology
- **Alternative option** if you are not good at sketching
- **Simplifying** the act of **producing drawings**
- **Multimodal** information processing
- Help on **expressing design**

Previously was not aware

- **Coding and gaming**, more tools beside AutoCAD and Sketch Up
- The **digital design ecosystem**

WEEK 2

HISTORICAL BACKGROUNF

D1. Putting your utopian thinking hat, how do you envisage your own version of futuristic built environment? You can also upload a quick sketch.

https://miatedjosaputro.com/2020/03/04/week-2-discussion-1/

D2. How can digital tools enable architects and designers to create better architecture for more people?

https://miatedjosaputro.com/2020/03/04/week-2-discussion-2/

Week 2: your thoughts

D1. Futuristic built environment

- Intellectual tools that bring many innovations as a **holistic approach**
- Faultless **public transport,** autonomous vehicles continue
- **Smart building** as in constantly gathering data from occupants and visitors
- Intelligent **high street**, for example dominated by augmented reality and interactive dressing rooms
- Buildings based on **scientific knowledge**
- Tech and innovation that make our lives **simple and efficient**, reducing impact on **environment**
- Future with more **environmentally friendly** strategies
- Regaining its lost aesthetic related to **natural elements**
- Cities **without cars**
- Architecture work that **grows**
- Improved **site analysis** etc
- More **symbiotic relationship** between **nature and human being**
- **Structures** in the **sky**
- Advancement in building tech related to **environment**
- **AI** for more sustainable and environmentally friendly cities
- **Biomimetic** buildings
- Buildings which can **enable healthier lifestyle and greater community cohesion**

Week 2: your thoughts

D2. Digital tools and better architecture

- More realistic **visual rendering**
- Improving **decision-making** process
- Provision of **more efficient buildings** in terms of **structural** solutions
- More **environmentally** efficient buildings (maximise natural ventilation, solar access, shade)
- Manifestation of design in **short period of time**, leads back to efficiency
- **Productivity and creativity** (better on expressing and showcasing ideas) in **no limit**
- Putting **architect's vision** and **creativity** to work
- **Efficiency** and **speed**
- **Correction** in real time and is made **easier**
- **Move freely** in architectural space
- **Material** change/ selection in real life
- Accessing **digital information** in our daily lives
- **Simulations** before design is built (design performance, durability, sustainability, able to foresee the outcome of design)
- **Shifting architects' focus** rather than thinking about trivial matters
- Changed the way **we experience built environment**
- **New systems** where architectural processes can emerge through **close collaboration** (between human and machine)
- Provide architects with **wider** point of **perspective** and **more design options** (Generative Design)
- Adding new dimension to architectural product, **materialise ideas that are not fully expressed**
- **Catalyst** in design
- Social connectivity with **clients** (files can be sent on multimedia messages in short period of time)
- Learning opportunities through **online research**
- **Automation**
- Designing become **fun** and **effective**
- **Flexibility** on **working arrangements**

WEEK 3

ACADEMIA AND INDUSTRY DIALOGUE

The Armadillo Vault project:

How does dialectics between academia and industry exhibited in this project?

How did the conversation between academia and industry in design stages contribute to advancement of the project (and design field)?

https://miatedjosaputro.com/2020/03/10/week-3-discussion/

Week 3: your thoughts

Dialectics between academia and industry

- **Symbiotic**
- Relationship between **geometry and forces**
- **True structure**
- Material and fabrication are not equal to limited design possibilities, instead **starting point**
- Geometry + structure + material combination
- **Dialectics** of: **constrained structure** in specific **form and functionality** + understanding of **geometry** + **digital tools** + **experienced crafts** on **local materials**
- **Brain** (academia) and **body** (industry) analogy
- Efficient way to work with **less room for error**
- Buildings can be constructed more efficiently using **sustainable materials**
- Structural and material constraints can be used as **driving force** to create amazing architecture
- Effectively converting a **'perfect world'** of digital design into **'real world'** fabrication and construction processes
- **Fabrication of complex design** is made possible by computational tools
- Knowledge from academia **converge** at the architectural **focal point**
- Renounce **balance of computation** and **traditional craft**
- **Pushing design further** in terms of creativity

What kind of understanding have we established?

With regards to digital architecture

The understanding

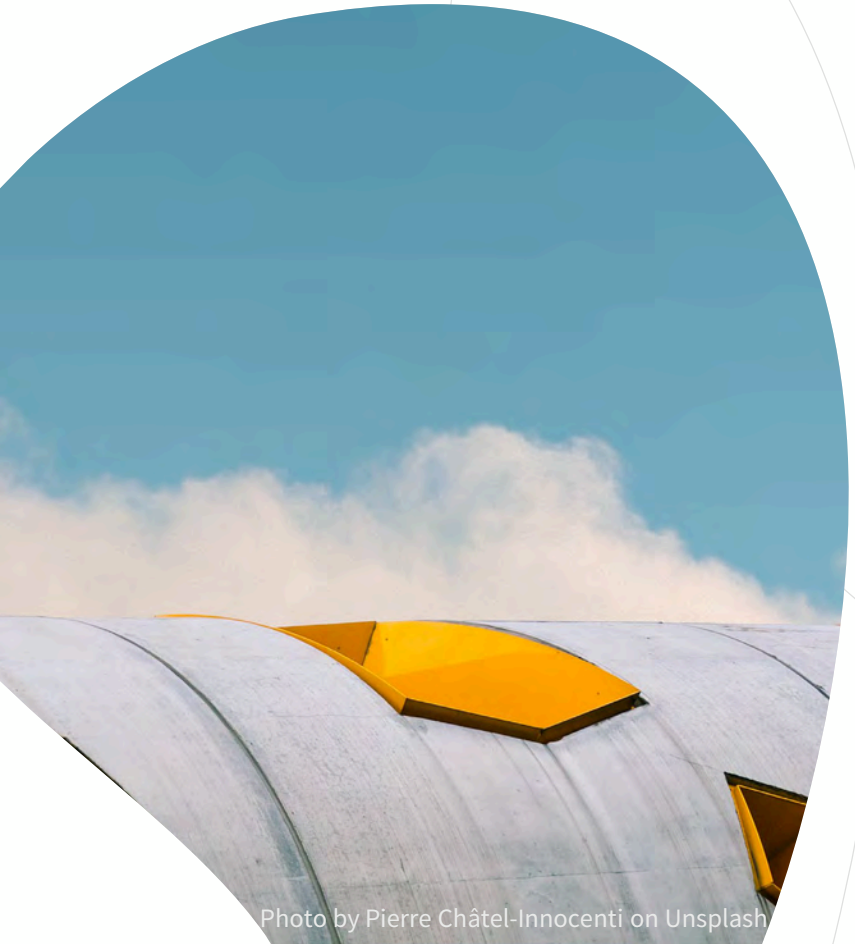


Photo by Pierre Châtel-Innocenti on Unsplash

Think-draw-make

Changes on the way architects think-draw-make in computational design have presented benefits to design stake holders (clients, collaborators and public) and improve quality of built environment. Architecture practices are also shifted.

Digital design pedagogy

Comprehensive understanding of digital design as learners develop digital literacy is important. In their five years of digital studio reflection, Ikeda et al. (2016) posit five factors design skills can be exercised.

Ikeda, Y., Toyoda, K. & Takenaka, T. (2016). The Pedagogical Meanings of an Experimental Full-Size Mock-Up of Computational Design.

New possibilities

Creativity is pushed further with the help of computational design tools, which addressed critiques that they hinder creativity. Strategies to address environmental issues are also in the main agenda of this emergent way of designing.

Digital design ecosystem

Design process is moving away from being linear and architects are at the centre of this ecosystem. Collaboration with specialists in industry, academia, local craftsman and end users provide more meaningful design.

Our utopian thinking also suggest that more advancement is yet to come. Better systems to tackle environmental problems.

We have seen..

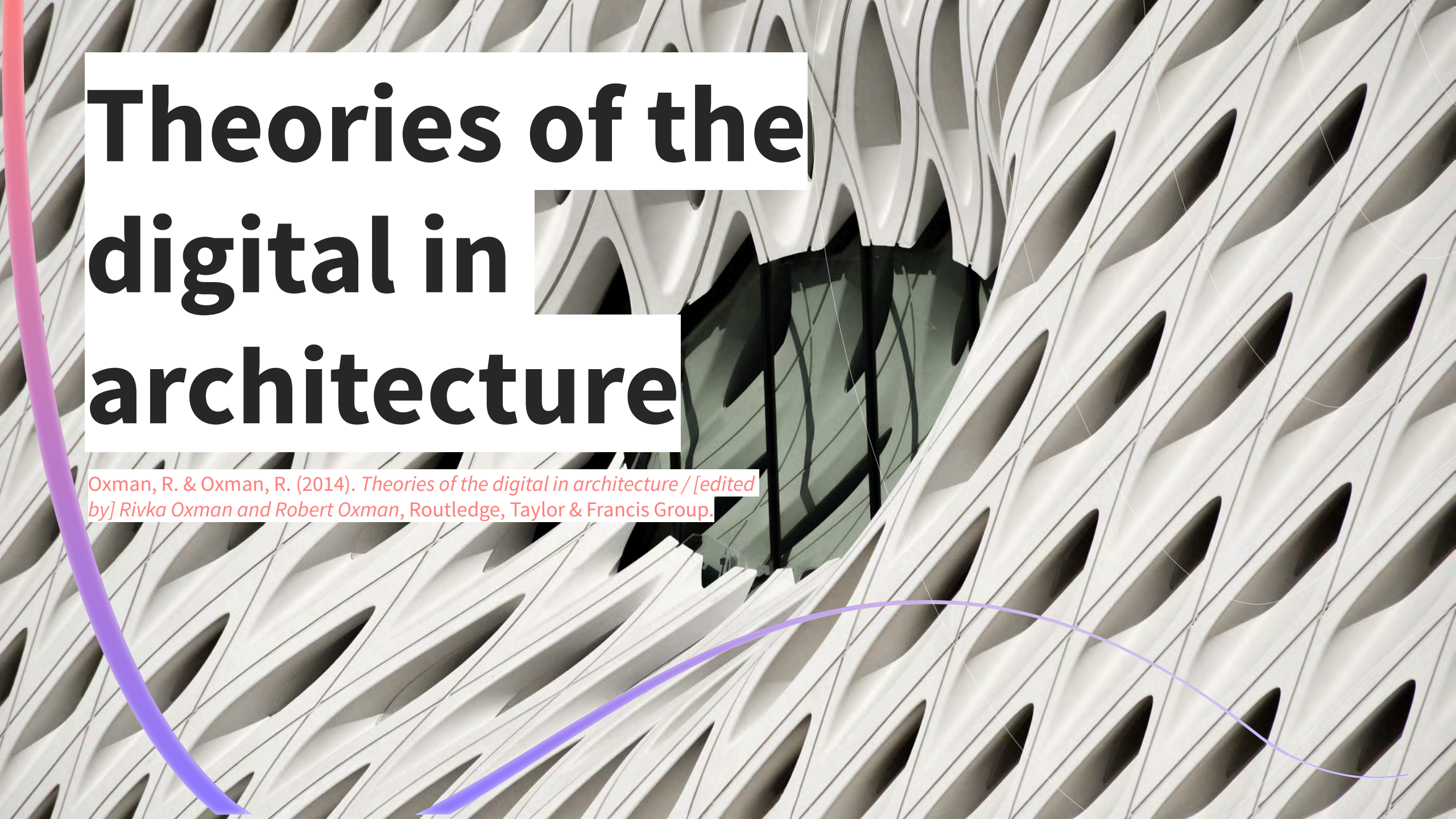
01 How the area of computational design can be viewed using theoretical lenses

02 Historically how prominent architects harnessed technology

03 The pertinent need to collaborate

04 And.. Built our common understanding about the field

Theories of the digital in architecture



Oxman, R. & Oxman, R. (2014). *Theories of the digital in architecture / [edited by] Rivka Oxman and Robert Oxman*, Routledge, Taylor & Francis Group.