

Week 3

Digital design practice and research groups

This week we will look at dialectics between digital design practices and research. This is relatable to the shift of think-draw-make in recent digital turn.



Outline

01

Computational design research groups

Six research groups worldwide.

02

Architectural practices

Computational design offices
worldwide.

03

The dialectics: academia and practice

Discussion will be shaped
around designing through
making.



Aims and objectives





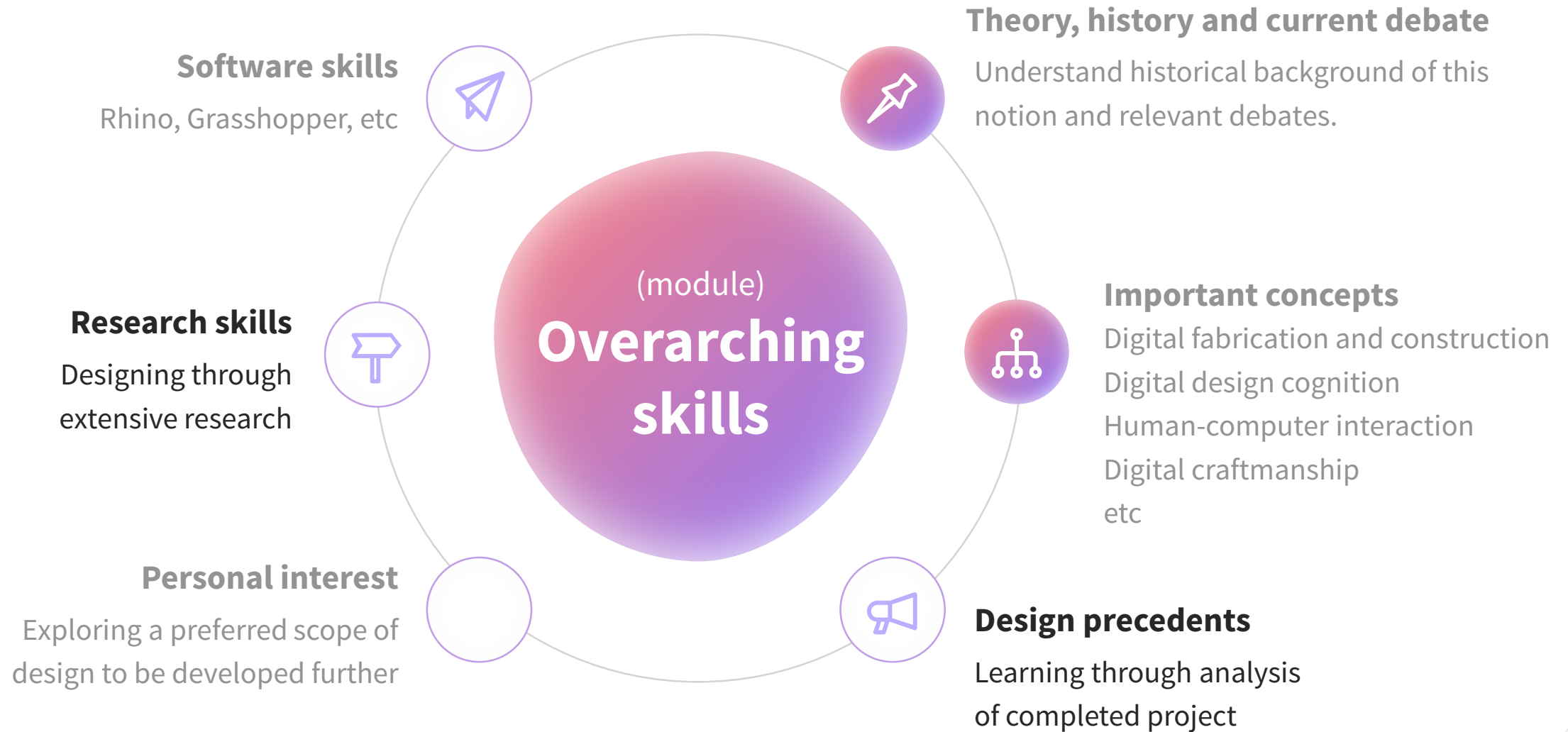
- To exemplify leading **research groups** in computational design.
- To elicit different approaches exhibited by **architecture design studio** which practices computational design.
- To discuss the **dialectics** between academia and architectural practices.



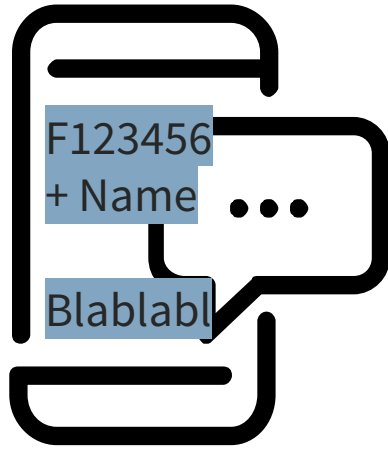
Learning outcomes

Students will be able to..

- 01** Draw **differences** in current computational practices compare to mainstream practices.

- 02** Illustrate how new way architects **think-draw-make** affect practices.

- 03** Discuss the importance of **design through making**.



Discussion



THE ARMADILLO VAULT BALANCING COMPUTATION AND TRADITIONAL CRAFT

PHILIPPE BLOCK / MATTHIAS RIPPMANN / TOM VAN MELE
ETH Zurich - Block Research Group
DAVID ESCOBEDO
The Escobedo Group



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/>

From **previous lectures** we have learnt that..

Collaboration between man and machine has been imagined from 1960s.

Potentials of digital tools for better architecture.

Design practice has gone through important changes due to the proliferation of technology.





**What are the drivers
of these
advancement in
digital tools?**

**Symbiosis of design research
and practice**



Computational design research clusters/groups

A handful of examples

R1

Block Research Group (BRG)
Institute of Technology in Architecture
At ETH Zurich

Led by: Prof. Dr. Philippe Block and Dr. Tom Van Mele

R2

**Institute for Computational Design
and Construction**
University of Stuttgart, Germany

Led by: Univ.-Prof. Achim Menges

R3

Centre for Innovative Structures and Materials,
RMIT University, Australia

Led by: Prof. Mike Xie

Computational design research clusters/groups

R1

Block Research Group (BRG)
Institute of Technology in Architecture
At ETH Zurich



Photo by Mariana Popescu

**KnitCandela - A flexibly formed thin
concrete shell at MUAC, Mexico City, 2018**

KnitCandela is a thin, sinuous concrete shell built on an ultra-lightweight knitted formwork that was carried from Switzerland to Mexico in a suitcase.

Keywords

There are no keywords.

Files



Computational design research clusters/groups

A handful of examples

R4

Design + Make

**Architectural Association, School of
Architecture at Hooke Park**

Led by: Martin Self

R5

Computational Design and Material Systems Innovation

**Taubman College at University of Michigan,
USA**

Core Affiliate: Wes McGee

R6

Digital Design Research Center (DDRC) Tongji University, Shanghai

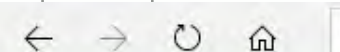
Led by: Prof. Philip Yuan

Computational design research clusters/groups

Design + Make

R4

Architectural Association, School of
Architecture at Hooke Park



Design + Make



Computational design practices

With in-house research unit

A handful of examples

P1

ZHA (Zaha Hadid Architects)

ZHA Code, London

P2

Fosters + Partners

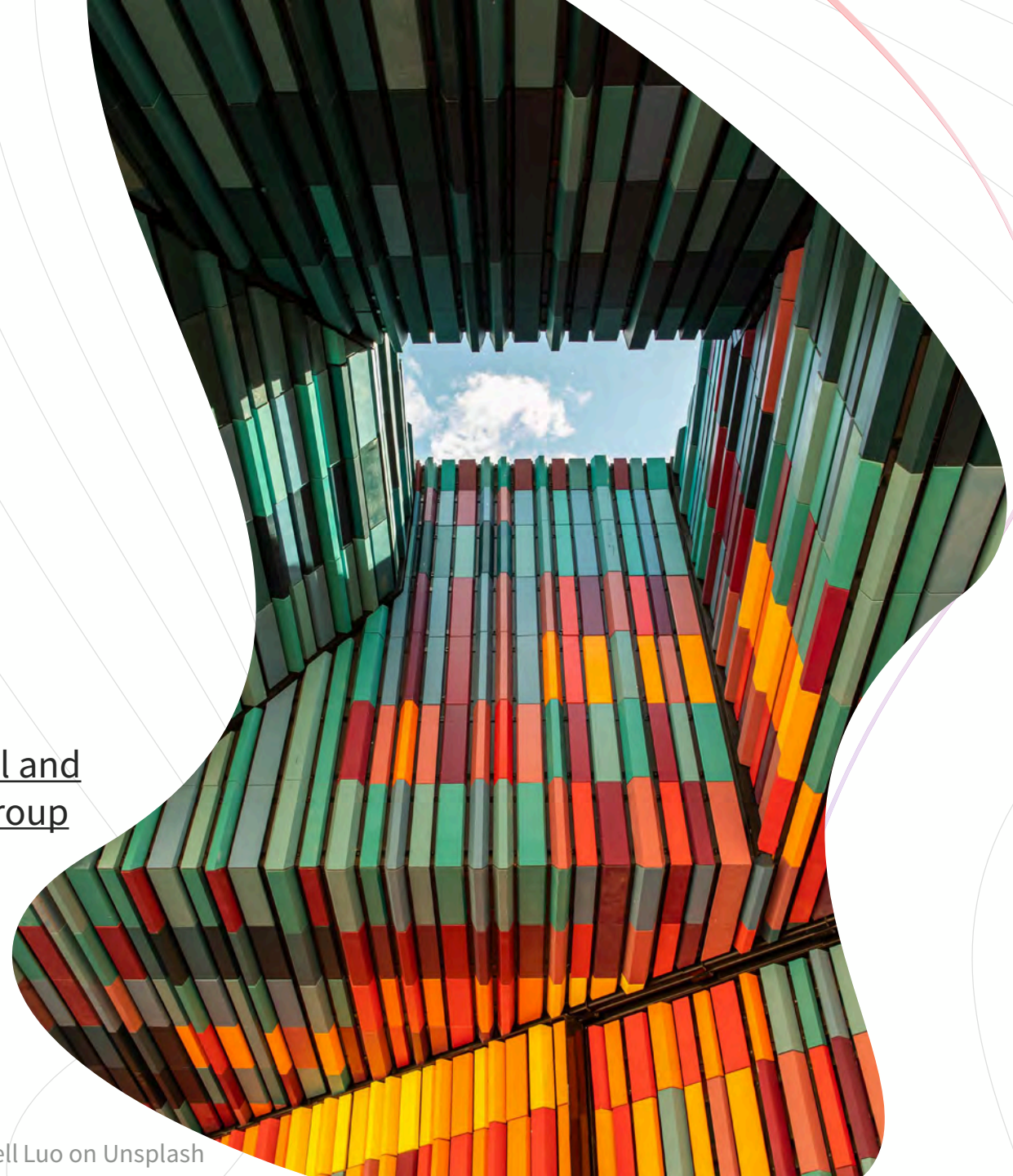
Applied Research and Development, Material and Research Centre, and Specialist Modelling Group

P3

Herzog & de Meuron

Digital Technology Group at Basle office

Photo by Mitchell Luo on Unsplash



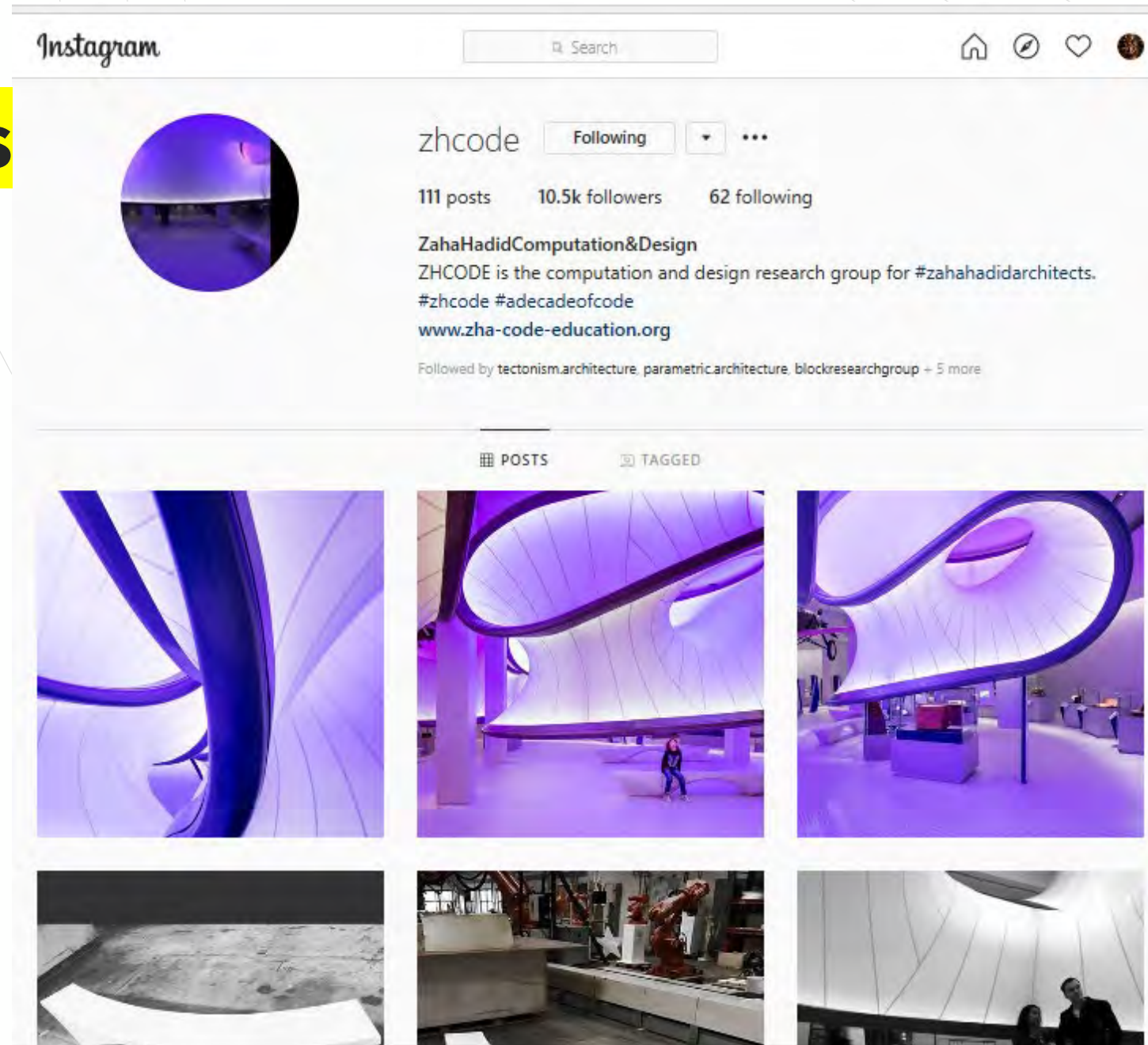
Computational design practices

With in-house research unit

P1

ZHA (Zaha Hadid Architects)

ZHA Code, London



Computational design practices

A handful of examples

P4

BIG (Bjarke Ingels Group)
Copenhagen, New York, London and Barcelona

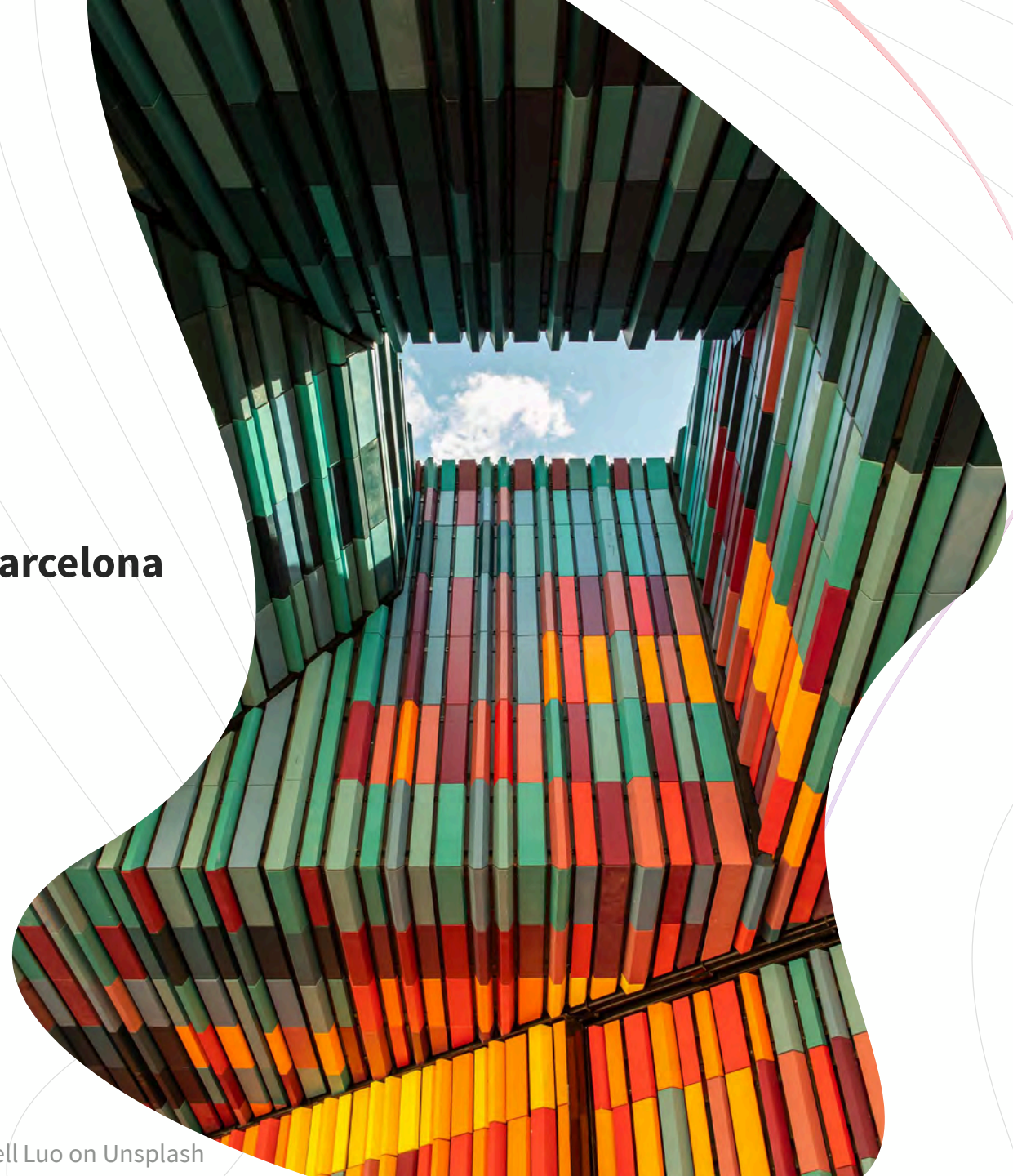
P5

AL_A (Amanda Levete and partners)
London

P6

NaJa & deOstos
London

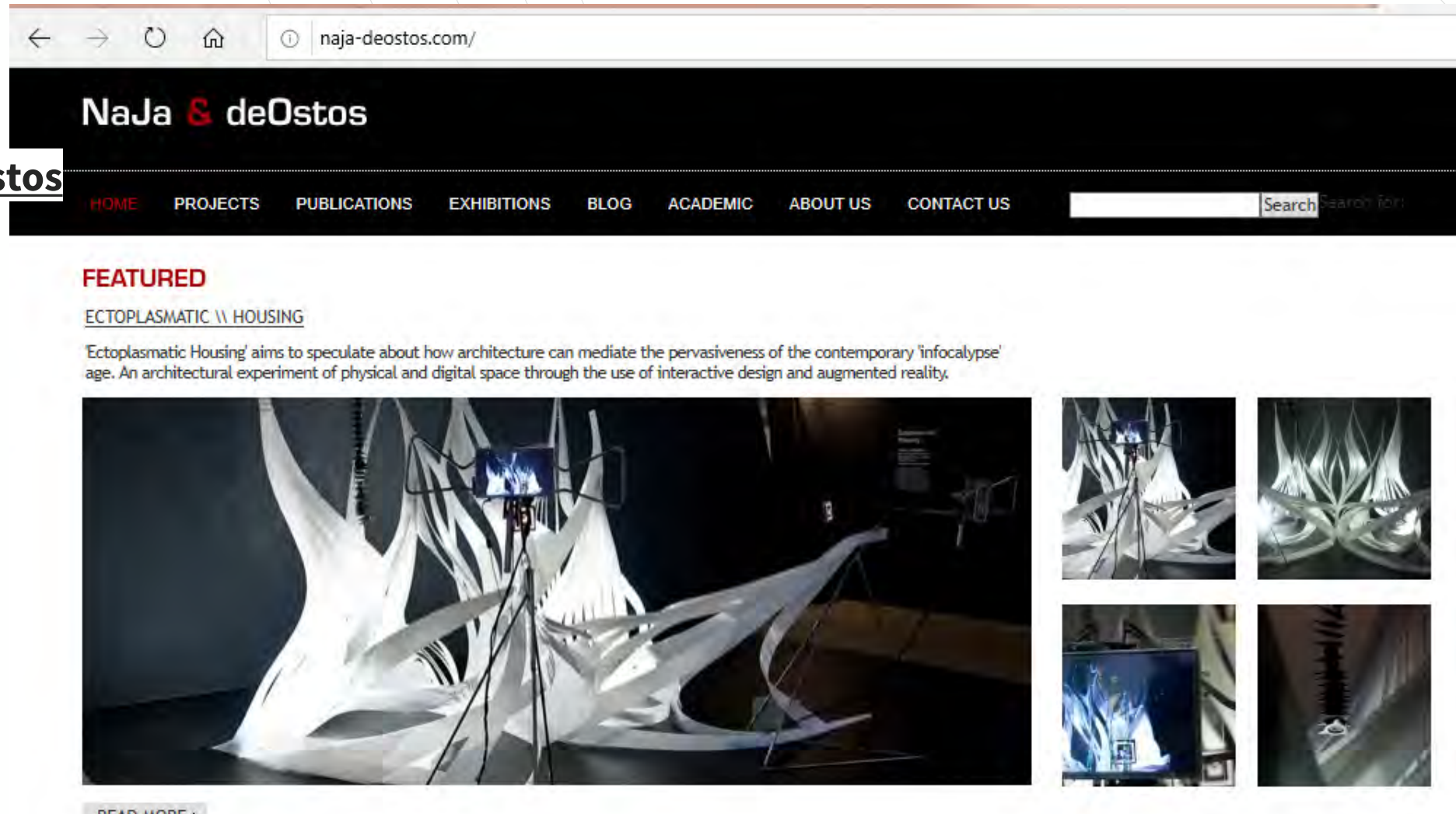
Photo by Mitchell Luo on Unsplash



Computational design practices

P6

NaJa & deOstos
London



Computational design practices

Led by **design academics**

A handful of examples

P7

Archi-Union and Fab-Union Shanghai

Prof Philip Yuan, Tongji University

P8

Philip Beesley Architect

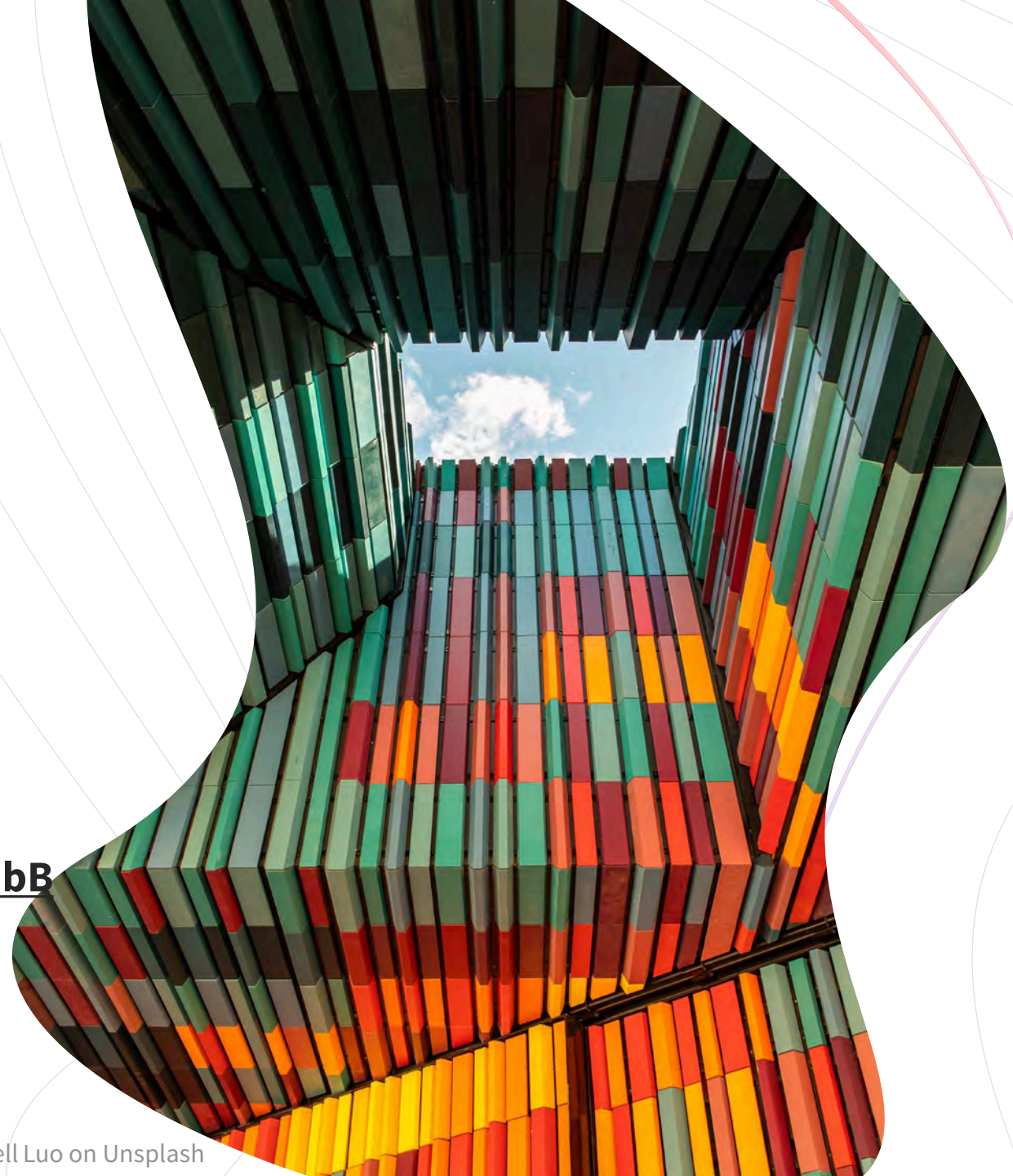
Prof Philip Beesley, University of Waterloo

P9

Menges Scheffler Architekten PartG mbB

Prof Achim Menges, University of Stuttgart

Photo by Mitchell Luo on Unsplash



Computational design practices

Led by design academics

Archi-Union and Fab-Union Shanghai

Prof Philip Yuan, Tongji University

P7

Cross-Scale Topology Bridge | 2019

Tongji University, Zhabei District, Shanghai



Venue B Conference Center | 2018

Longtengdadao, Xuhui District, Shanghai



Starbucks Reserve® ROASTERY
TOKYO | 2018

2-19-23 Aobadai Meguro-ku Tokyo 153-0042



Inkstone House OCT Linpan Cultural
Center | 2018

Anren Town, Chengdu, Sichuan Province, China



Cloud Village | 2018

Venice, Italy



Cloud Pavilion | 2017

Gangcheng Plaza, Lingang New City, Pudong

New District, Shanghai





Philip Bee

University of Waterloo

Home

Computational design practices

Led by design academics

P8

Philip Beesley Architect

Prof Philip Beesley, University of Waterloo

DISSIPATIVE ARCHITECTURES

CITA, The Royal Danish Academy of Fine Arts, Workshop & Installation
Copenhagen, Denmark - October, 2015

Increasingly, the surfaces, buildings and environments that surround us are
embedded with interactive potentials. Capable of sensing and actuation



PDF ARTICLE

MENGES SCHEFFLER ARCHITECTS

Computational design practices

Projects Office Contact English



Research buildings

Led by design academics

Menges Scheffler Architekten PartG mbB

Prof Achim Menges, University of Stuttgart

Baden-Wuerttemberg Haus, World Expo 2020, Dubai

2. Preis

P9



2017 ICD (A. Menges) & ITKE (J. Knippers) Uni Stuttgart

Vitra Campus

Elytra Filament Pavilion, Vitra Campus

