

Parametric Design

# #01 – Introduction

Prof. Dr. Sebastian Meier

# Digital Design

## Parametric Design – Introduction

# Digital Design

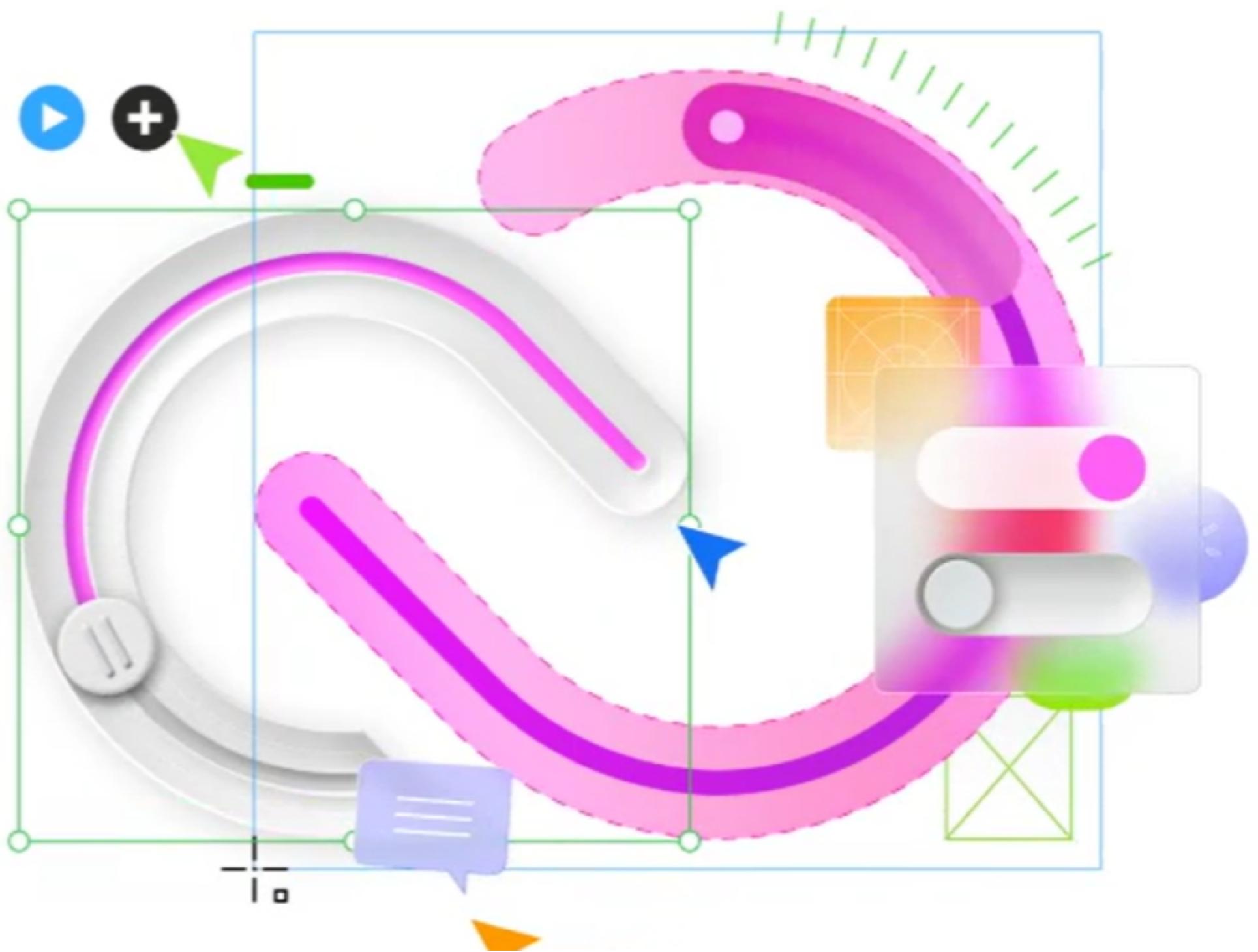


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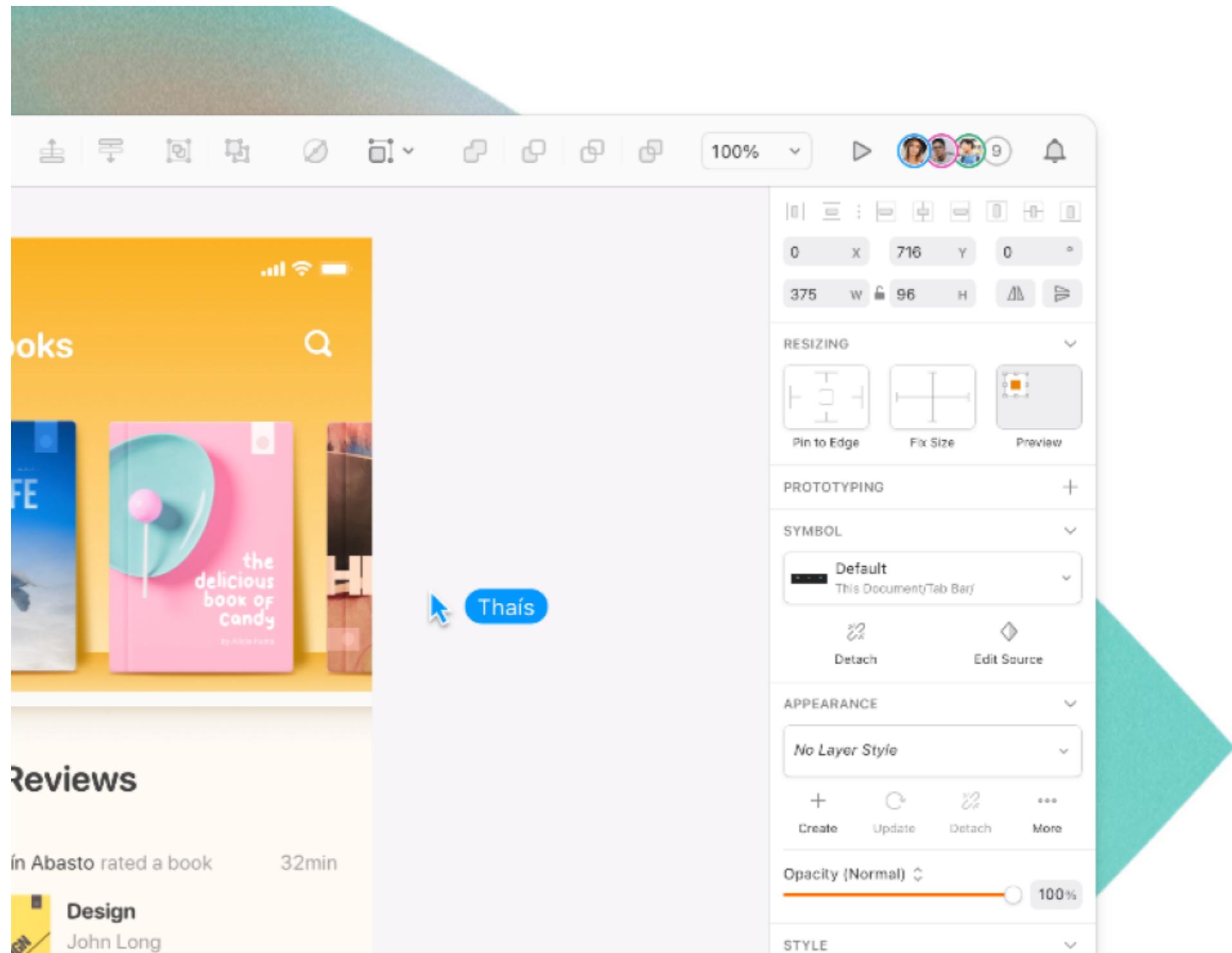
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Source: Screenshot [adobe.com/creativecloud.html](http://adobe.com/creativecloud.html)

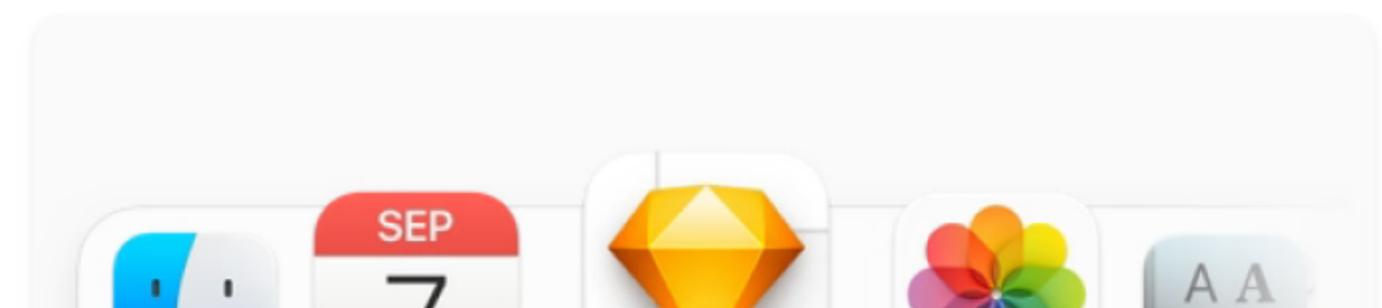
## Parametric Design – Introduction

# Digital Design



## The all-in-one designer's toolkit

Whether you're collaborating on new concepts, freshening up an old flow or crowning an app with the perfect icon, we've got you covered for your whole design process.

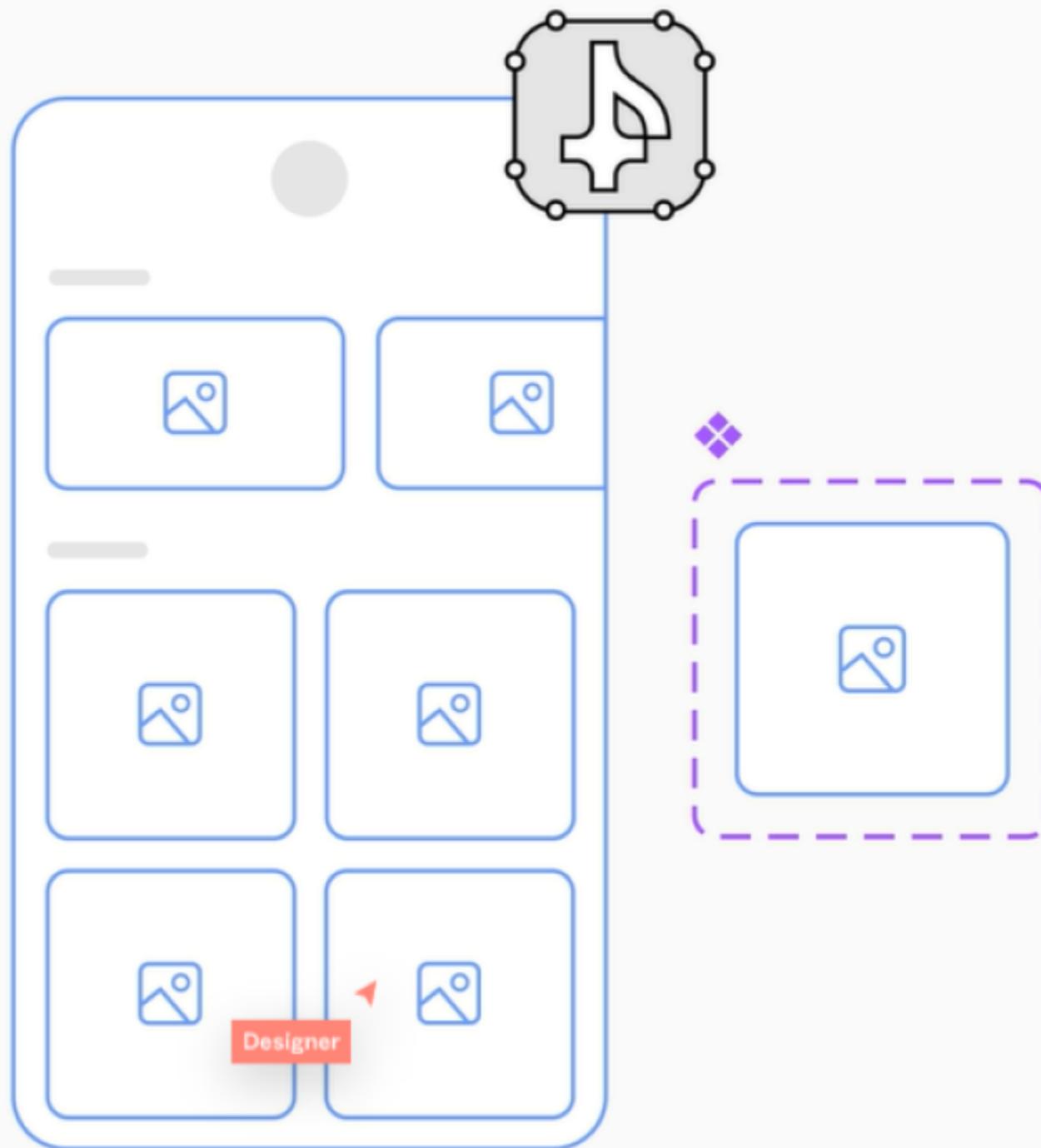


Source: [Screenshot sketch.com](https://www.sketch.com)

# Digital Design

**Bring those ideas  
to life**

FigJam and Figma live side-by-side,  
so all design work, from ideation to  
execution, can be found in one place.

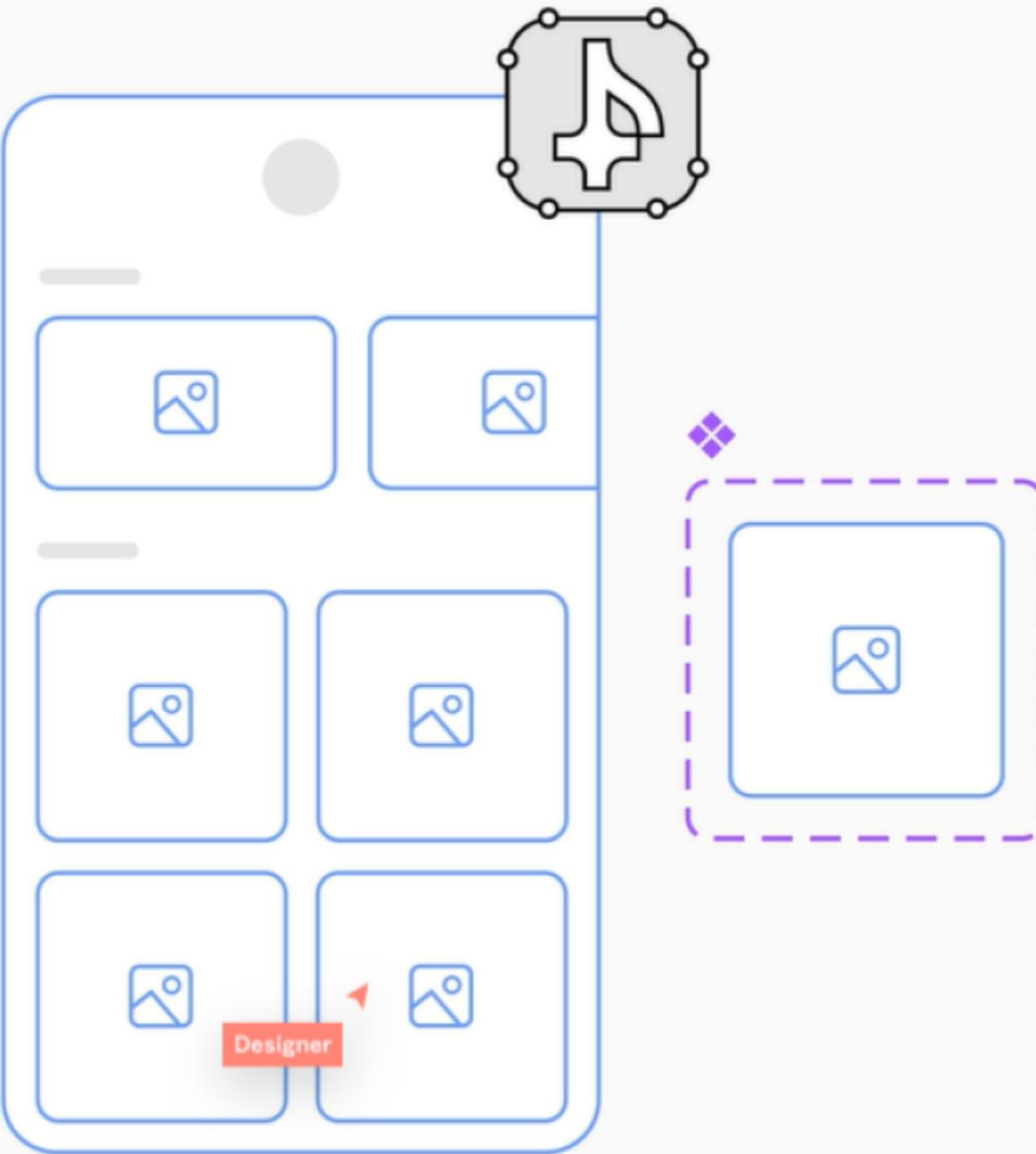


Source: Screenshot figma.com

# Digital Design

**Bring those ideas  
to life**

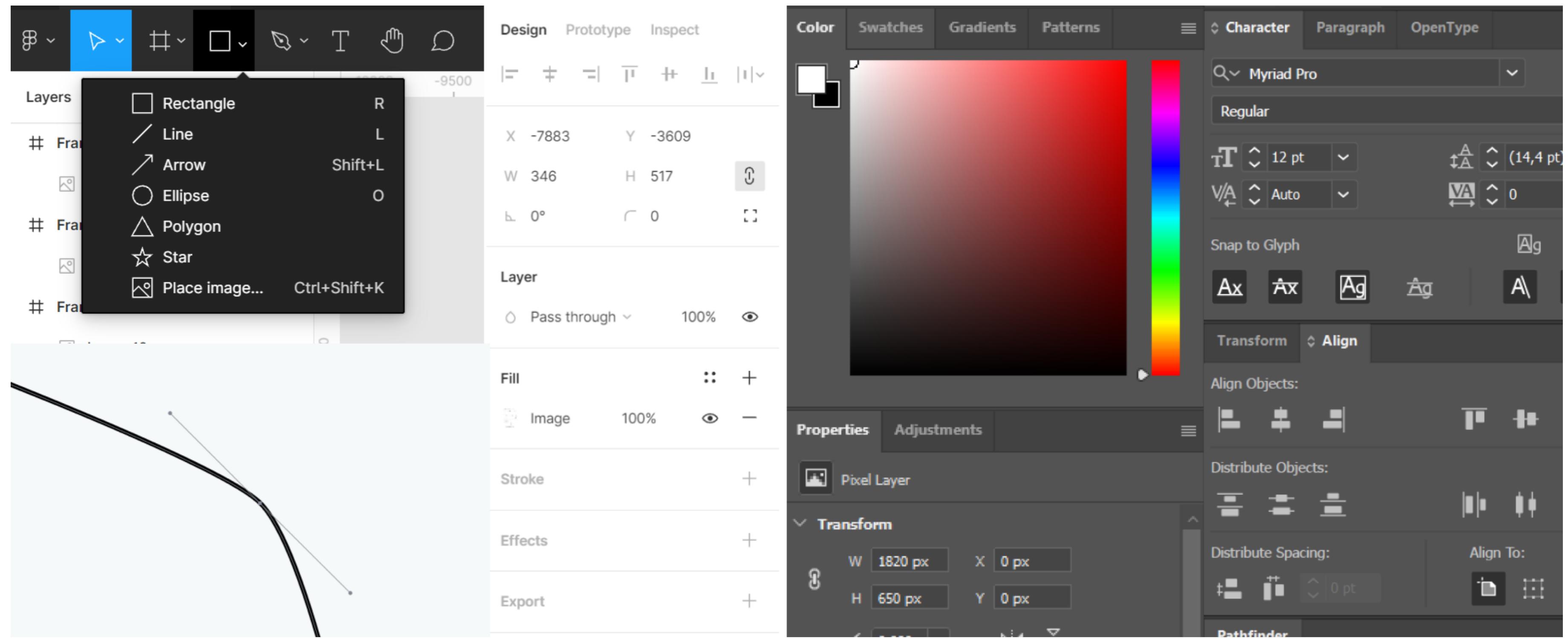
FigJam and Figma live side-by-side,  
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Source: Screenshot figma.com

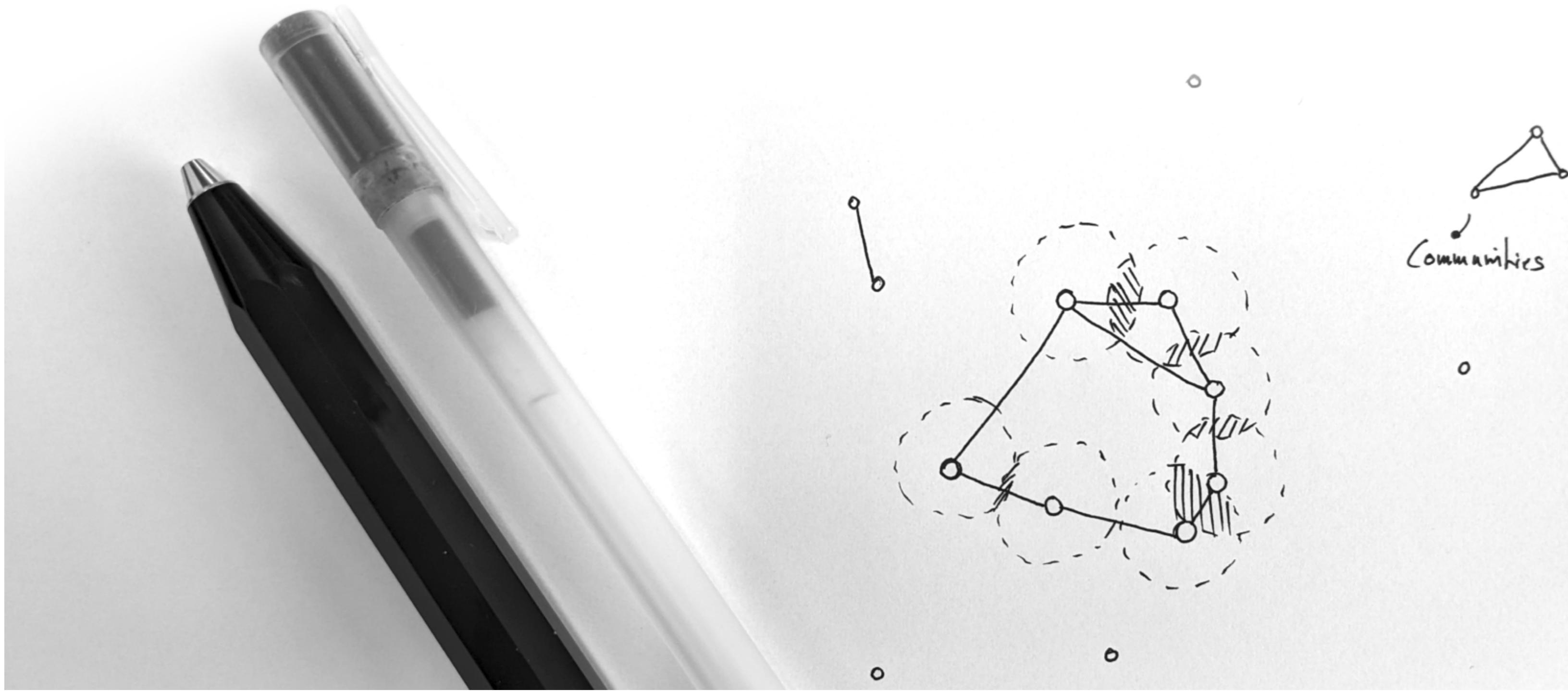
## Parametric Design – Introduction

# Digital Design



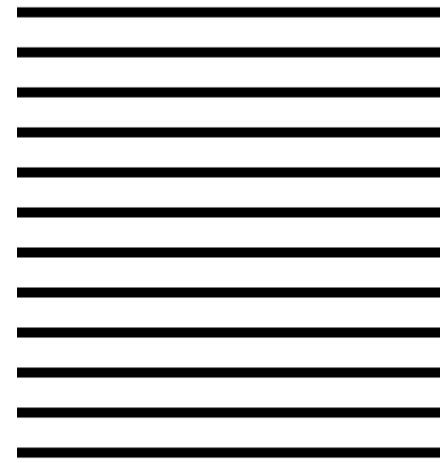
Source: Screenshots Adobe Illustrator/Photoshop, Figma

# Digital Design

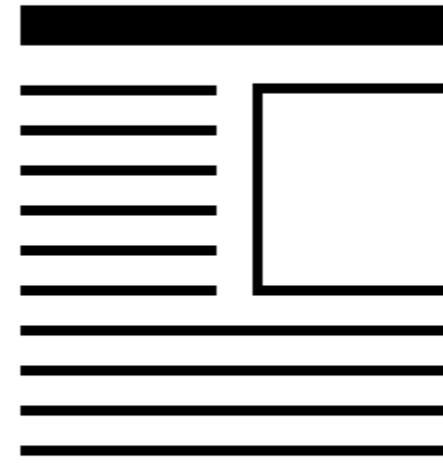


# Design Formats

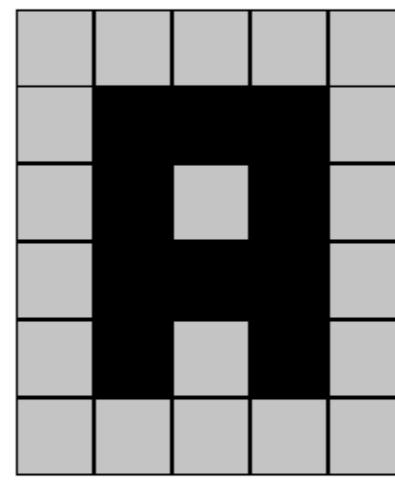
Raw Text



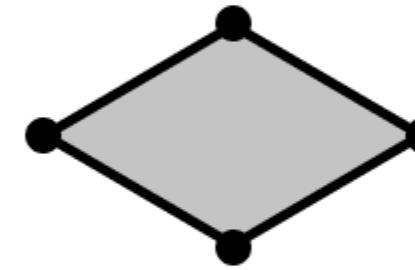
Layout Documents



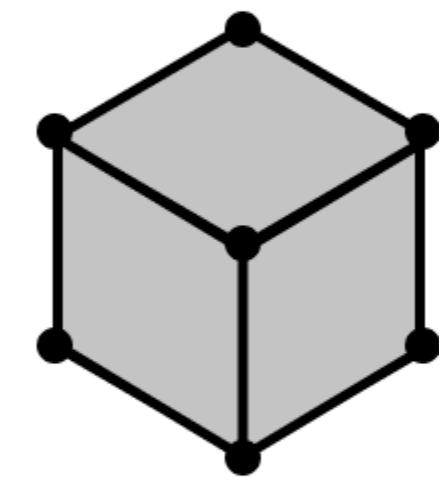
Images



Vector 2D



Vector 3D



Text

Markup

Pixel

Various vector structures

# Design Formats

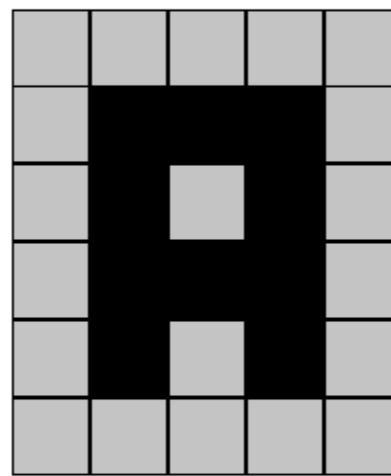
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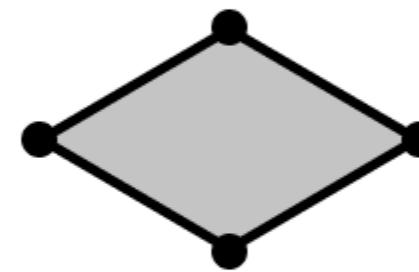
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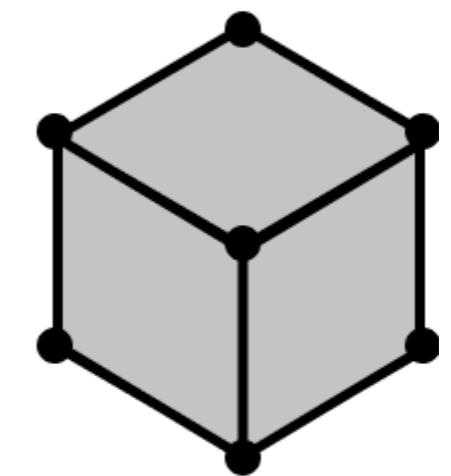
Images



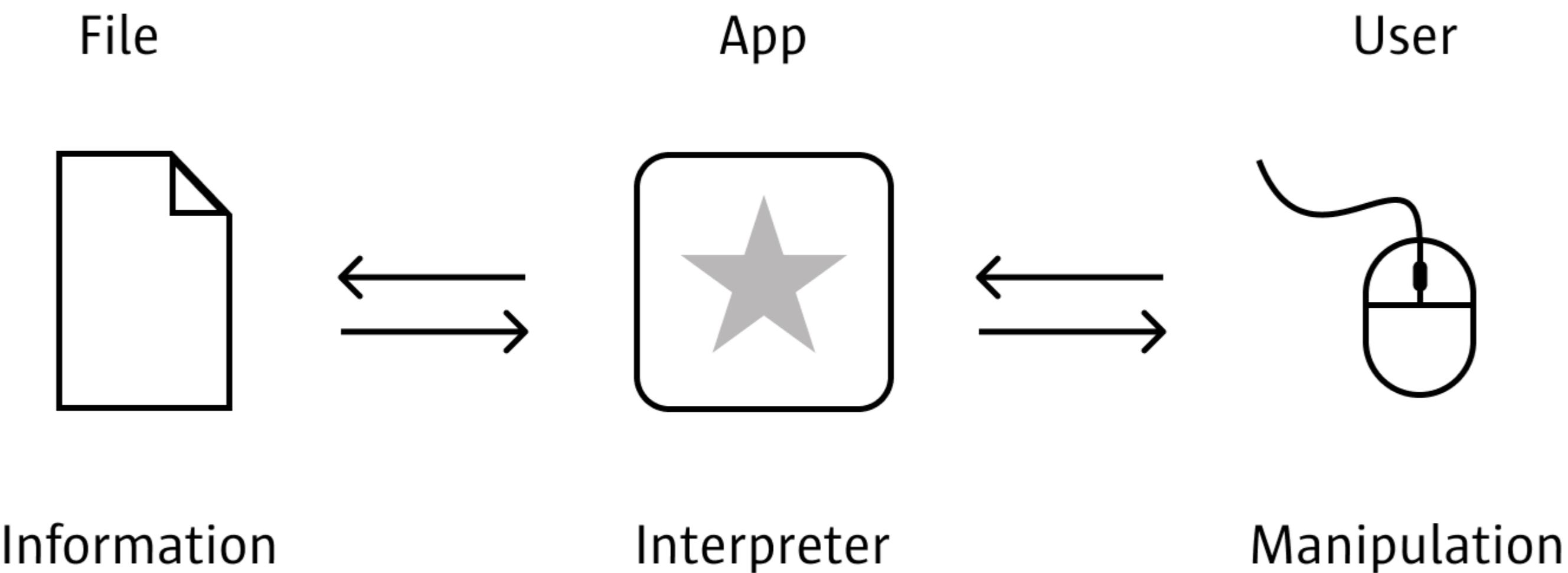
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Vector 3D

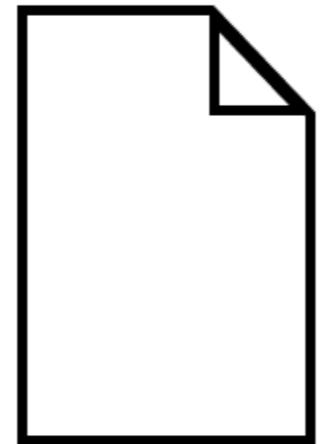


# Software in the Design Process

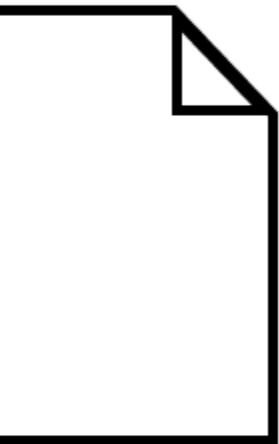


# Software in the Design Process

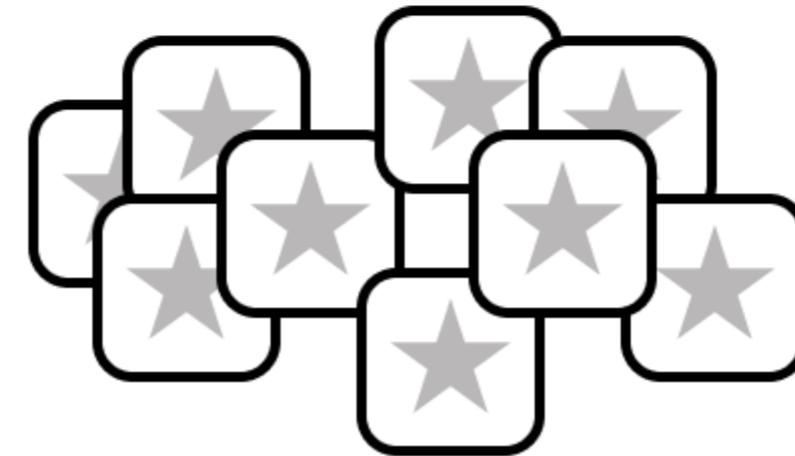
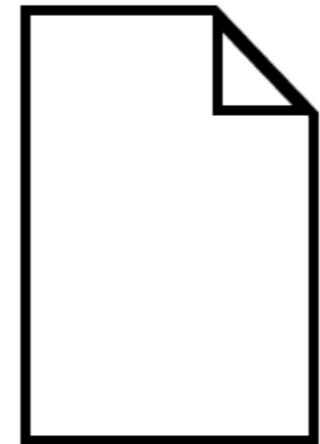
Proprietary Formats



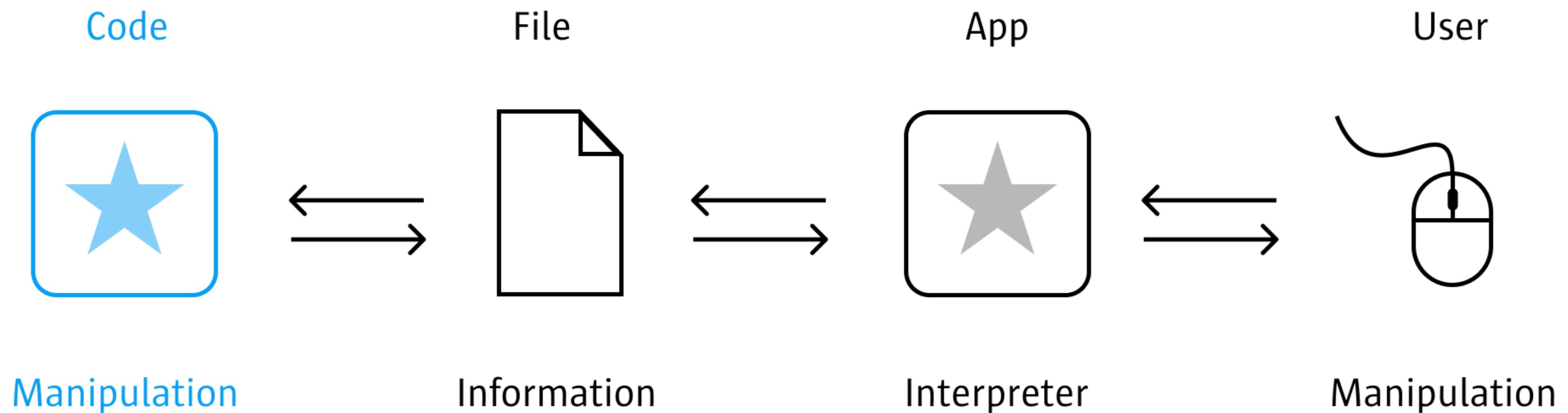
Open Formats



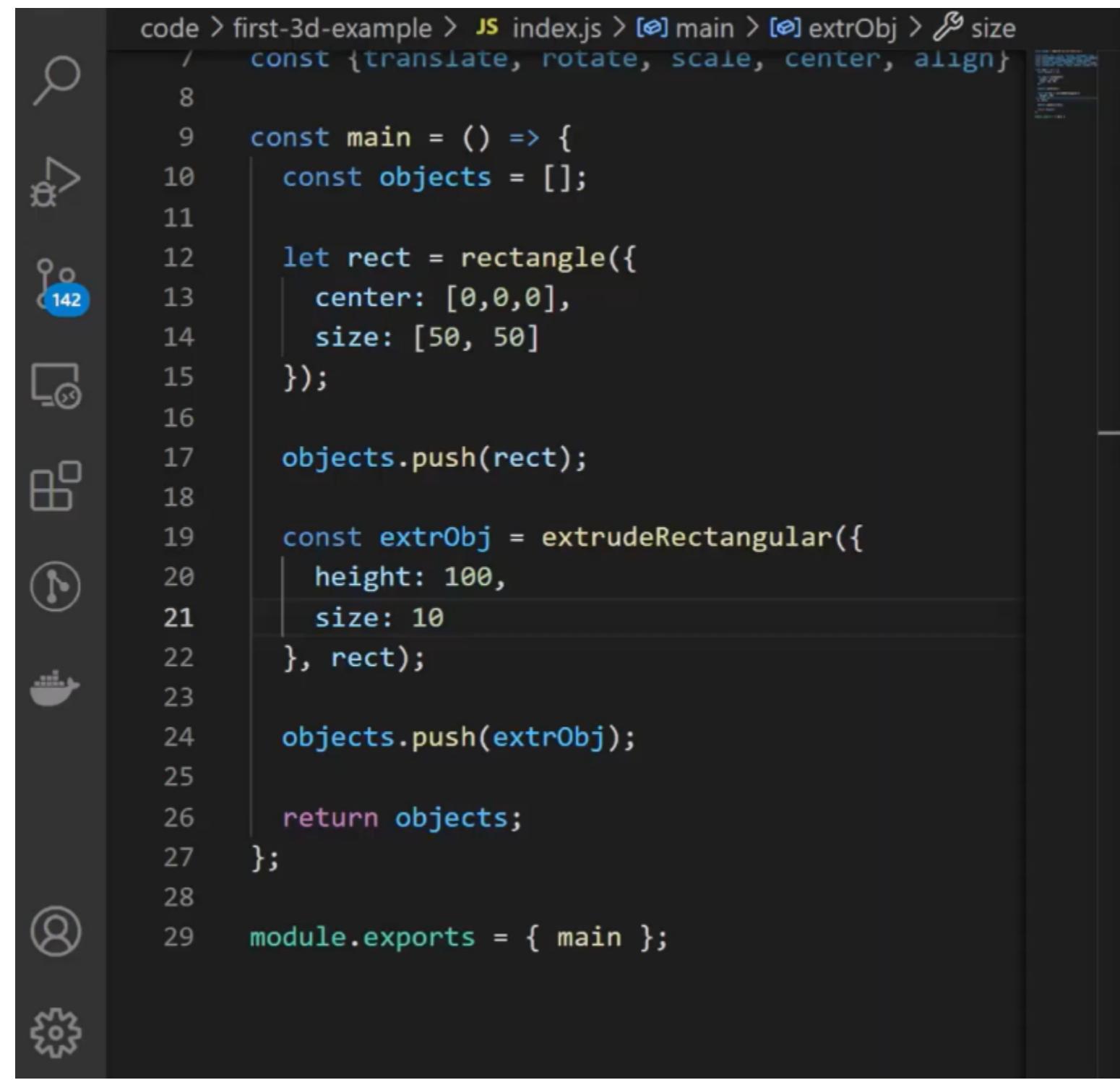
Standardised  
Open Format



# Parametric Design

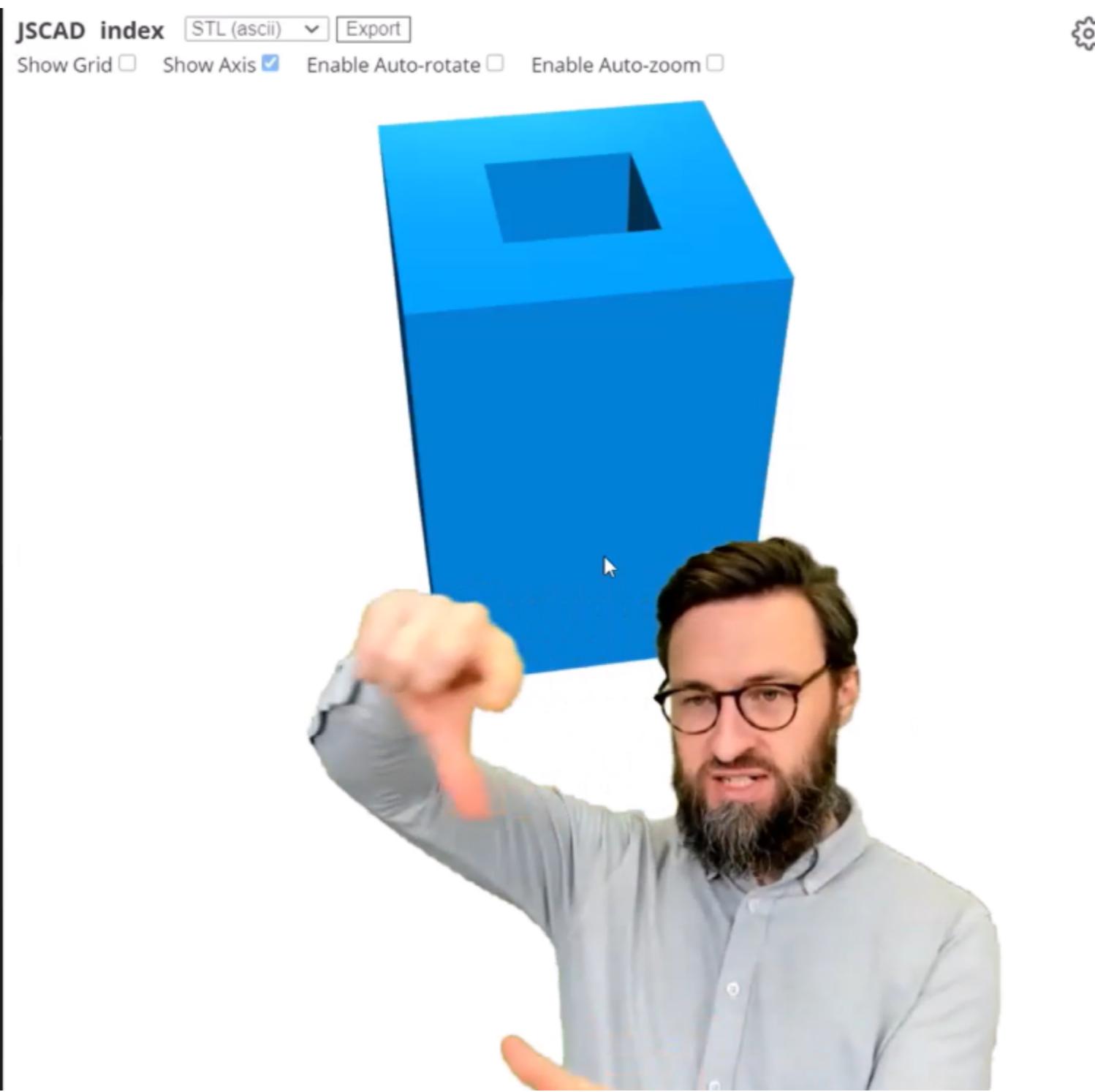


# Parametric Design

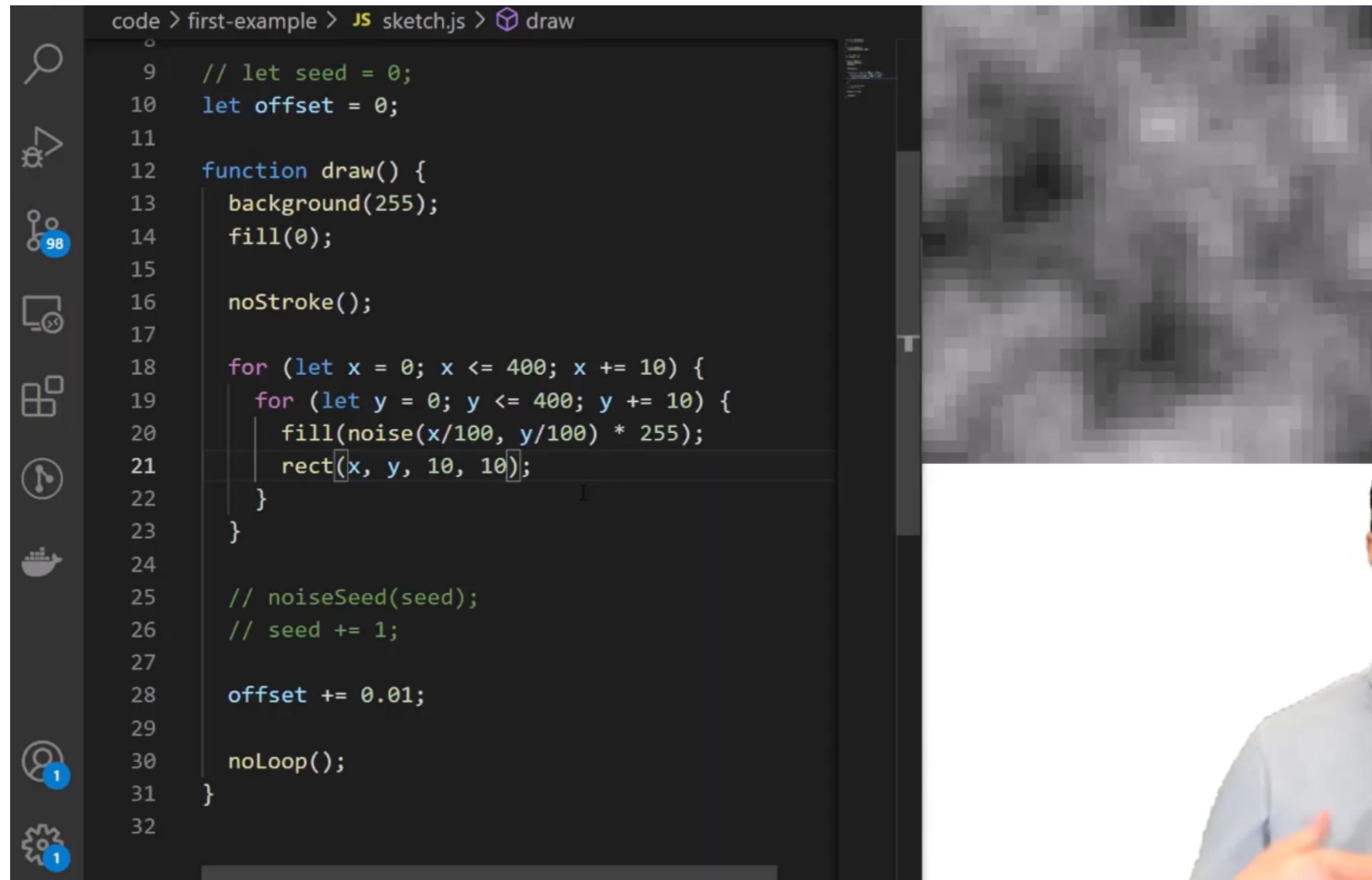


A screenshot of a code editor showing a JavaScript file named `index.js`. The code defines a `main` function that creates a blue rectangular base and a blue extruded rectangular object on top of it. The code uses functions like `rectangle` and `extrudeRectangular` with parameters for center, size, height, and width.

```
code > first-3d-example > JS index.js > [o] main > [o] extrObj > ⚙ size
  /   const {translate, rotate, scale, center, align}
  8
  9   const main = () => {
10     const objects = [];
11
12     let rect = rectangle({
13       center: [0,0,0],
14       size: [50, 50]
15     );
16
17     objects.push(rect);
18
19     const extrObj = extrudeRectangular({
20       height: 100,
21       size: 10
22     ), rect);
23
24     objects.push(extrObj);
25
26     return objects;
27   );
28
29   module.exports = { main };
```



# Parametric Design



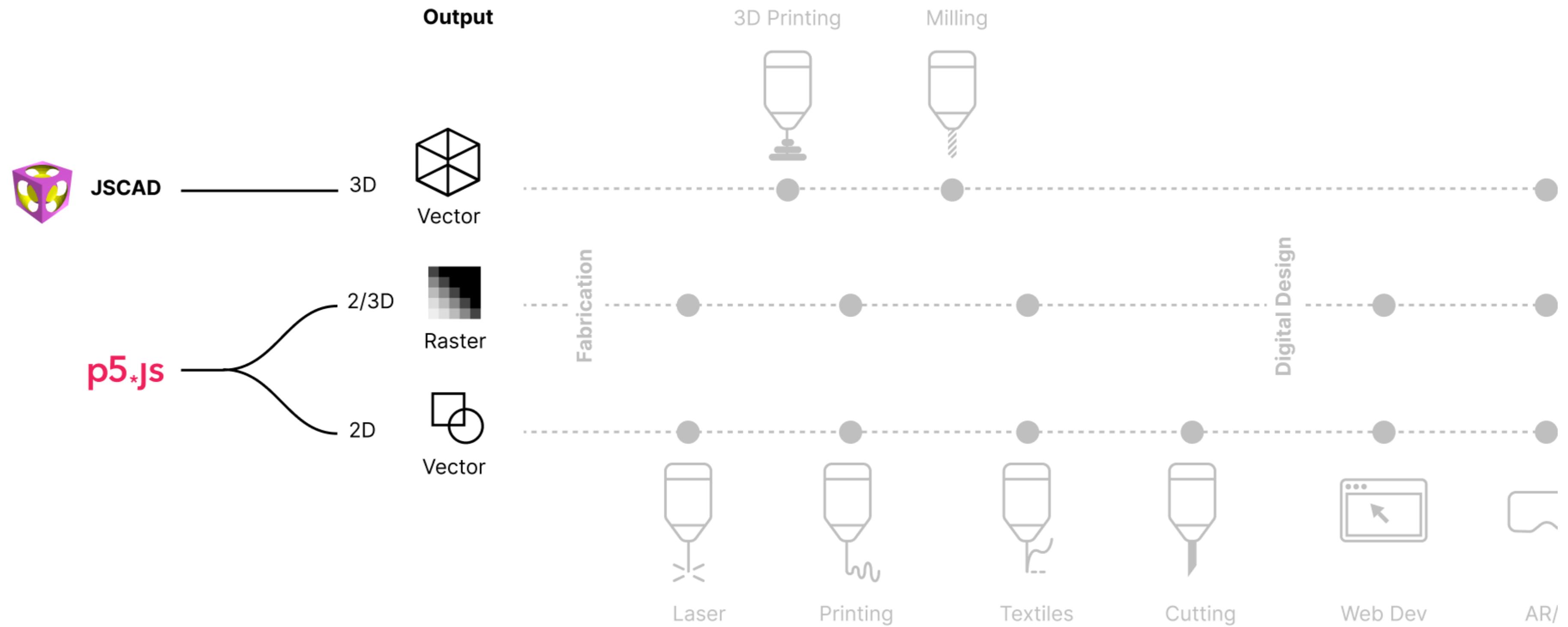
The image shows a code editor interface with a dark theme. On the left, there's a sidebar with various icons: a magnifying glass, a triangle, a circle with a dot, a square with a circle, a rectangle with a circle, a gear, and a question mark. Some of these icons have blue circles with numbers on them (e.g., 98, 1). The main area shows a file named 'sketch.js' under 'code > first-example > JS'. The code is as follows:

```
code > first-example > JS sketch.js > draw
  9  // let seed = 0;
10  let offset = 0;
11
12  function draw() {
13    background(255);
14    fill(0);
15
16    noStroke();
17
18    for (let x = 0; x <= 400; x += 10) {
19      for (let y = 0; y <= 400; y += 10) {
20        fill(noise(x/100, y/100) * 255);
21        rect(x, y, 10, 10);
22      }
23    }
24
25    // noiseSeed(seed);
26    // seed += 1;
27
28    offset += 0.01;
29
30    noLoop();
31  }
```

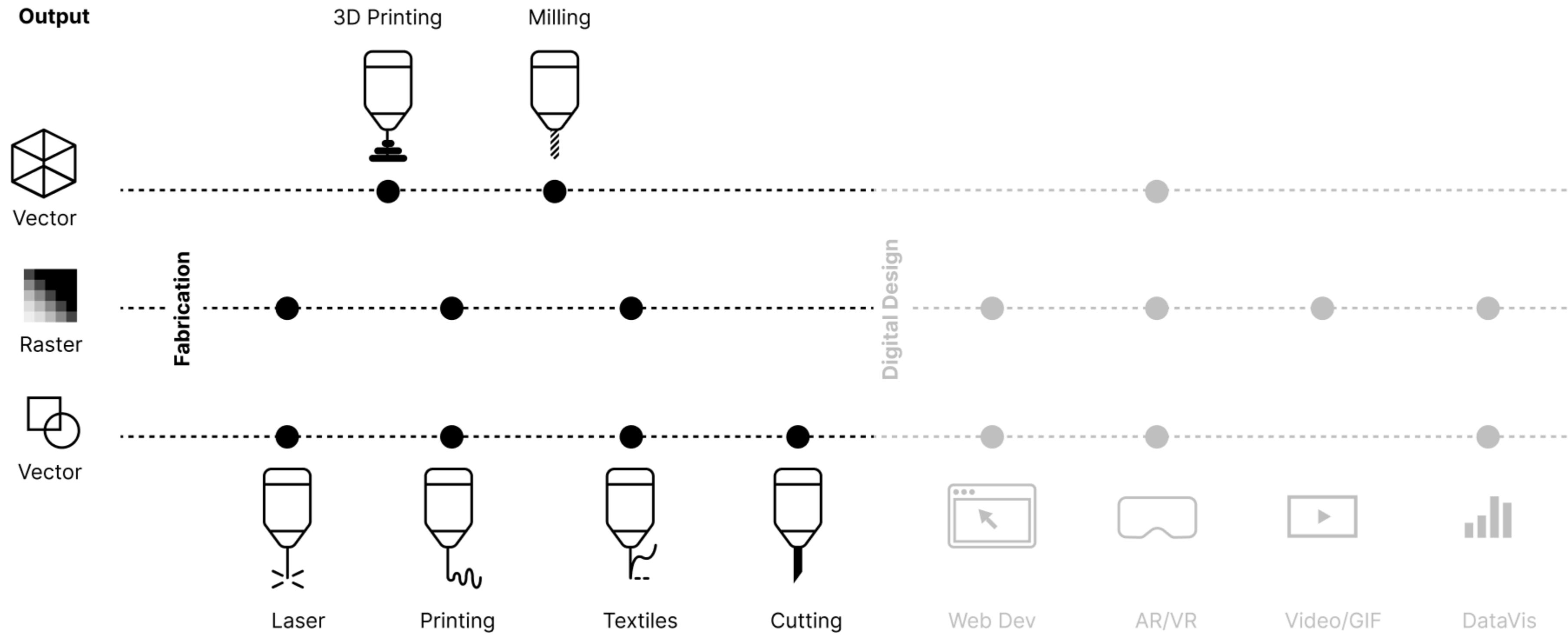
To the right of the code editor is a preview window showing a grayscale noise pattern with a grid of small rectangles.



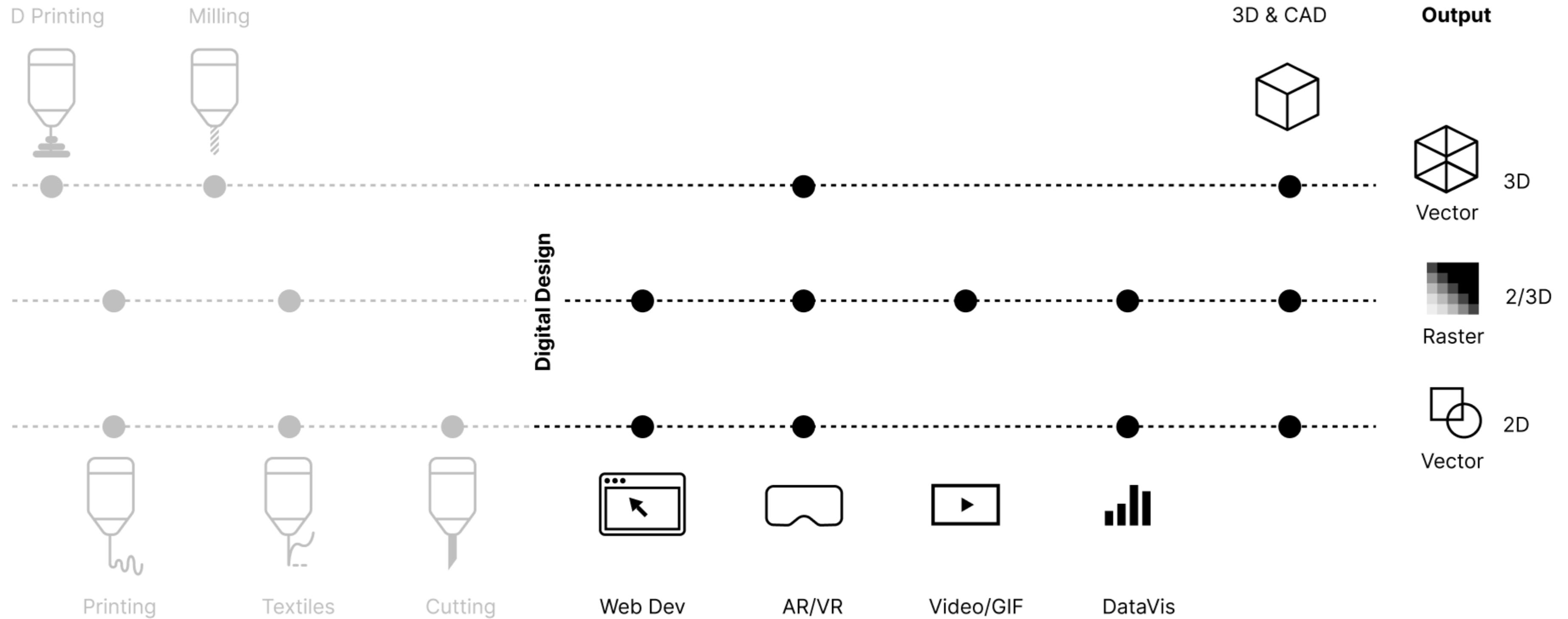
# Parametric Design



# Parametric Design



# Parametric Design



# Parametric Design

What is Parametric Design?

# Thinking in systems



Quelle Bild: <https://www.apple.com>

Parametric Design – Introduction

# Thinking in systems



Source: <https://blog.google/products/android/android-12-beta/>

## Parametric Design – Introduction

# Thinking in systems



Source: ArsTechnica.com, Ron Amadeo

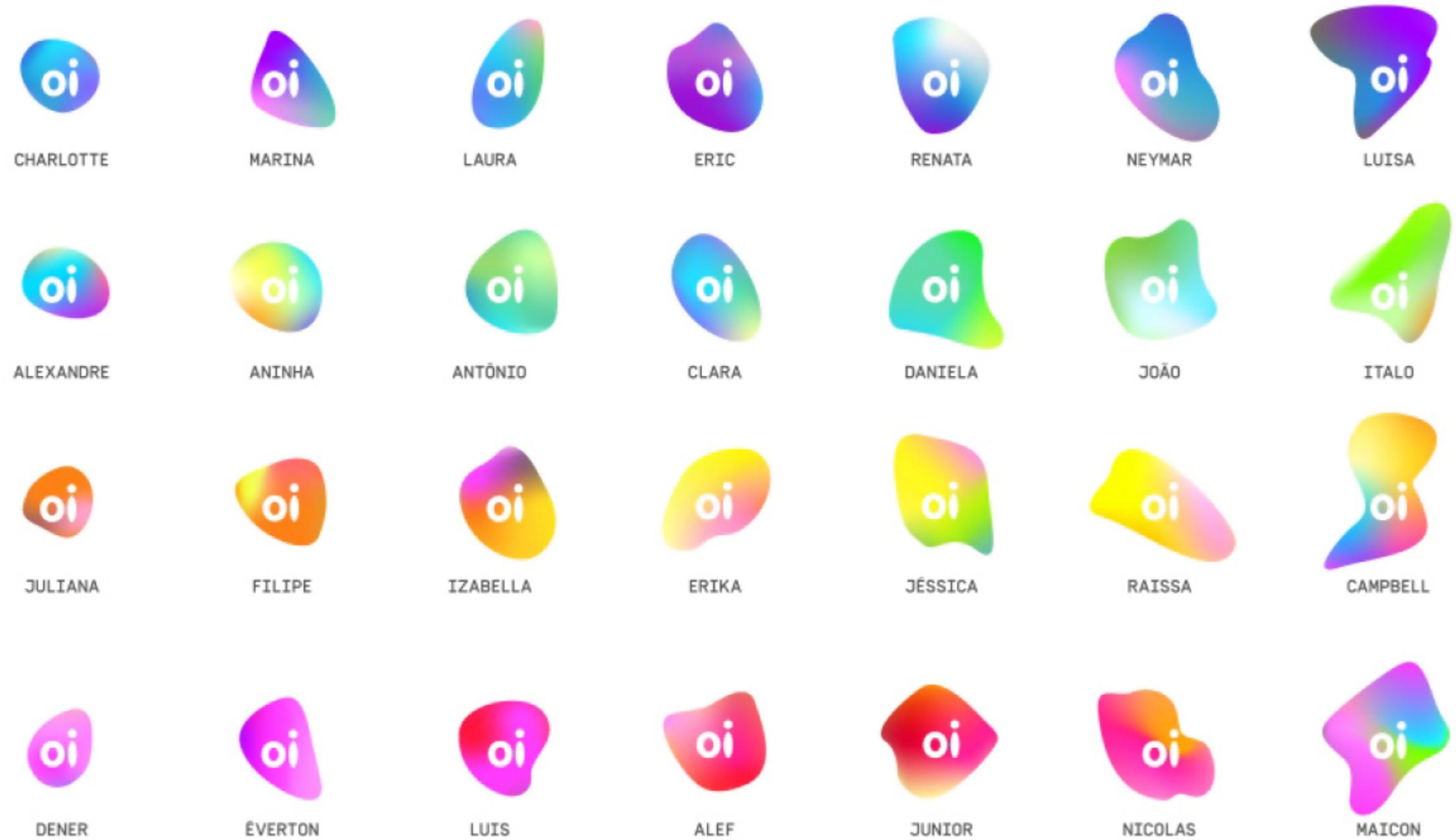
# Parametric Design – Introduction

# Applied Parametric Design



Quelle:esono.com/boris

# Applied Parametric Design



Source: [Onformative](#)

# Applied Parametric Design



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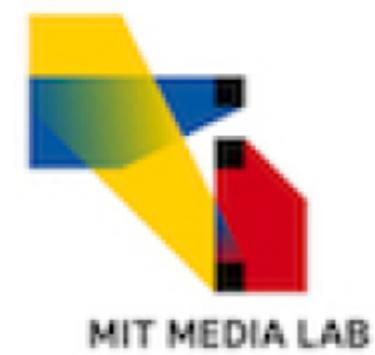
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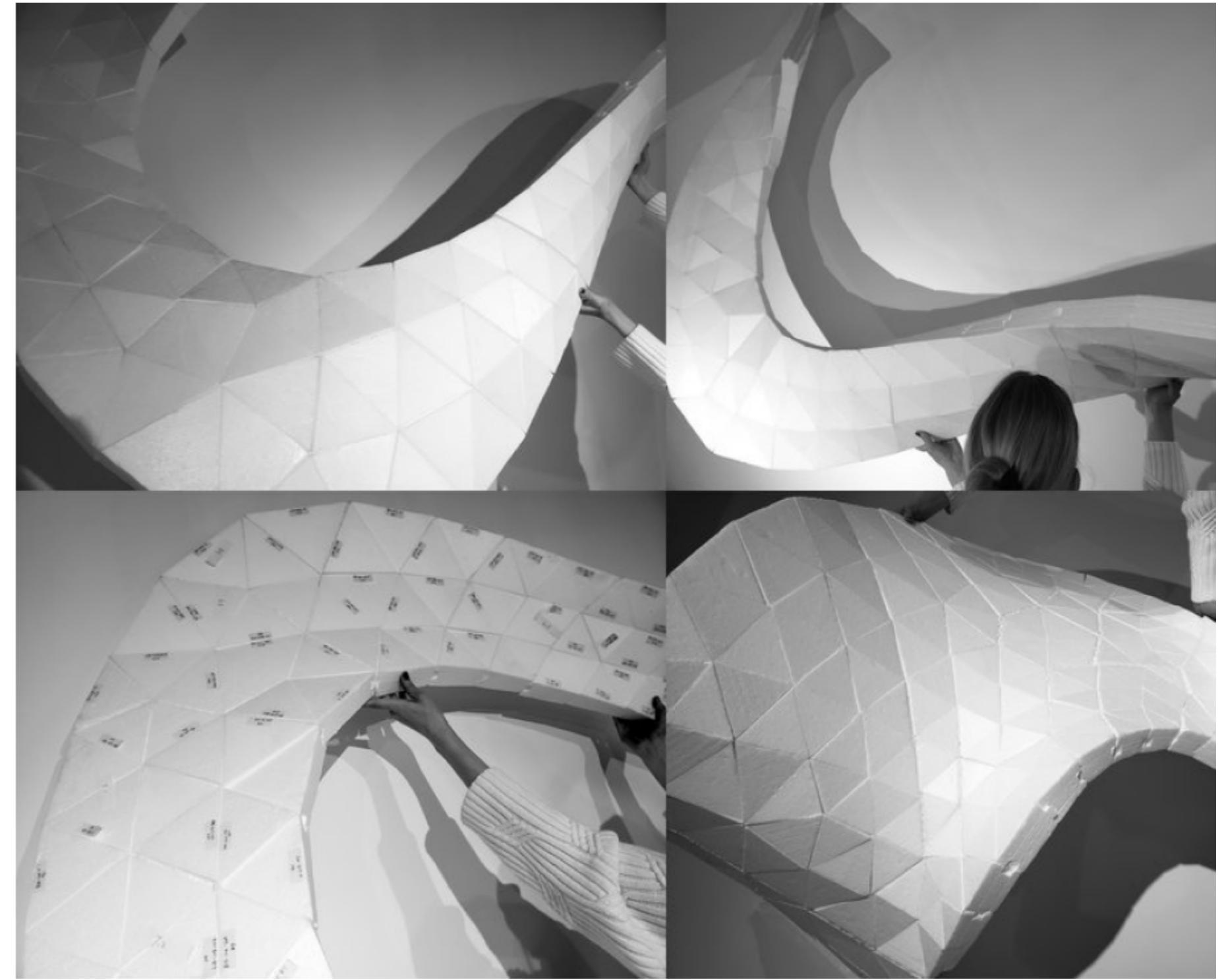
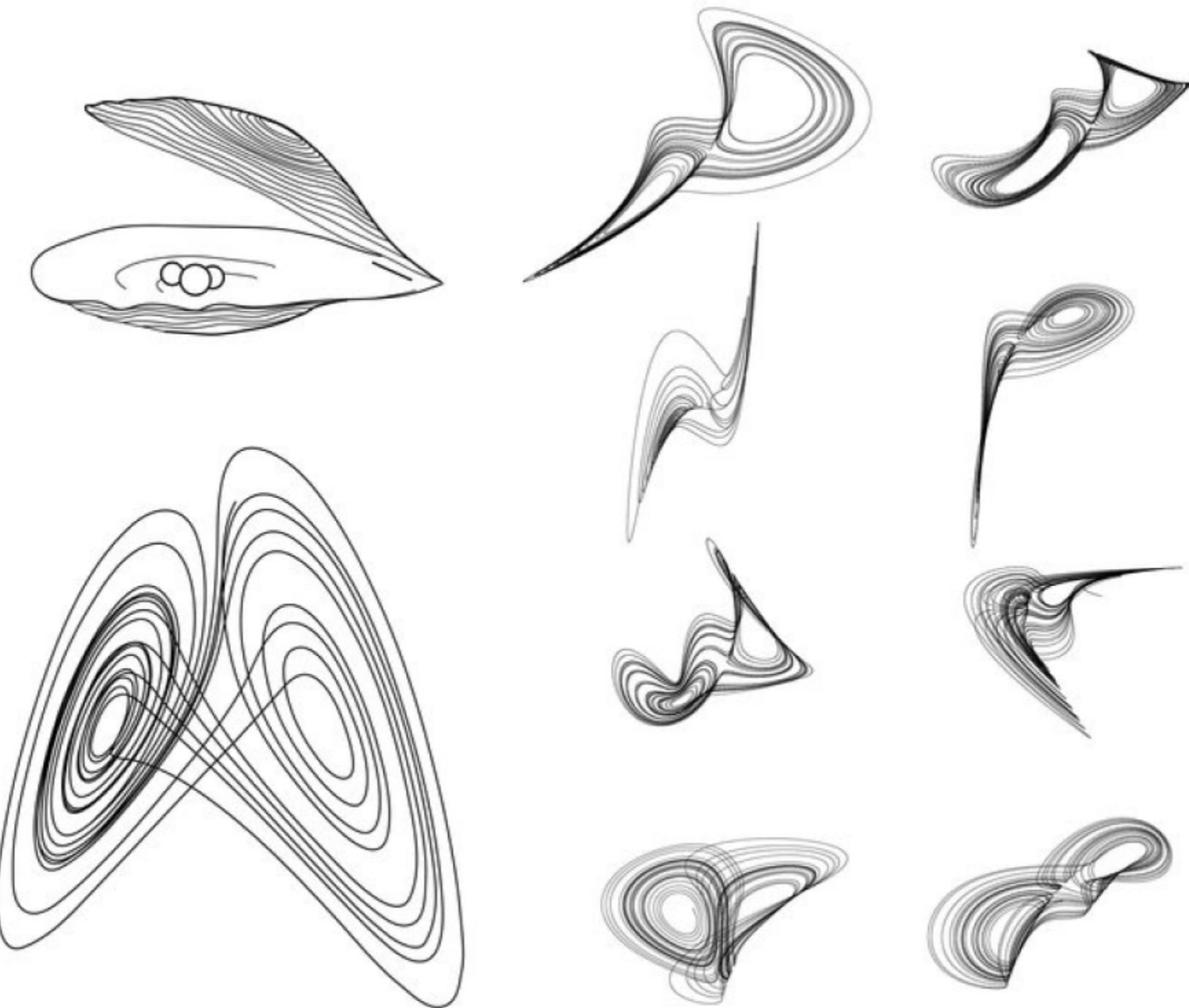
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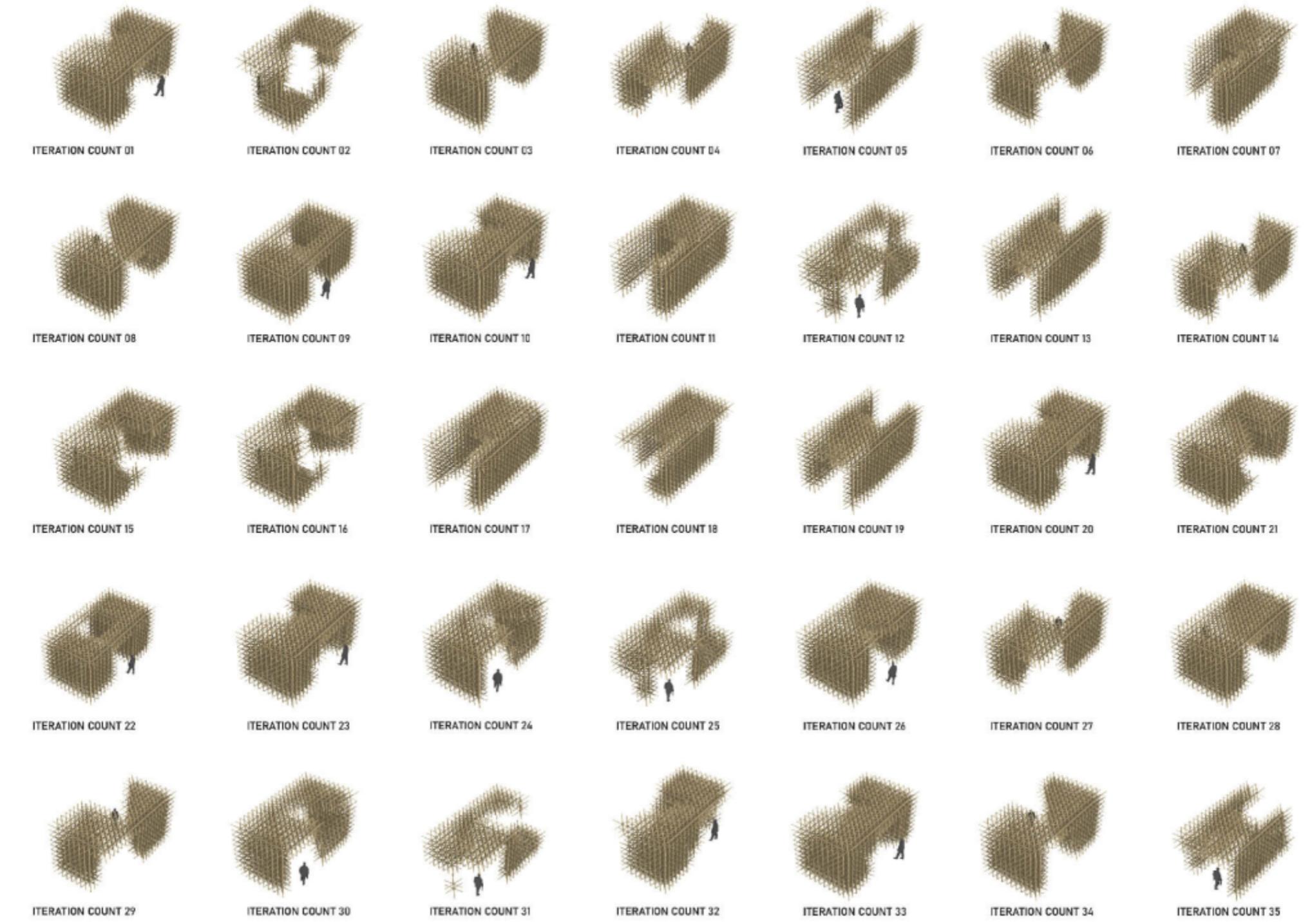
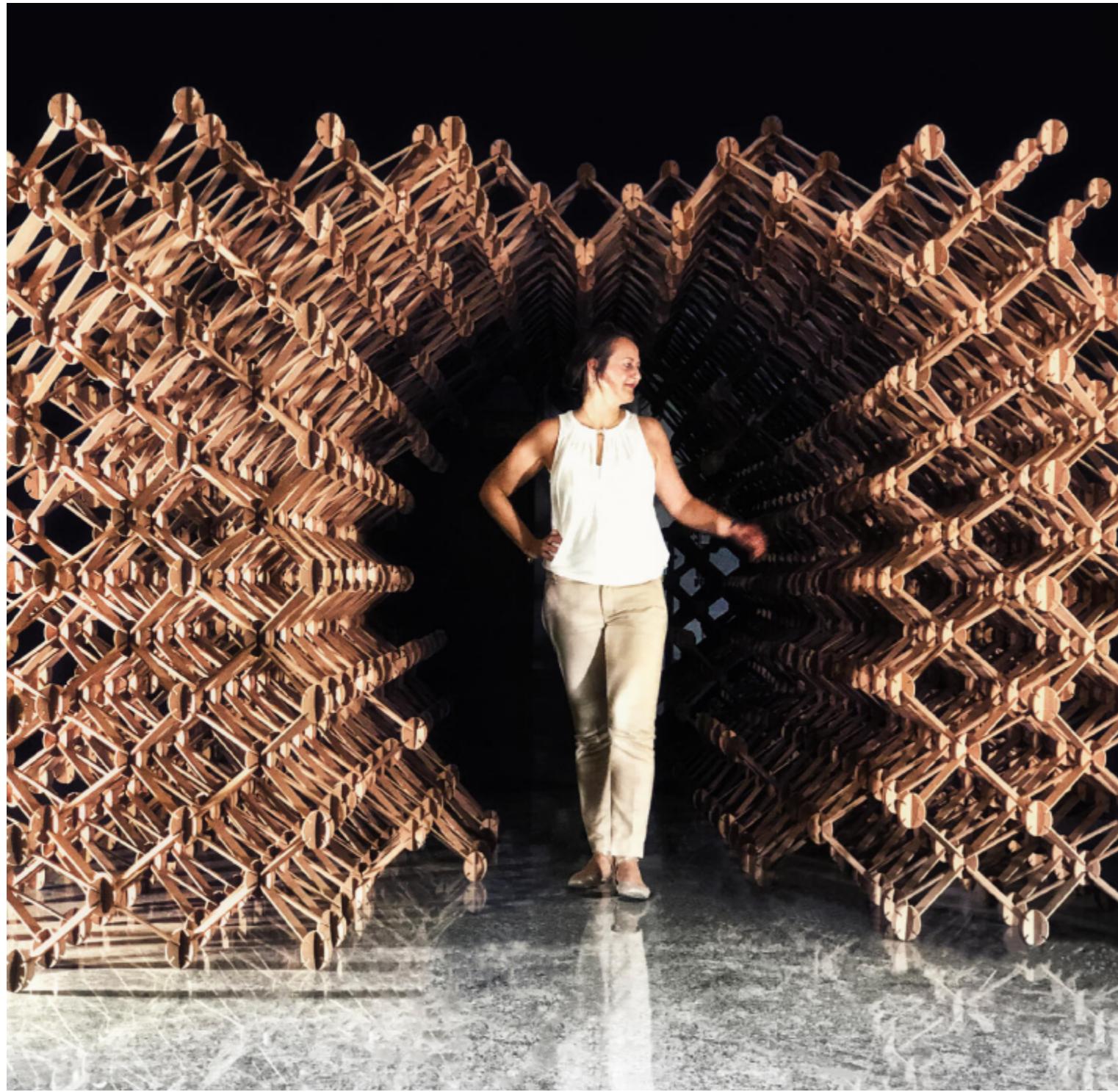
Source: [Information+](#)

# Applied Parametric Design



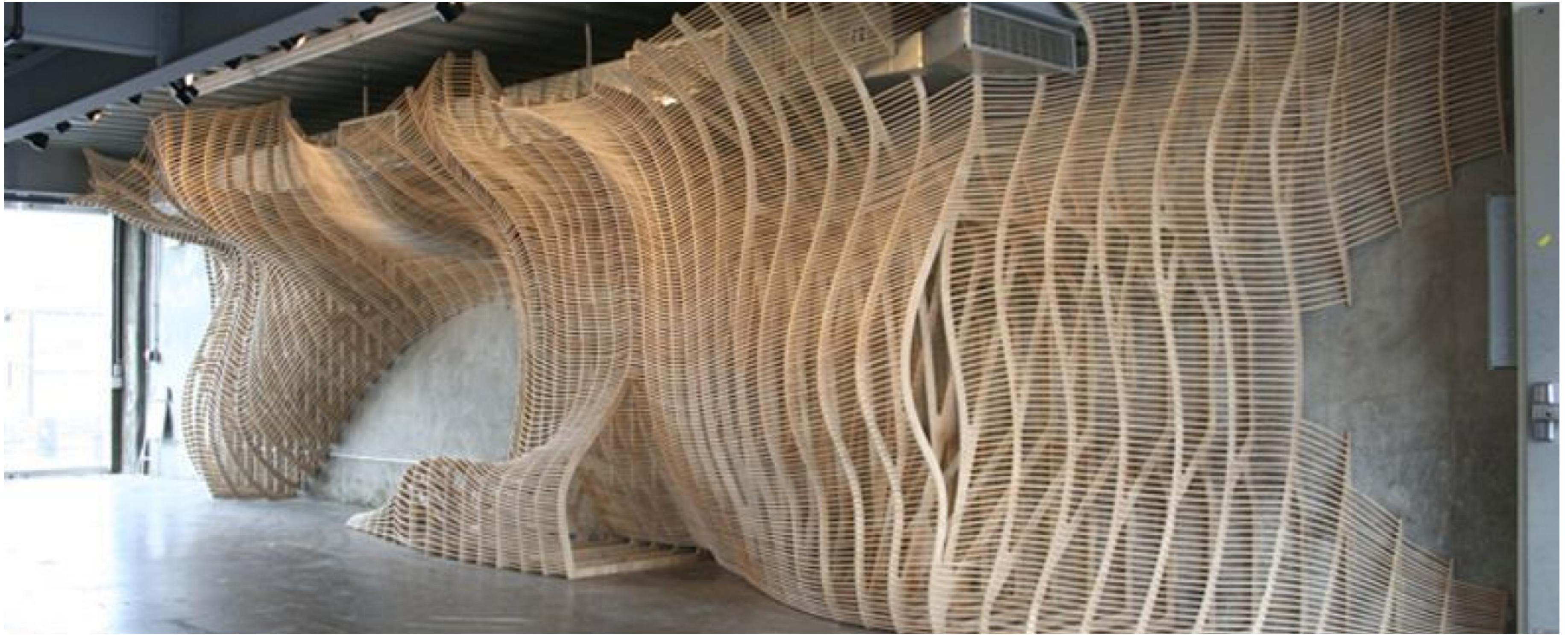
Source: [Fischer et al 2019](#)

# Applied Parametric Design



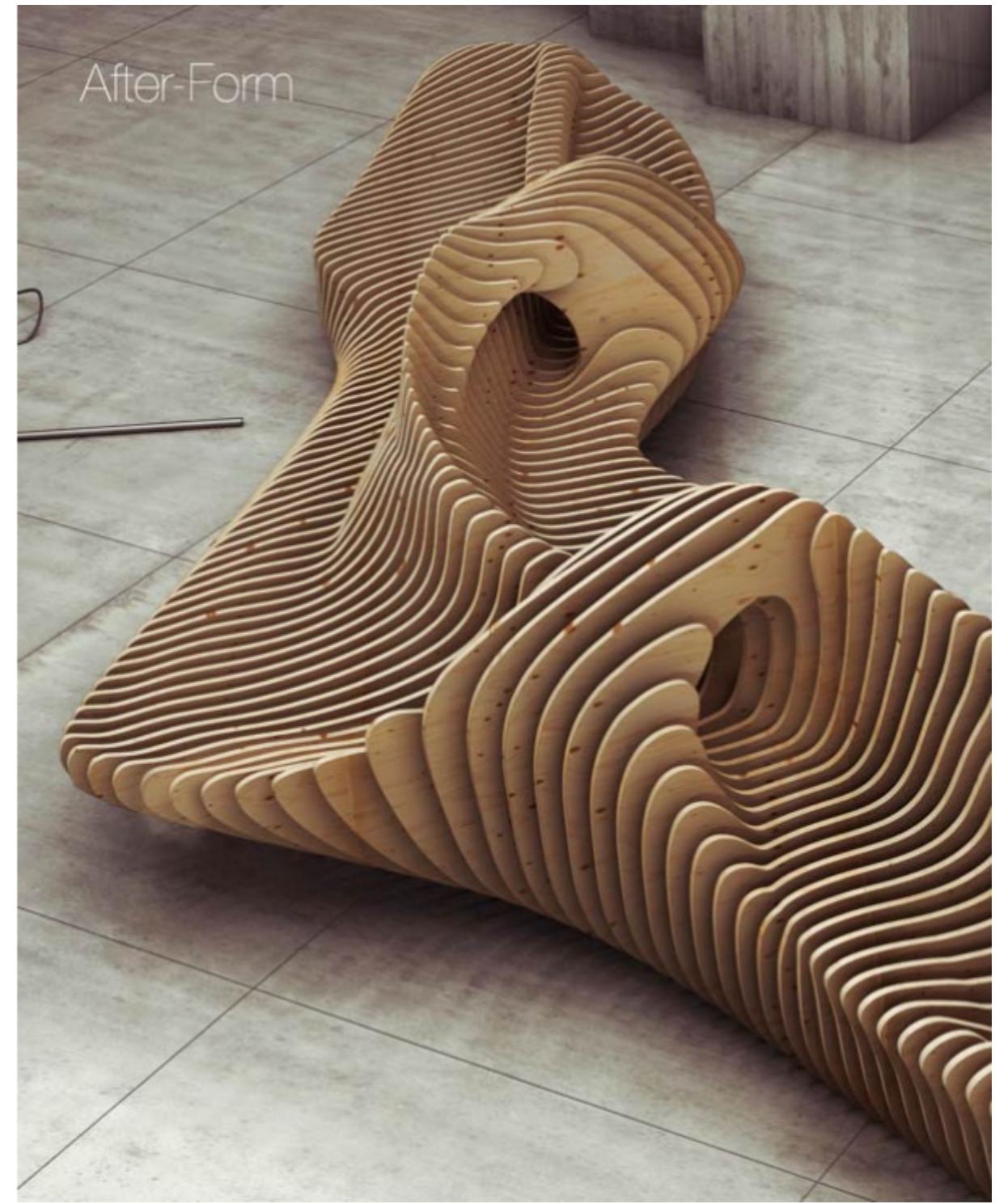
Source: [Studio Symbiosis](#)

# Applied Parametric Design



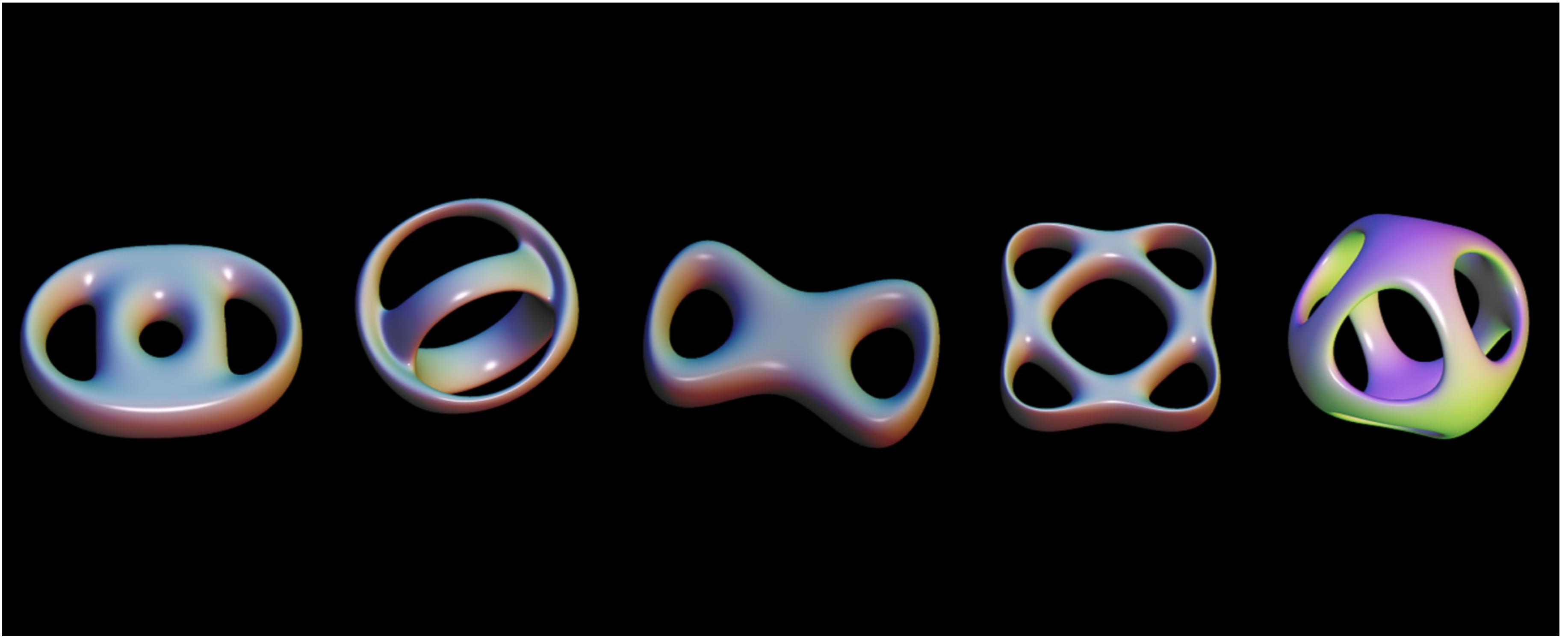
Source: [Laminar Flow](#)

# Applied Parametric Design



Source: [Oleg Soroko](#)

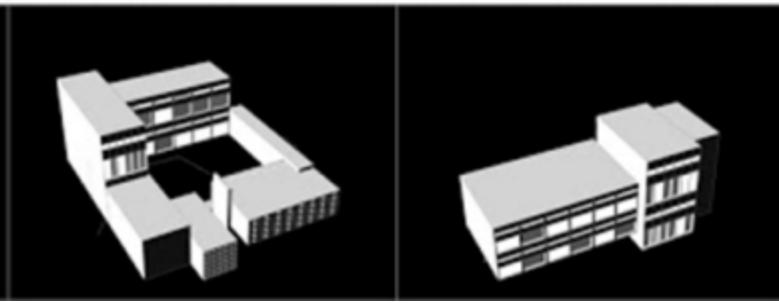
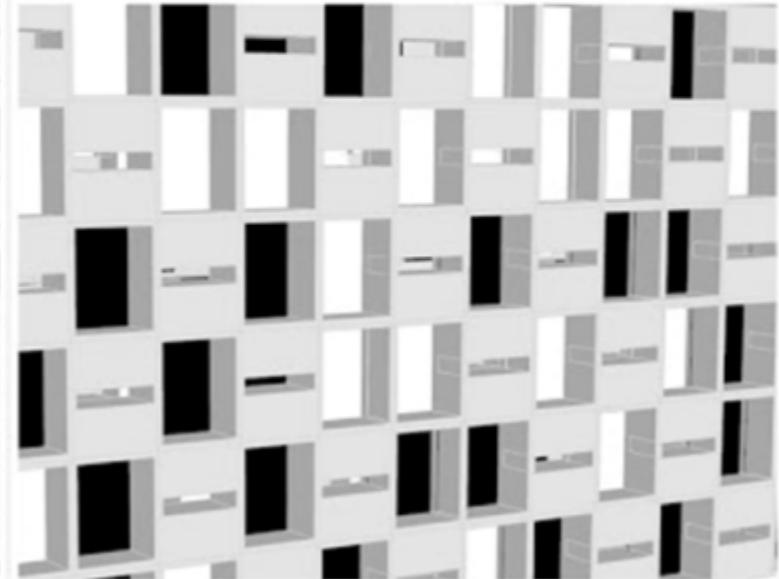
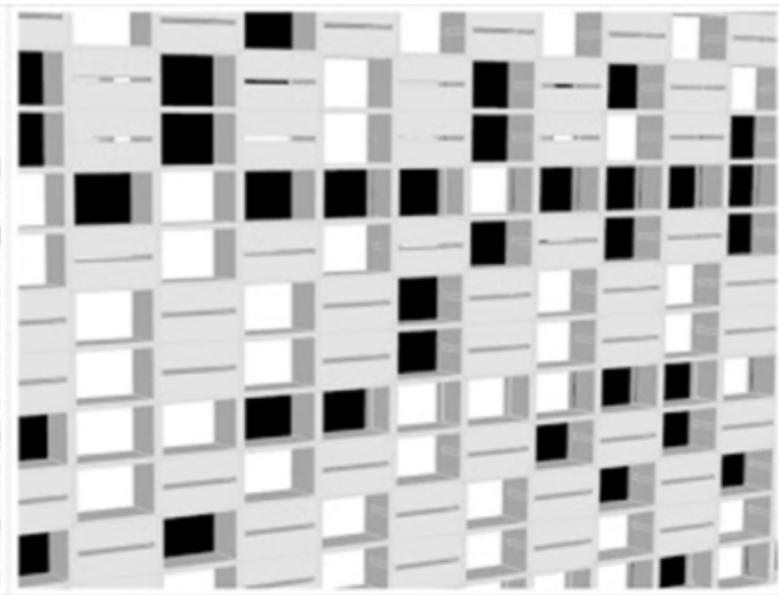
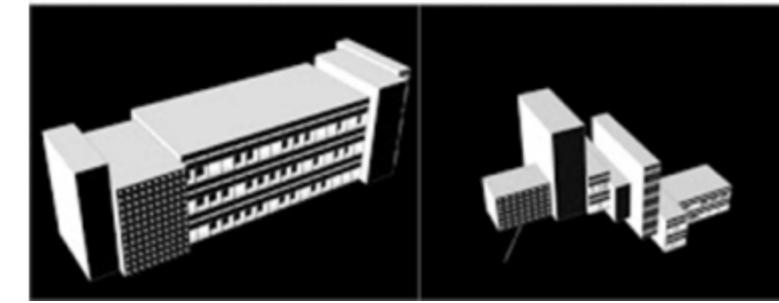
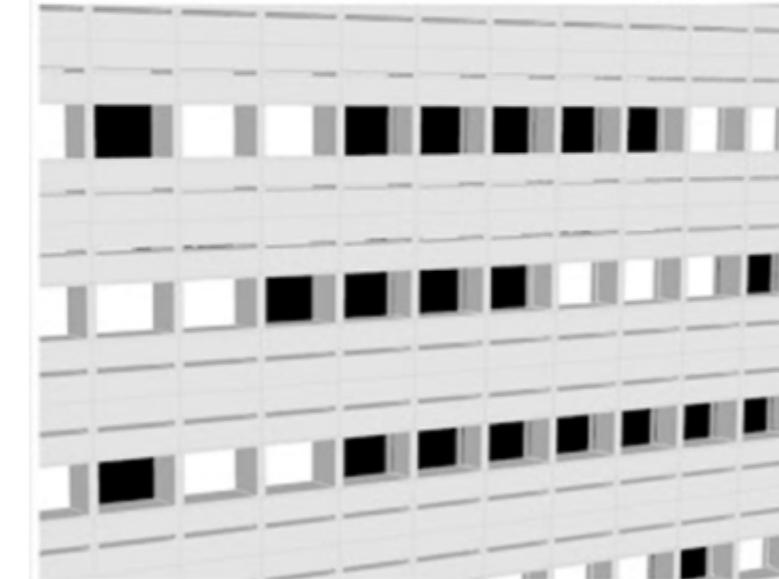
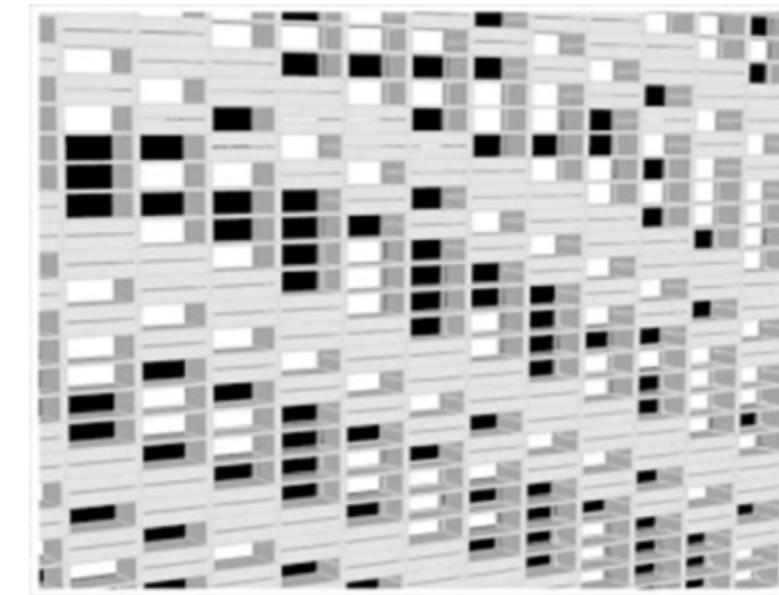
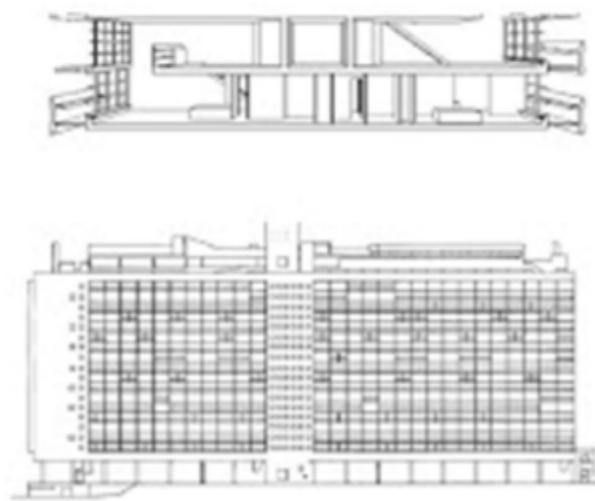
# Applied Parametric Design



Source: Virtual Math Museum

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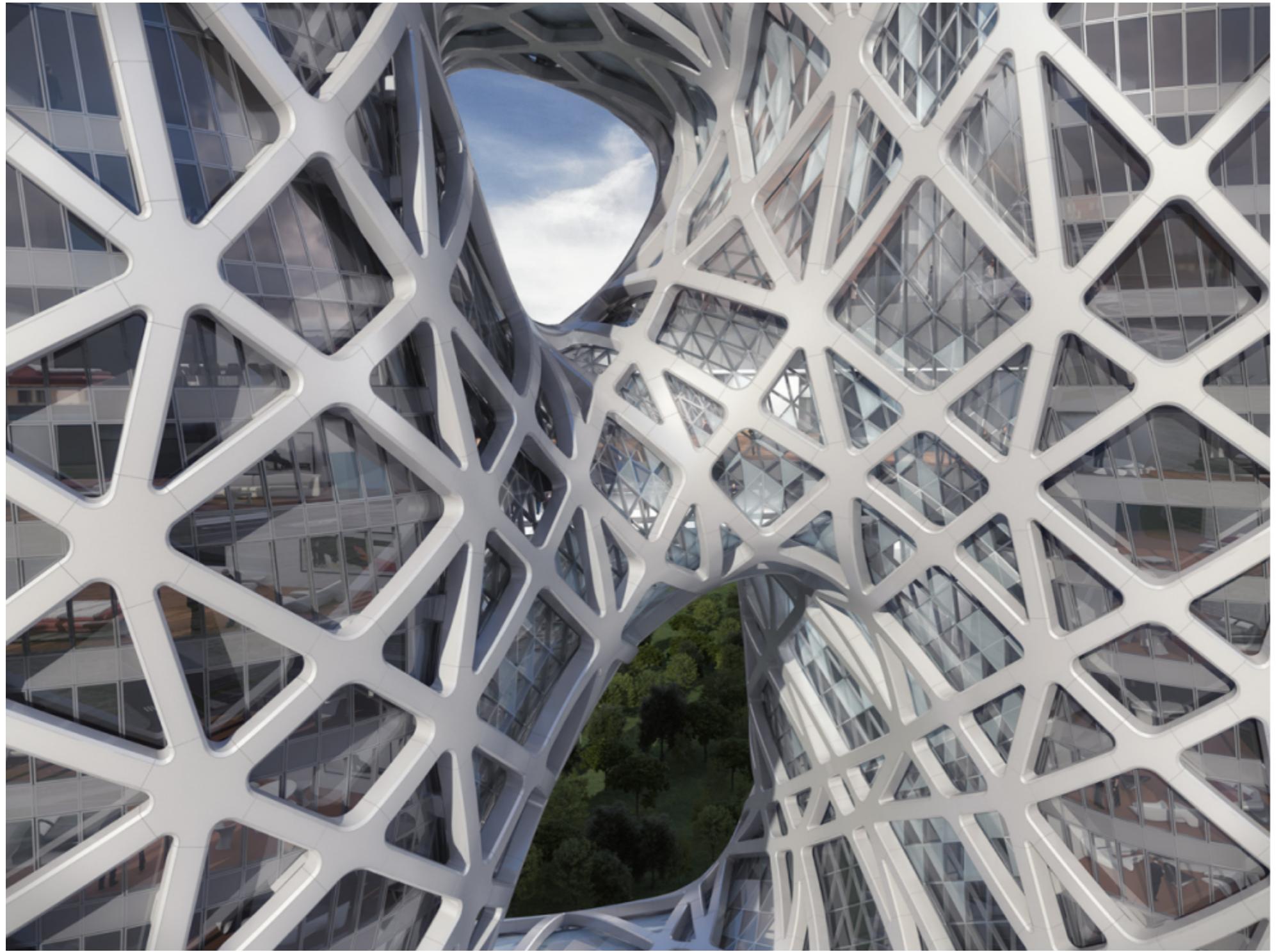
# Applied Parametric Design



Source: [Parametric Design Blog](#)

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# Applied Parametric Design



Source: [Parametric Design Blog](#)

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# Applied Parametric Design



Source: [IGS Mag](#)

# Applied Parametric Design



Source: [Parametric House](#)

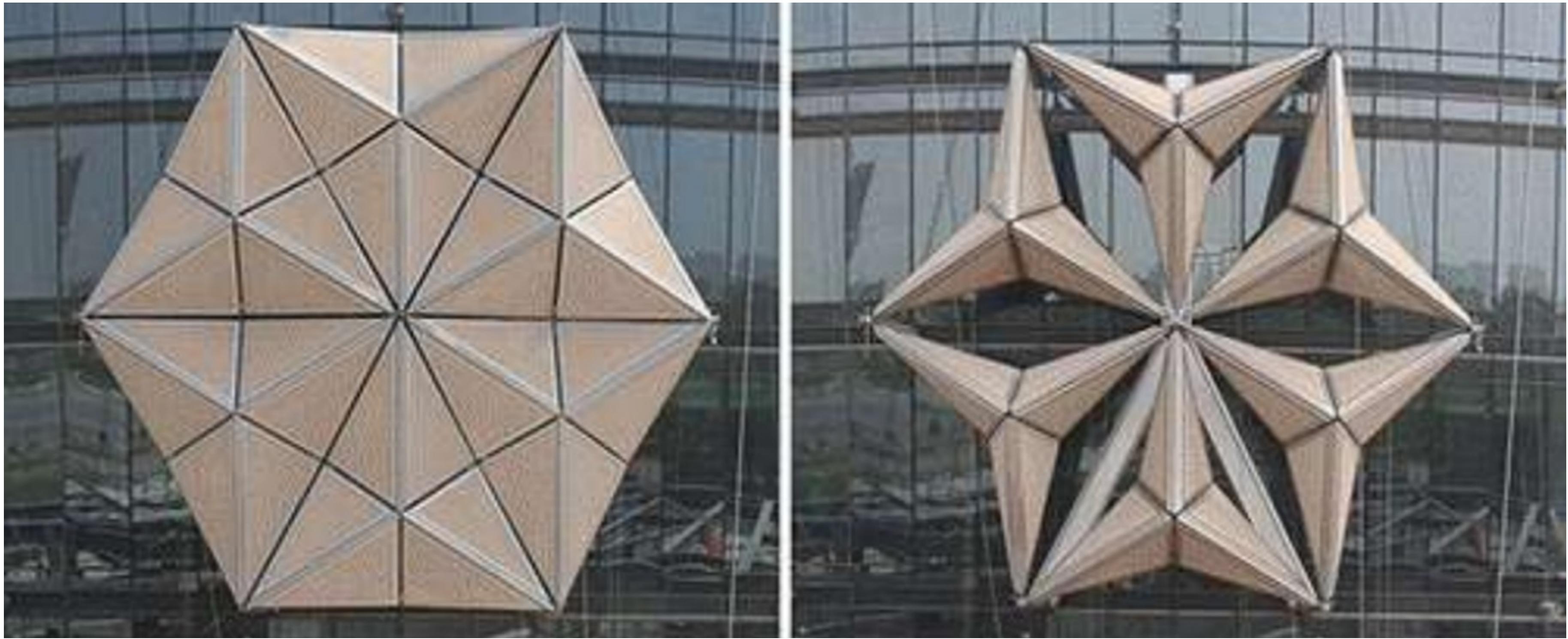
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# Applied Parametric Design



Source: [ArchiExpo](#)

# Applied Parametric Design



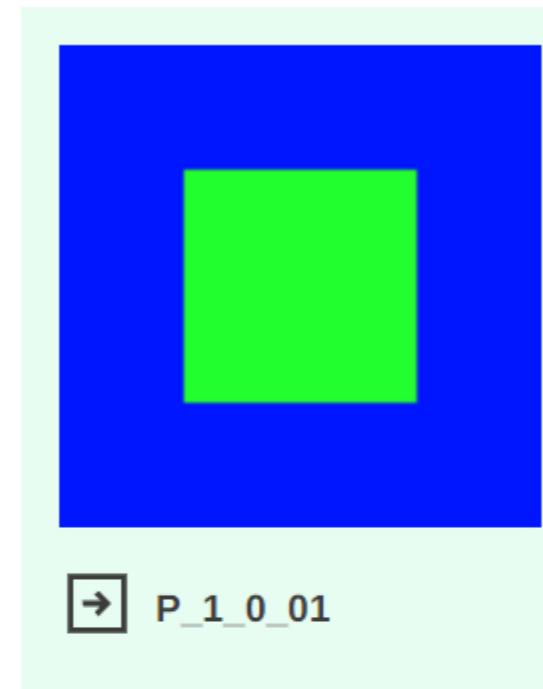
Source: [CityOfSound](#)

# Applied Parametric Design



Source: [SlideShare](#)

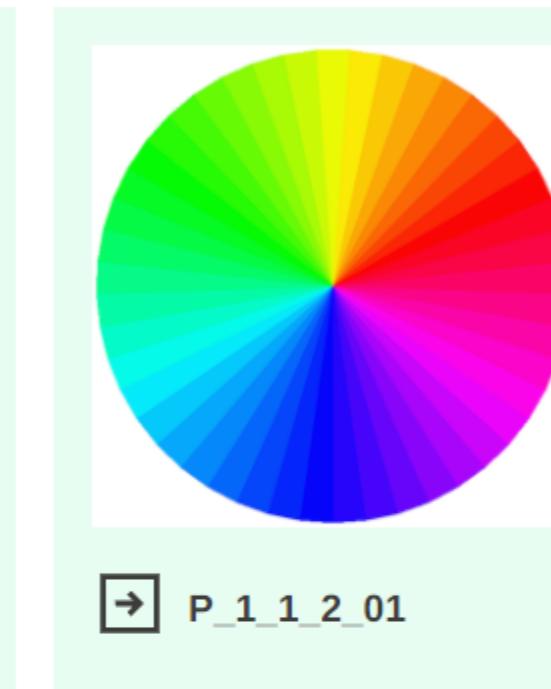
# Applied Parametric Design



→ P\_1\_0\_01



→ P\_1\_1\_1\_01



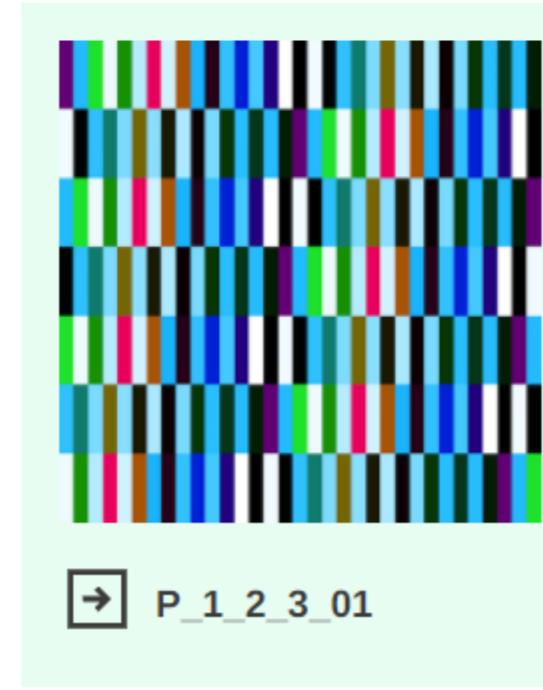
→ P\_1\_1\_2\_01



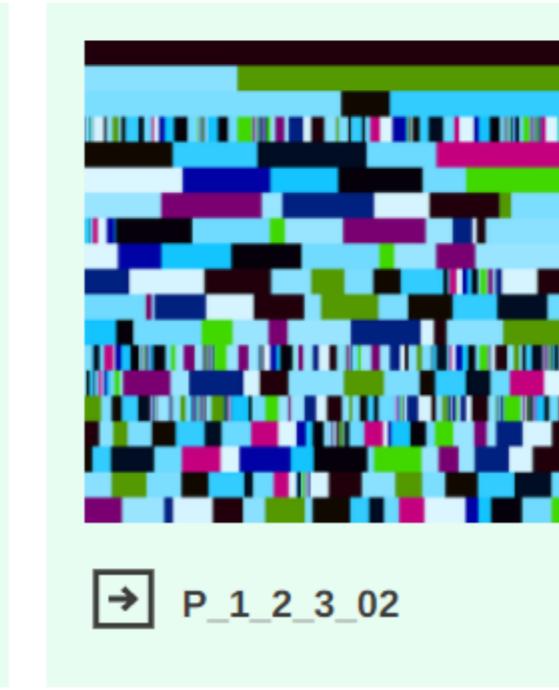
→ P\_1\_2\_1\_01



→ P\_1\_2\_2\_01



→ P\_1\_2\_3\_01



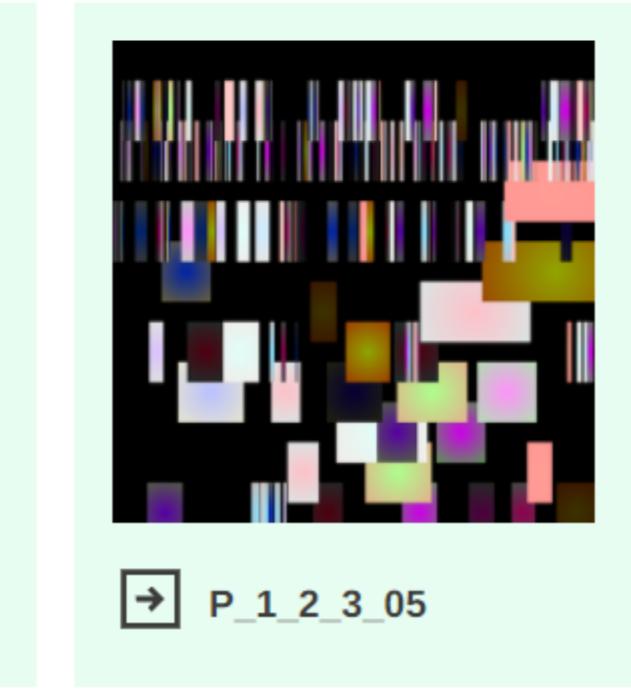
→ P\_1\_2\_3\_02



→ P\_1\_2\_3\_03

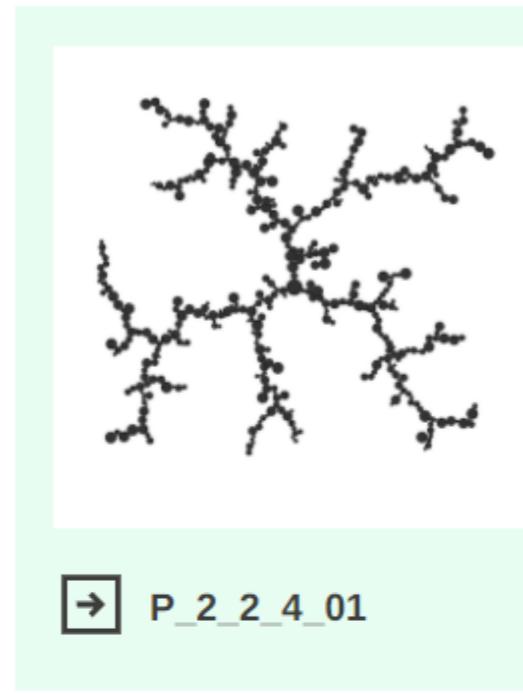


→ P\_1\_2\_3\_04

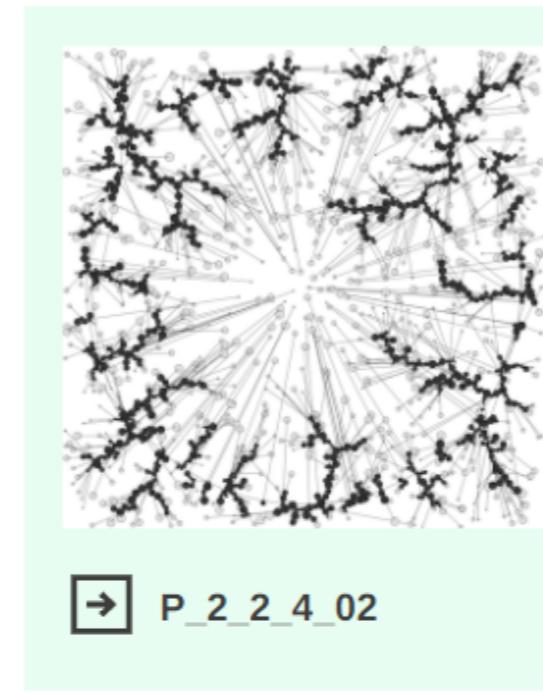


→ P\_1\_2\_3\_05

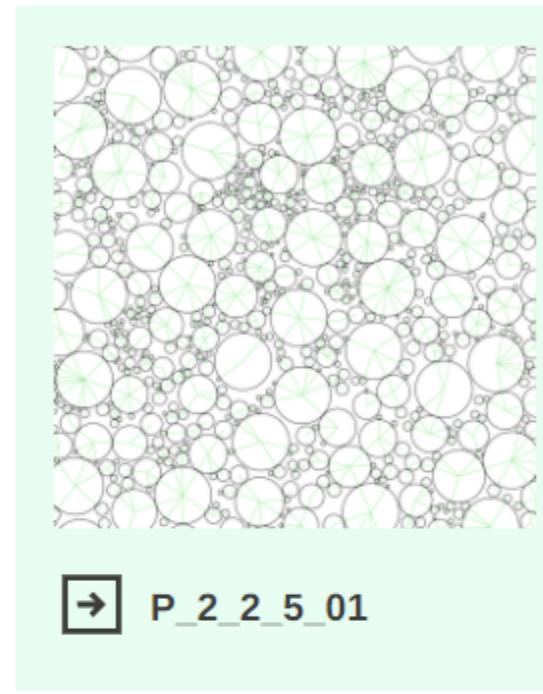
# Applied Parametric Design



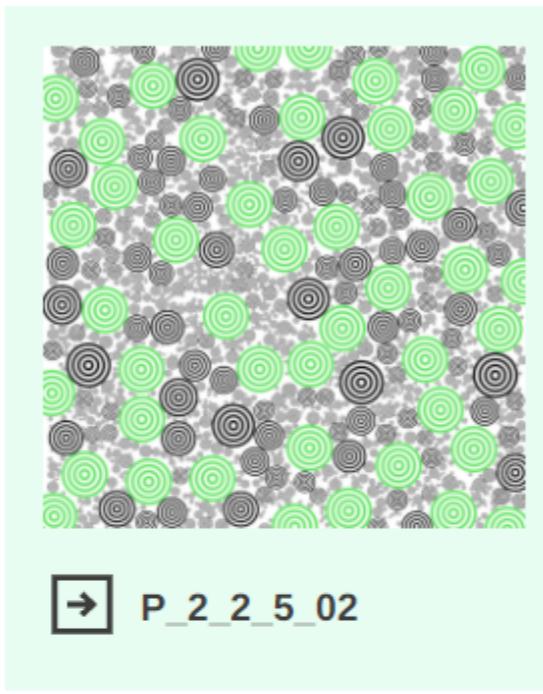
→ P\_2\_2\_4\_01



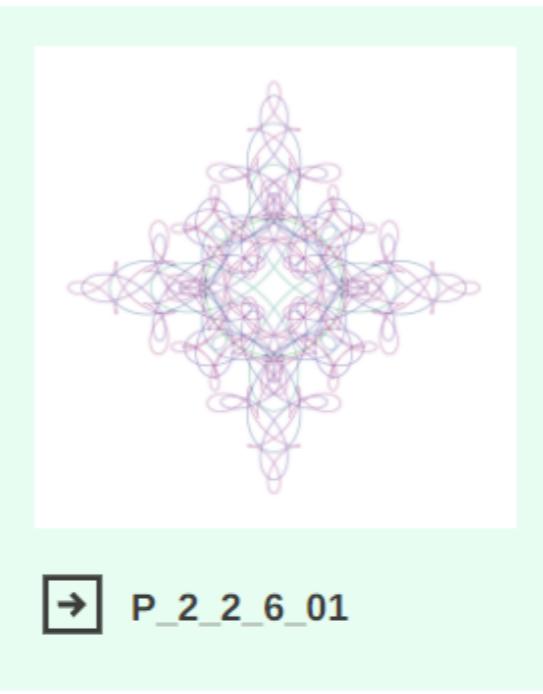
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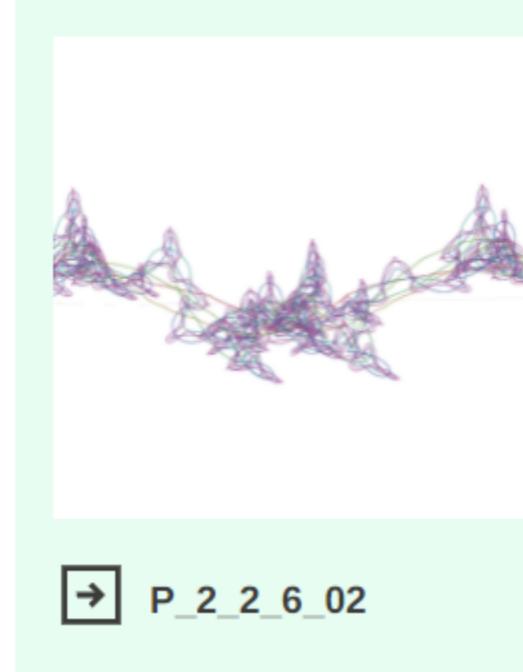
→ P\_2\_2\_5\_01



→ P\_2\_2\_5\_02



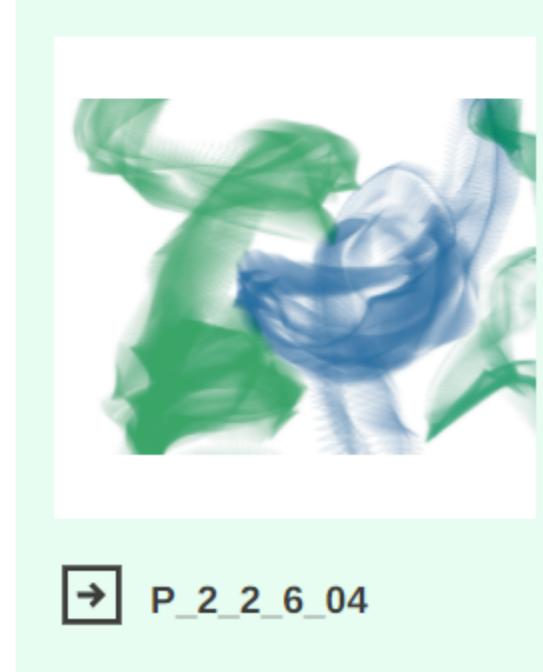
→ P\_2\_2\_6\_01



→ P\_2\_2\_6\_02



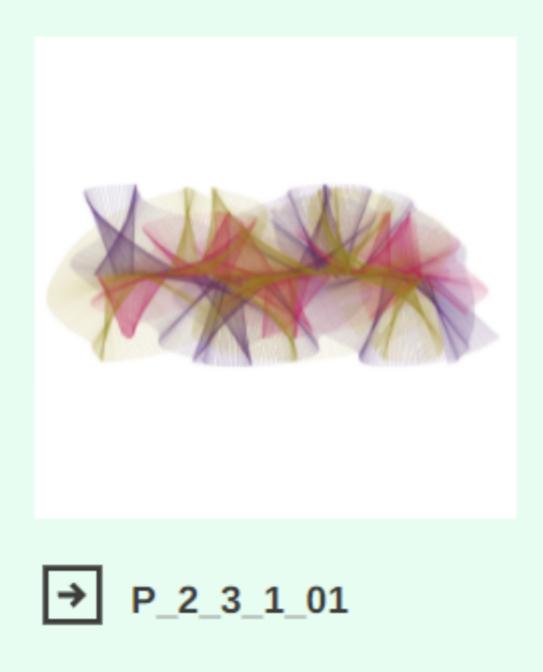
→ P\_2\_2\_6\_03



→ P\_2\_2\_6\_04

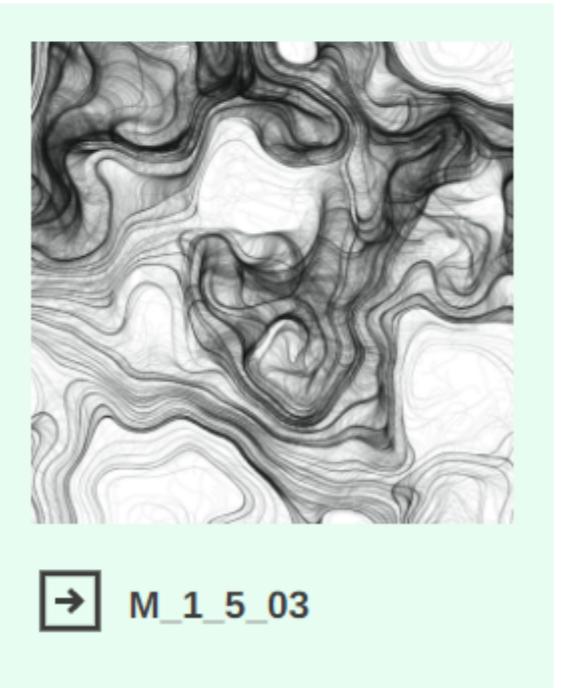
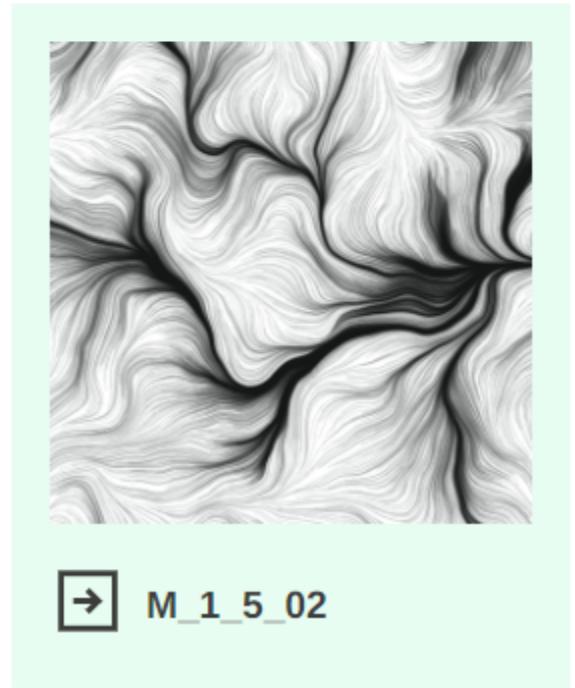
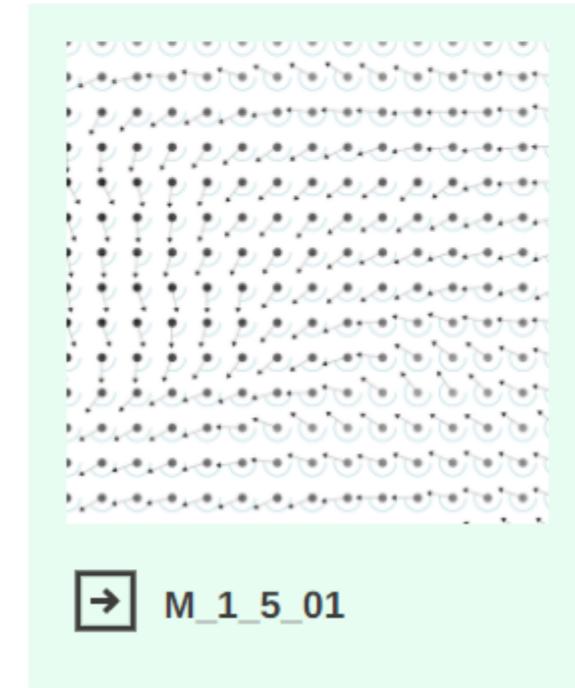
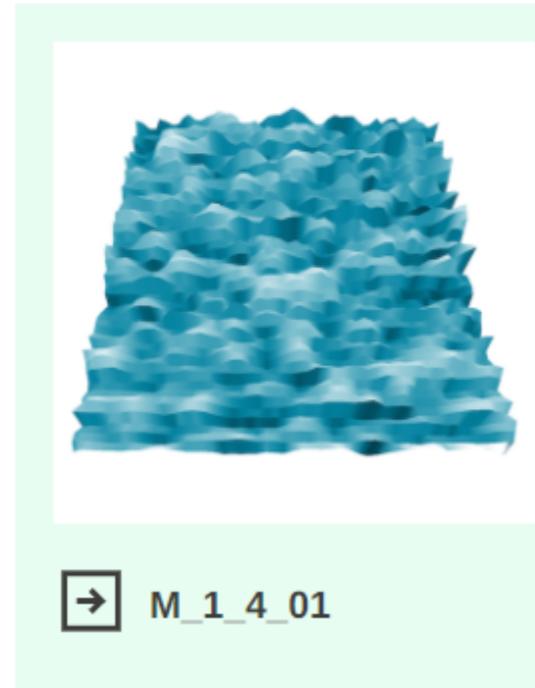
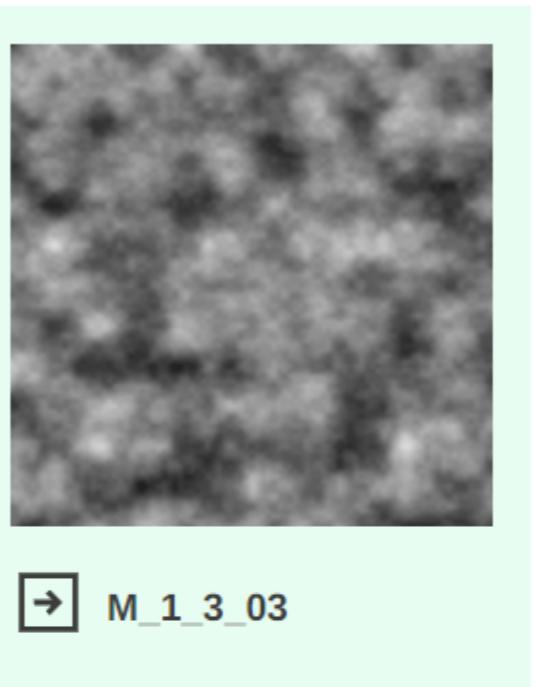
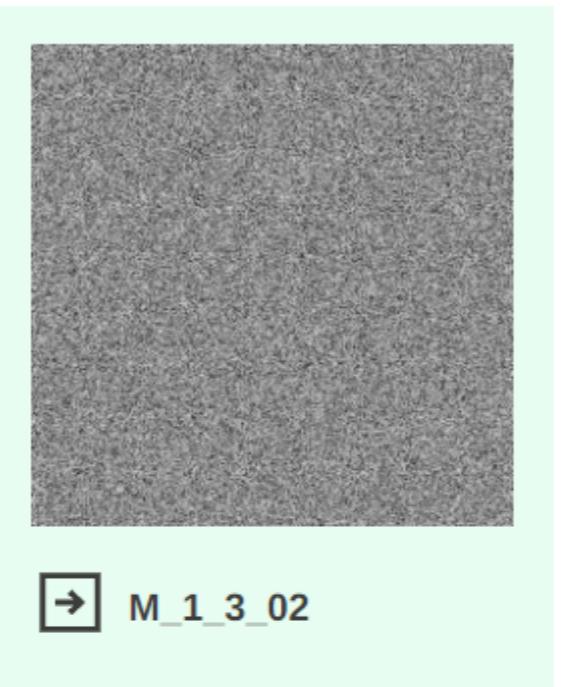
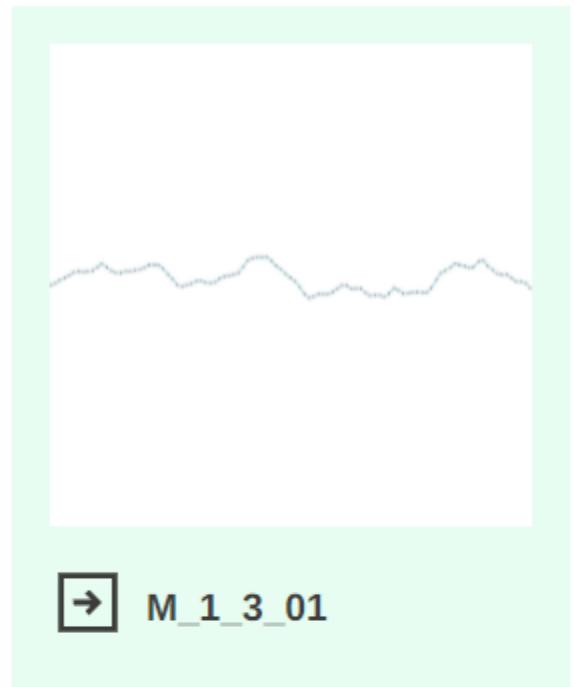
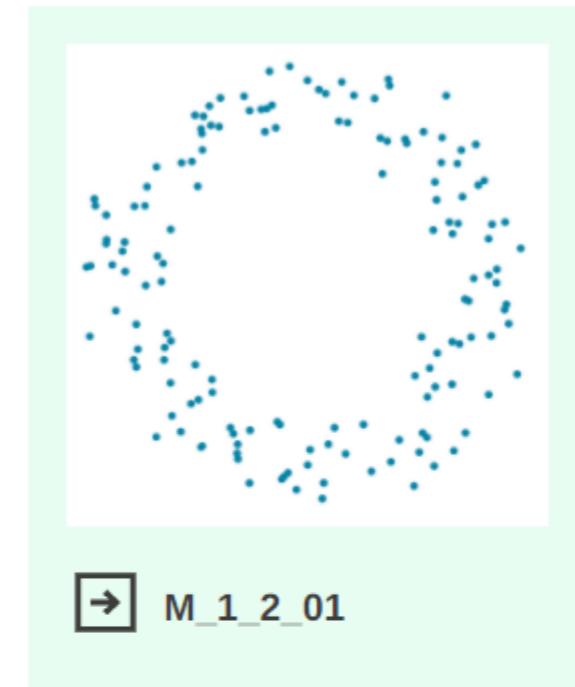
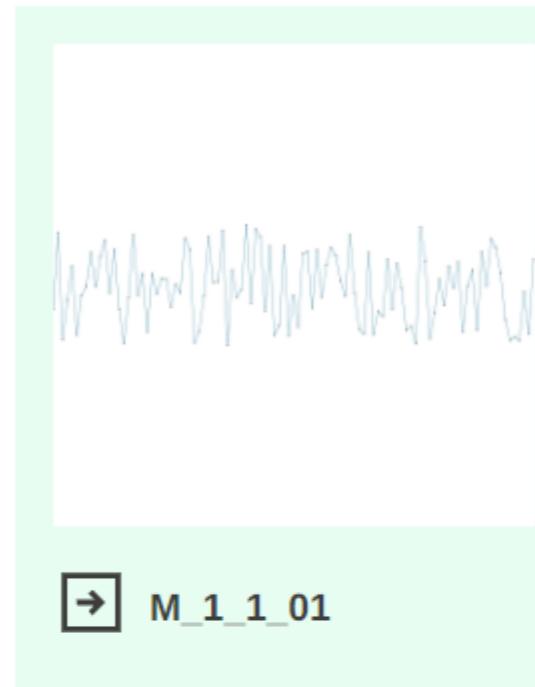


→ P\_2\_2\_6\_05



→ P\_2\_3\_1\_01

# Applied Parametric Design



Source: [Generative Gestaltung](#)

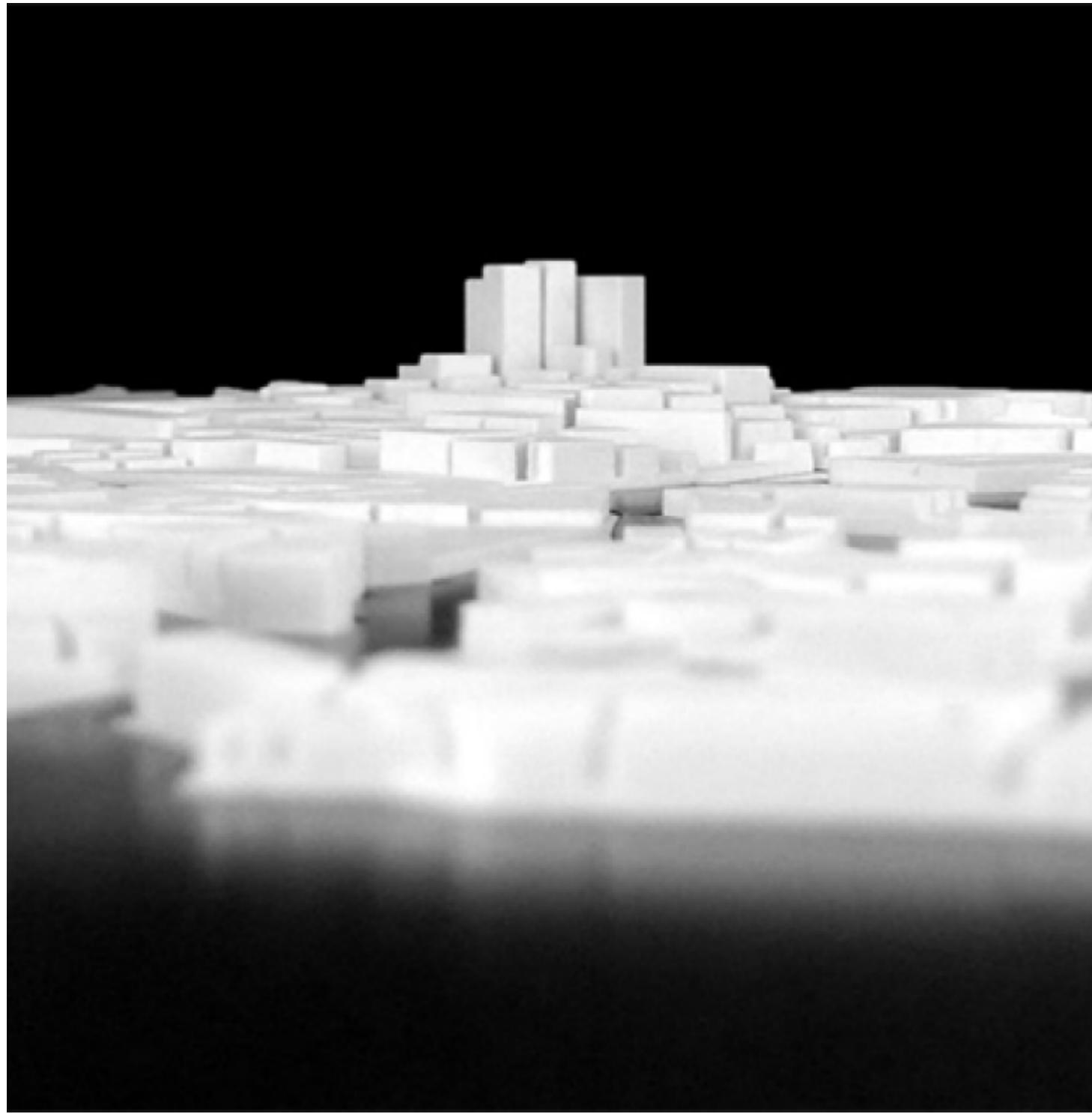
# Applied Parametric Design



Source: VISLAB

## Parametric Design – Introduction

# Applied Parametric Design



**Psychogeography in the age of the quantified self**  
The metamorphosis of cartographic representations through personal activity data  
Sebastian Wern, Karlsruhe Institute of Applied Sciences Potsdam, Germany - 2016

**Abstract**

Subjective perceptions of urban space have been in the focus of various research projects and act as a recurring reference in urban practice, no less since the French theorist and international cultural theorist Guy Debord in the 1960s in "The study of the specific effects of the geographical environment (behavior, consciously organized or not) on the emotions and behavior of individuals" (Debord, 1969). The main premise of this definition remains relevant today, since each of us perceives their environment in a personal and different way, depending on past experiences and how we make use of urban spaces. Adding to this, practices of self-tracking in the age of the quantified self have created another type of spatial perception in the form of personal movement data and device-based orientation. Through this artwork, we subject a data-driven representation of urban geography to an artistic and aesthetic interpretation. With this, we do not claim to provide a seemingly objective embodiment of allegedly omnipotent movements of the self. Quite the contrary, we emphasize the distinction between (nominally) quantitative, objective data and subjective, personal experiences of space. Based on the assumption that our memory of the urban infrastructure is among other things strongly influenced by how we navigate the world (e.g. mode of transportation), we built an algorithm that aggregates personal activity data (GPS trajectories) and creates an individual city model based upon a series of movement analysis. Thus, the resulting visual and physical model represent a personal perspective on the city. These individual representations generated by the algorithm can be perceived as discursive artifacts, which can help to better understand and reflect subjective views and experiences of the urban infrastructure.

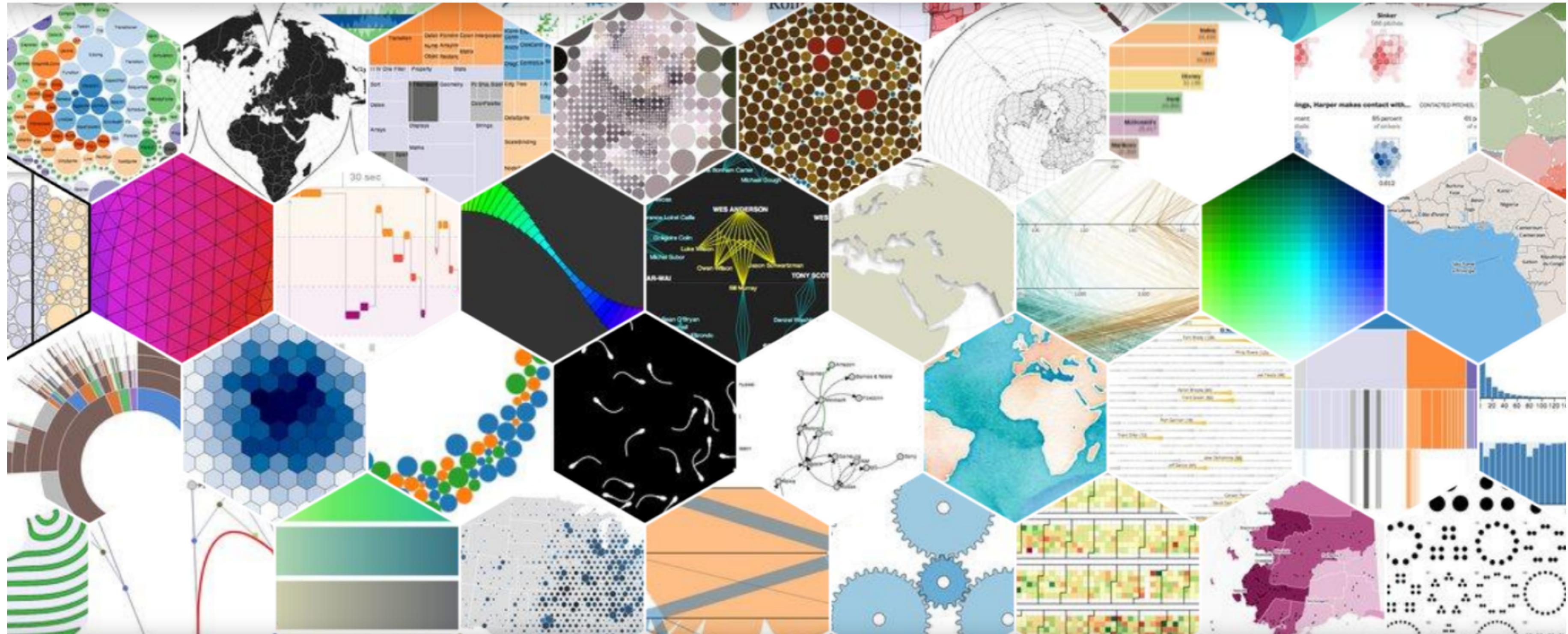
**Keywords**

VISLAB.de IDL Interaction Design Lab University of Applied Sciences Potsdam

Source: VISLAB

# Parametric Design – Introduction

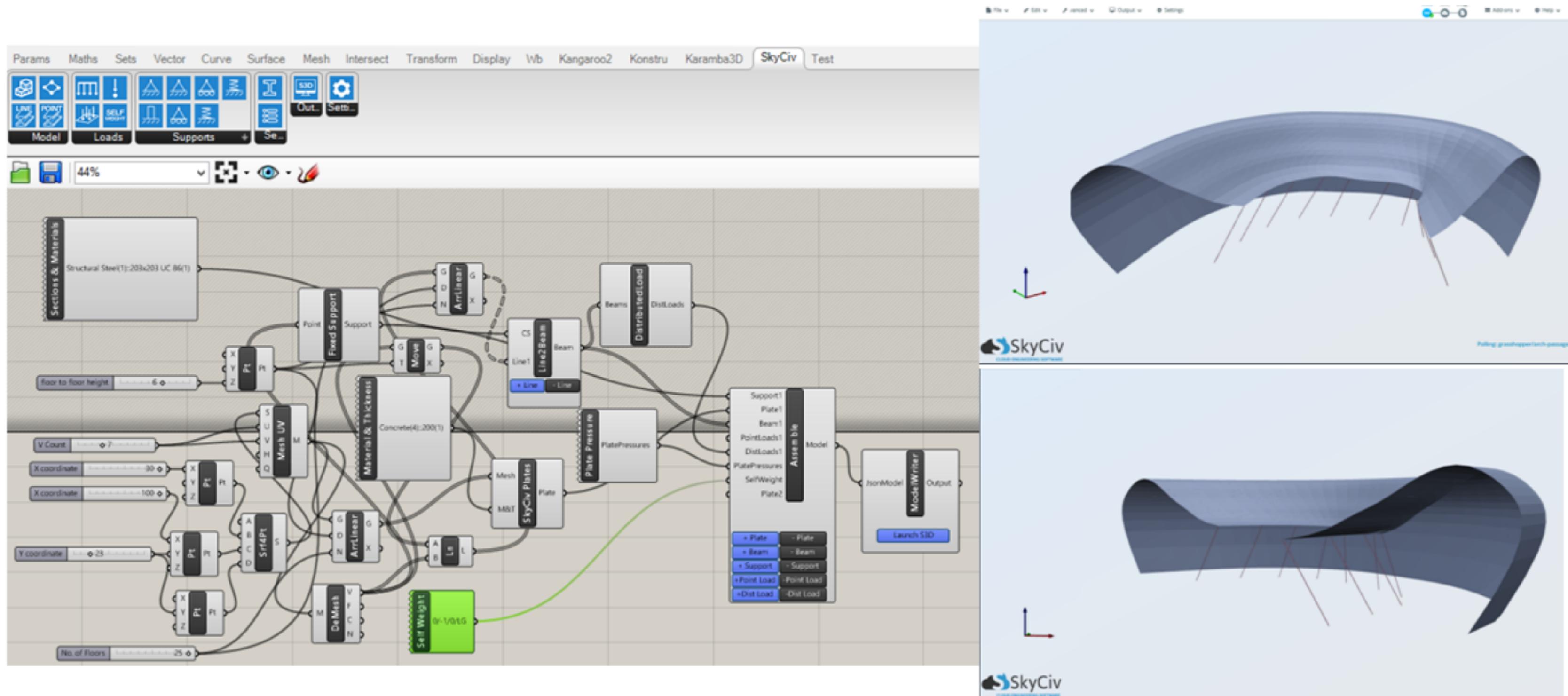
## Next Steps



Source: [D3js](#)

# Parametric Design – Introduction

## Next Steps



Source: [Rhino3D Blog](#)

Parametric Design

# #01 – Introduction

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