Digital Architecture:
Concerns in pedagogical approach

29 February 2020

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Digital Architecture?

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Outline

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INTRODUCTION
Aims
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DIGITAL TURNS

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JIGSAW
READING
3 GROUPS

4
QUIZ AND
PEER
EVALUATION

Aims and objectives

- To elicit students' current level of knowledge about digital architecture through brainstorming
- To introduce students to digital turns in architecture
- To introduce important concepts concerning architecture pedagogy in response to the digital turns

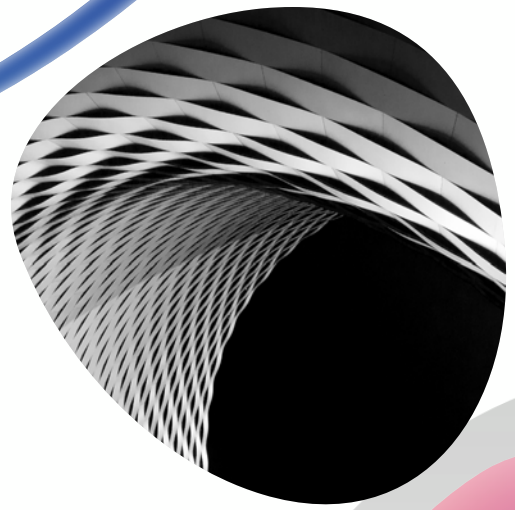
Learning outcomes

Students will be able to..

01 Comprehend digital turns in architecture

02 Name the three concerns related to digital architecture pedagogical approach

03 Discuss based on their background knowledge and short input text



Formative assessment:

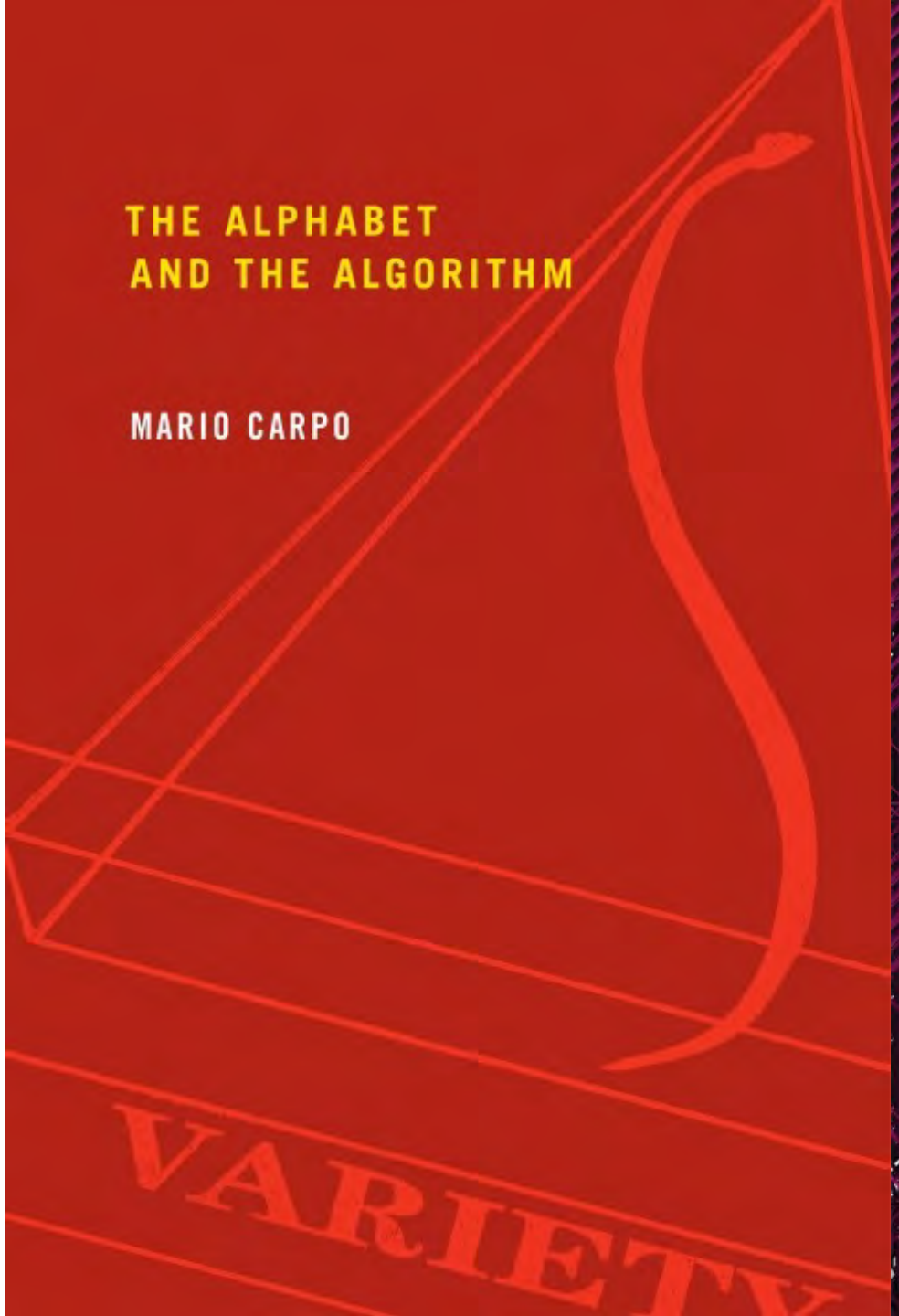
In forms of quiz and peer evaluation

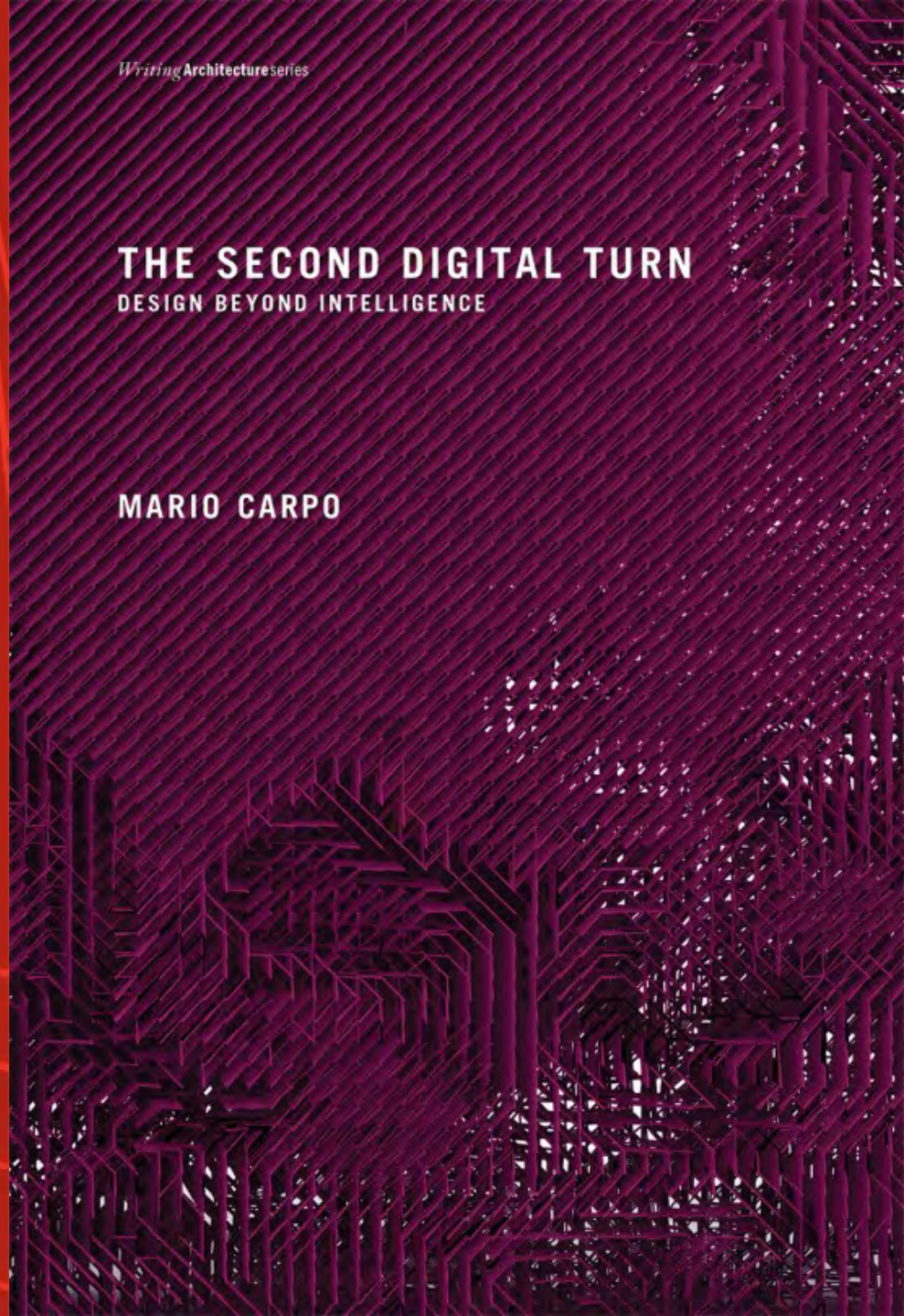
4
PEER
EVALUATION

LO-01 Digital turns

LO-02 Three concerns

LO-03 Discussion





Carpo, M. 2011. The alphabet and the algorithm, MIT Press.
Carpo, M. 2017. The Second Digital Turn: Design Beyond Intelligence, MIT Press.

First digital turn

- Circa 1990, renowned architects **embraced digital change**.
- From identical copies to customised or non-standardised products.
- **First generation** of digital design and fabrication.
- Digital fabrication does not use mechanical matrices, casts, stamps or moulds.
- Making digital copies will not reduce the cost.

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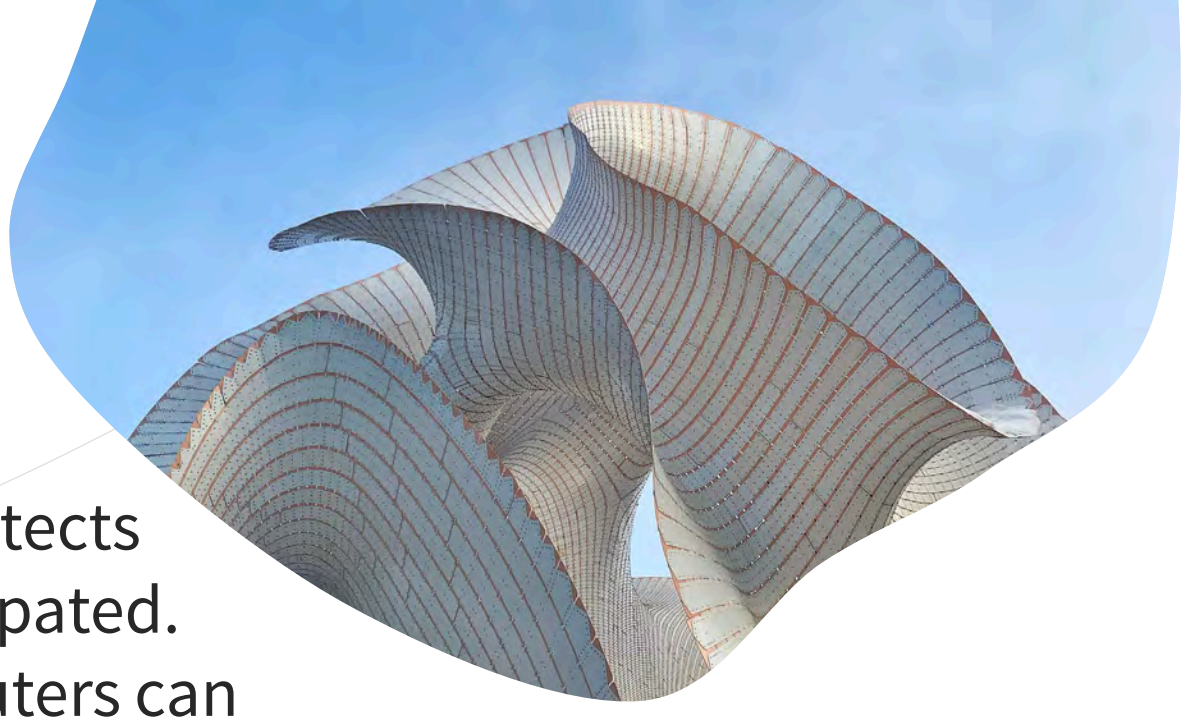
Second digital turn



- Separation of the ways architects **think, draw and make** dissipated.
- Non-humanistic way: computers can work faster.
- New taxonomy of digital architecture.
- Oxman (2008): digital architecture as a **challenge in design pedagogy**.
- Oxman and Oxman (2014), an edited book: **theoretical foundations** of this new architecture.

Oxman, Rivka (2008). Digital architecture as a challenge for design pedagogy: theory, knowledge, models and medium. Design Studies, 29, 99-120.
Oxman, Rivka and Oxman, Robert (2014). Theories of the digital in architecture / [edited by] Rivka Oxman and Robert Oxman, Routledge, Taylor & Francis Group.

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CONCERNS IN DIGITAL TURNS IN ARCHITECTURE

Mia A. Tedjosaputro

Peer-reviewed conference paper

Concerning digital design in architectural pedagogy

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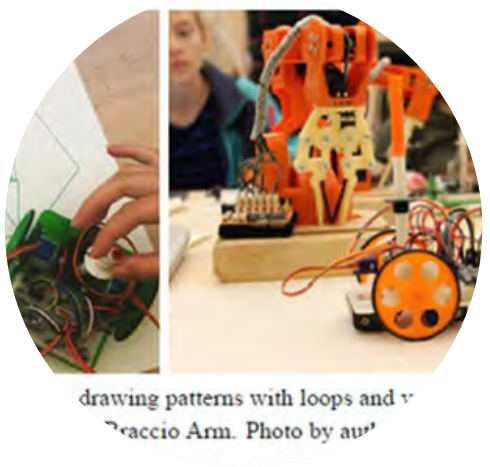
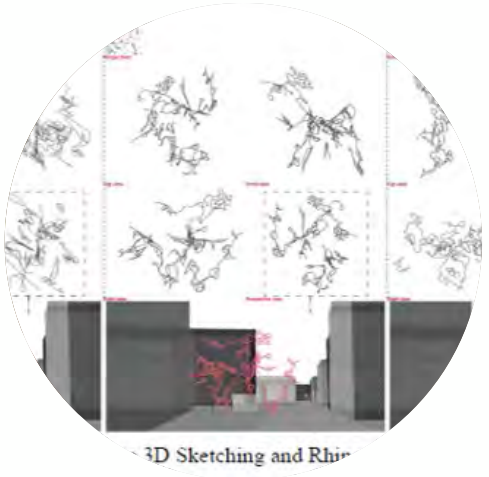
Abstract. The emerging field of digital design in architecture has changed the way designers think and the way it should be taught. This paper looks at six design educational exercises which have adopted digital tools using various systems. Discussions are rooted in digital design cognition, digital design eco-system and pedagogy. This paper attempts to observe the change of ways of making within these themes using design cognition lens. It is proposed that digital design tool affordances is a pertinent concept to support this emerging field, both pedagogically and with regard to software development. It is also suggested that the digital eco-system framework need to include the dialogue between analogue and digital design tools.
Keywords: Digital design cognition, pedagogical approach, design tools affordances

Research methodology:

Six design education practices



drawing patterns with loops and
Braccio Arm. Photo by au



3D Sketching and Rhi

gure 1. (left) The Virtual Env
(right) The

position in stereos

1. WebVR website w

Jigsaw reading

STEP 1	**Group allocation**
STEP 2	**Read input texts individually**
STEP 3	**Summarise text to group members**
STEP 4	**Short quiz (see guiding Qs)**
STEP 5	**Evaluate each others' performance**

Concerns are classified into three categories

01 **Digital design cognition**

02 **Digital design eco-system**

03 **Digital design pedagogy**

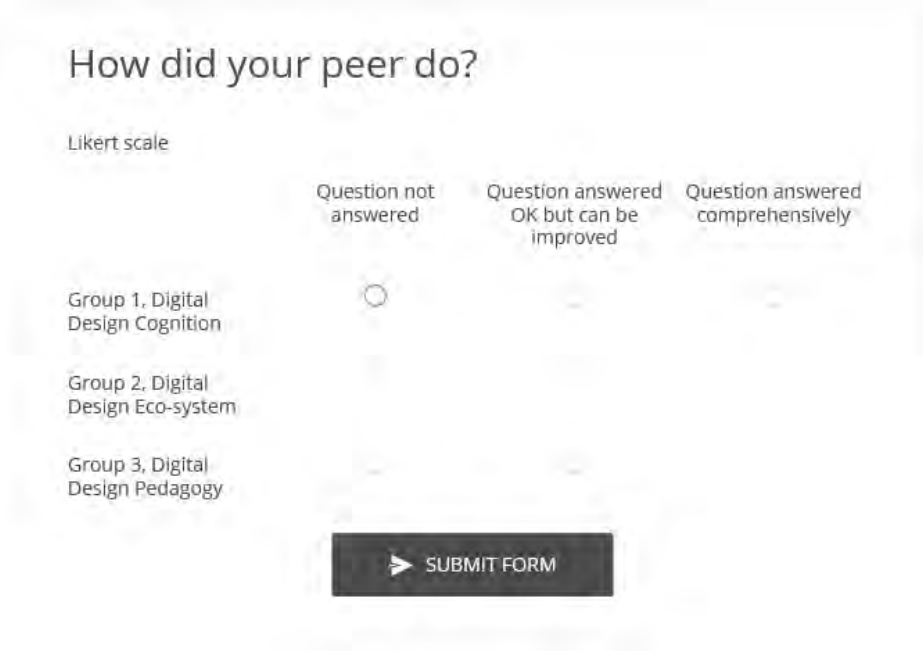
QUIZ Guiding questions

What was the main point?

What was most interesting detail?

Was there anything in the reading that you disagree with? Why?

Peer evaluation



SCAN THE CODE

OR GET THE LINK AS BELOW

http://www.123formbuilder.com/form-5316174/form

Re-thinking architectural pedagogy

Knowing when and why **digital mass customisation** is needed.
Celebrating **craftmanship**.
Re-learning from the **“local wisdom”.**
Architects in the middle during of the act of: notating, representing and fabricating.
Utilising **technological advances** to full potential.

Re-iterated aims and objectives

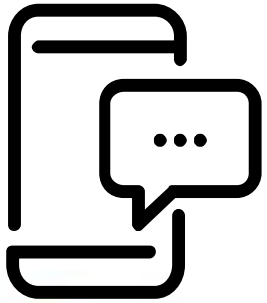
- To elicit students' current level of knowledge about digital architecture through brainstorming
- To introduce students to digital turns in architecture
- To introduce important concepts concerning architecture pedagogy in response to the digital turns

Homework

Further reading

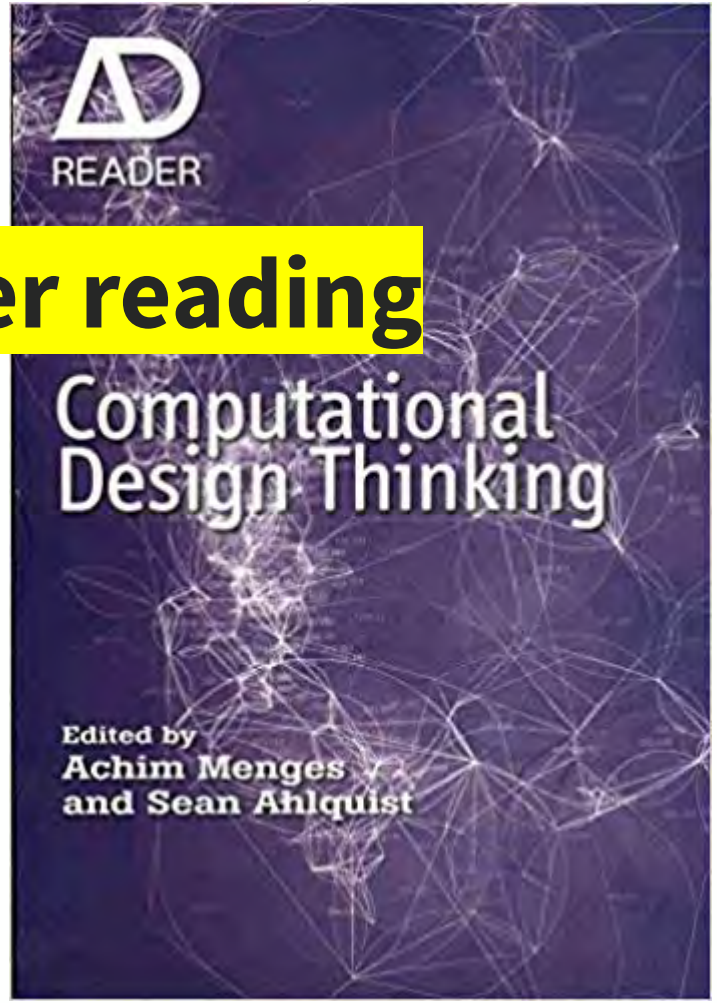
"How has your understanding of digital architecture changed?"

https://miatedjosaputro.com/2020/02/28/pgche-edu710-assignment-1-practice-class-materials/



Online forum discussion. Will be reviewed before the start of next class.

Further reading



Organisation with regular conferences

ACADIA: http://acadia.org/

CAADRIA

01

Digital design cognition

- The shift is the **relational value** between designers and design tools.
- Proposing the use of ***embodied cognition**** lens in design studies.
- Mind-body-design environment.
- “What is the dialogue between designers and (digital) design tools in the design ideation process?”
- Design tool affordances.

* Tedjosaputro, M. A. & Shih, Y.-T. (2019). Perceiving Design Processes as Embodied Experience. Research into Design for a Connected World. Springer.

02

Digital design eco-system

- Digital tools do not work in isolation.
- **The eco-system** hosts a variety of design software in application.
- **Dynamic ecosystem** is proposed by case study #7.
- Selection of tools entails strength and weaknesses of **designers** and **tools** (#6)
- **Interoperability** challenges (#5).
- **Design fixation** challenges.

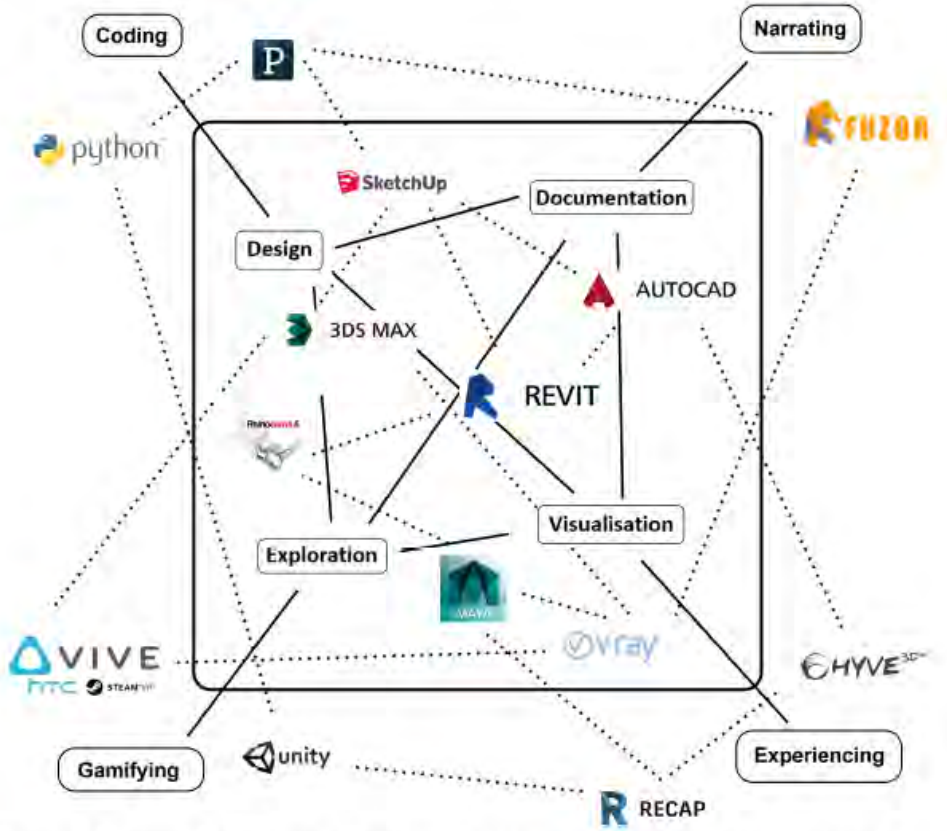
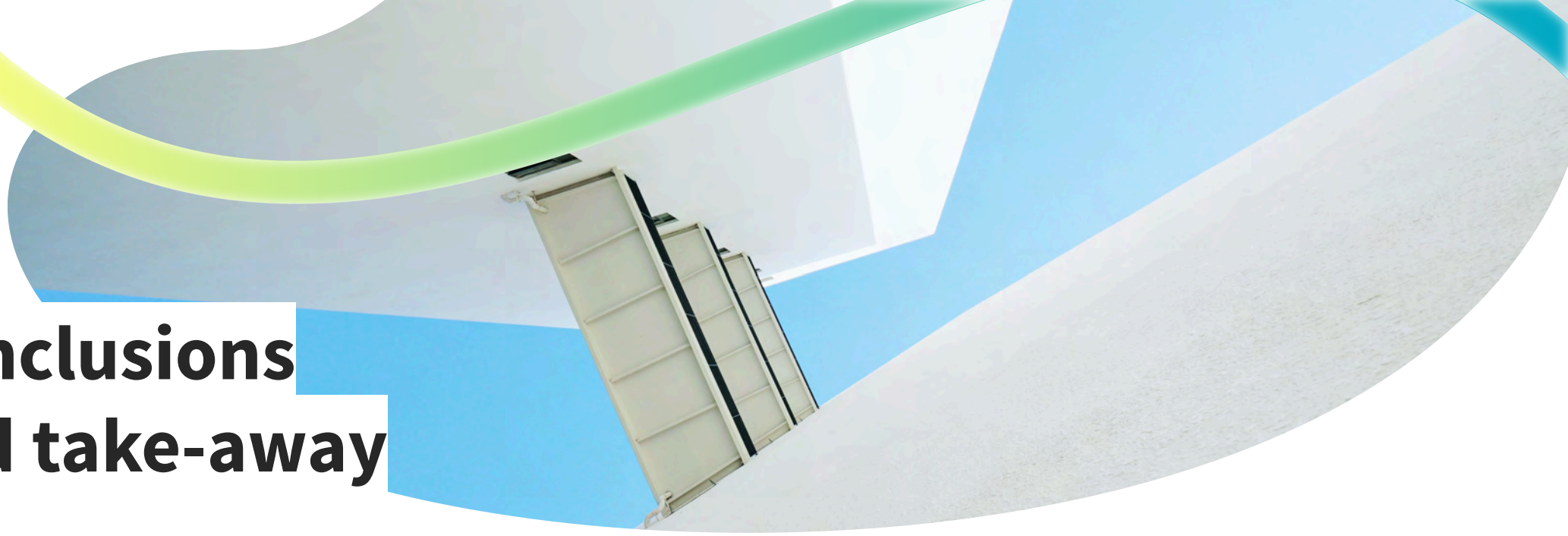


Figure 4. Dynamic Eco-system of the design process expanded from the conventional design process.

03 Digital design pedagogy

- Specialist software requires specialist knowledge.
- **Potential problems**: design fixation and lack of understanding of design tool affordances.
- New design skills are shaped.
- **Scripting** in architecture pedagogy?
- Suggestions: subtle **transitions** between analogue and digital design pedagogy.



Conclusions and take-away

01

Design behaviour has shifted due to the change of relational value between designers and digital design tools.

02

From CAD (Computer Aided Design) to computational design, as a new discourse.

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