



EMERGING PATTERNS

INDEXLAB
CREATIVITY & TECHNOLOGY



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Deutsch-Italienische
Handelskammer
Camera di Commercio
Italo-Germanica



The diagram features a central text block for 'POLITECNICO MILANO 1863' and 'INDEX LAB'. This central block is surrounded by three dashed teal lines that form a triangular shape. Each line connects to one of the three surrounding text blocks: 'ACADEMIC INSTITUTIONS' at the top, 'PROFESSIONAL OFFICES' at the bottom left, and 'INDUSTRY and MANUFACTURING' at the bottom right. The background is white with several large, semi-transparent circles in shades of blue and teal.

ACADEMIC
INSTITUTIONS

POLITECNICO
MILANO 1863

INDEX LAB

PROFESSIONAL
OFFICES

INDUSTRY and
MANUFACTURING



CONTEMPORARY ARCHITECTURE



TOP-DOWN

FREE FORM

PROGRAM FOLLOWS FORM



BOTTOM-UP

PERFORMATIVE

FORM FOLLOWS EFFICIENCY

SHAPING FORM

PHYSICAL MODELING
REVERSE ENGINEERING
VIRTUAL MODELING

FINDING FORM

BACK AND FORTH ANALYSIS
ITERATIVE PROCESS

GENERATING FORM

VIRTUAL MODELING
DATA DRIVEN DESIGN
GENERATIVE ALGORITHMS

The background features several overlapping circles in various shades of teal and light blue. On the left, there is a large light teal circle partially obscured by a smaller medium teal circle. On the right, there is a large medium teal circle partially obscured by a smaller light blue circle. At the top right, there is a large light blue circle. The text is centered horizontally between the left and right clusters of circles.

NEW CONSTRUCTION SYSTEMS

Robotic assembly systems for free-form structures and claddings



Robotic assembly systems for free-form structures and claddings

Robotic assembly systems for free-form structures and claddings



Robotic assembly systems for free-form structures and claddings

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Robotic assembly systems for free-form structures and claddings

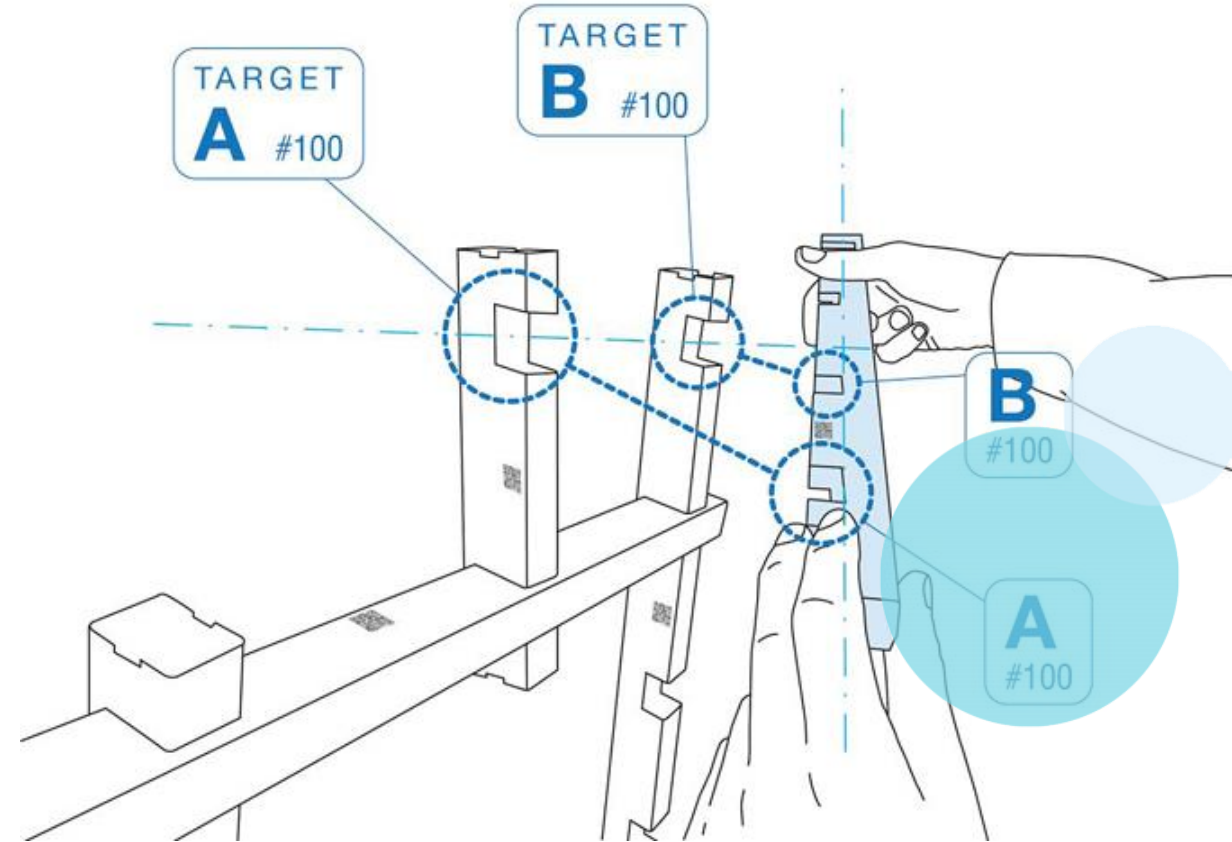


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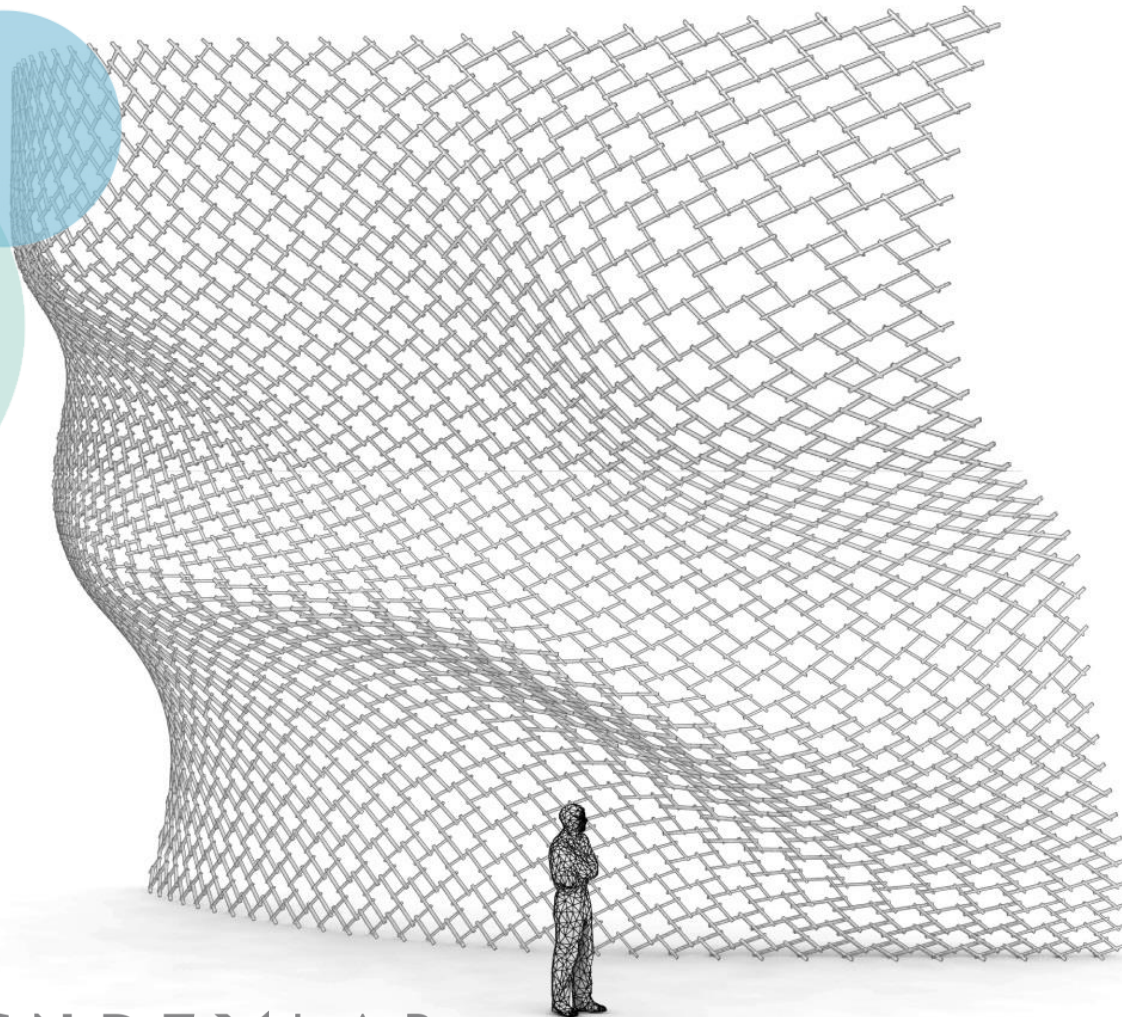
Reciprocal frame optimization systems for spatial structures

Reciprocal frame optimization systems for spatial structures

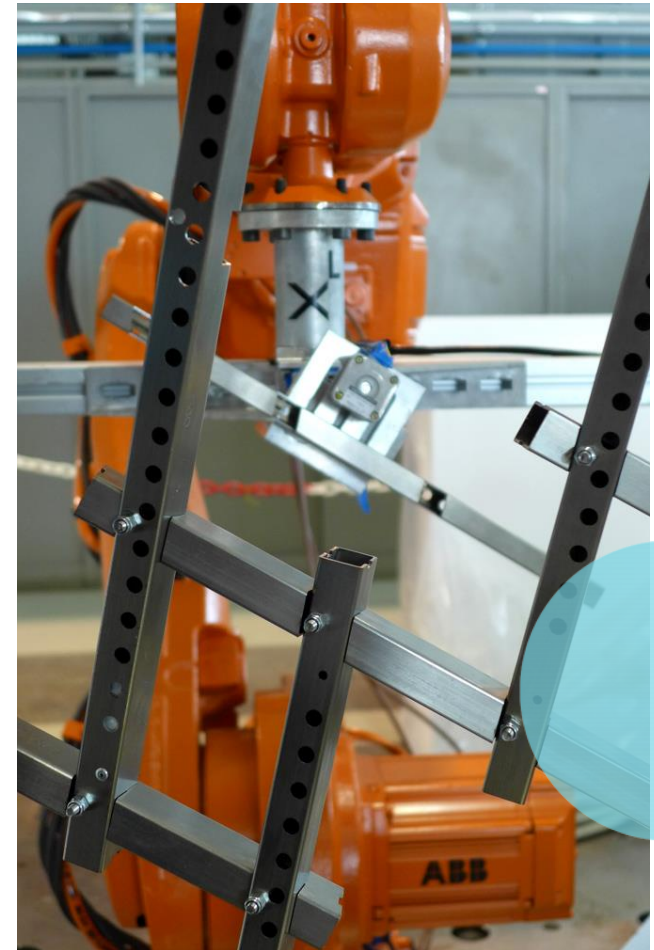


Reciprocal frame optimization systems for spatial structures

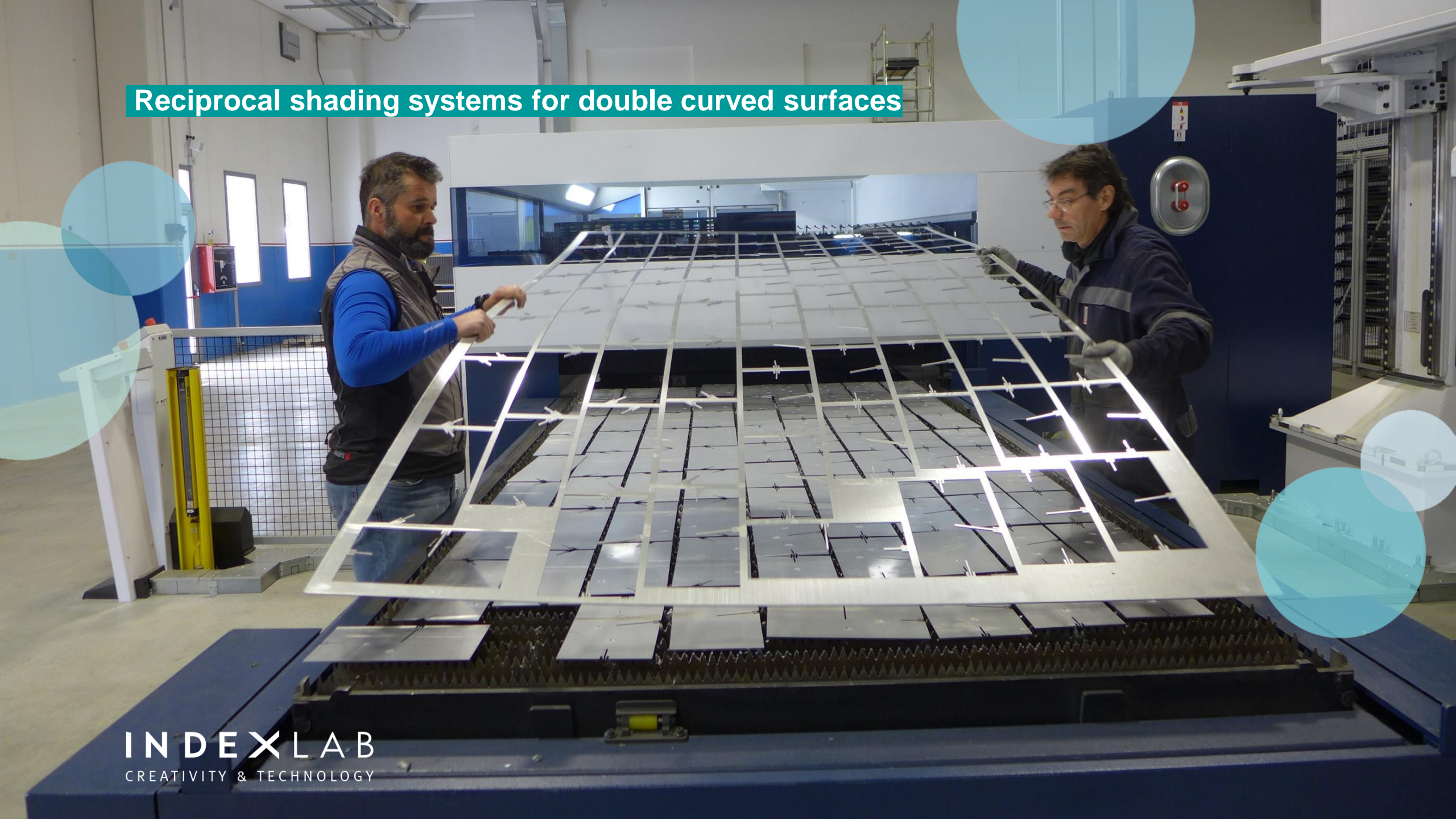
Reciprocal frame optimization systems for spatial structures



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Reciprocal shading systems for double curved surfaces

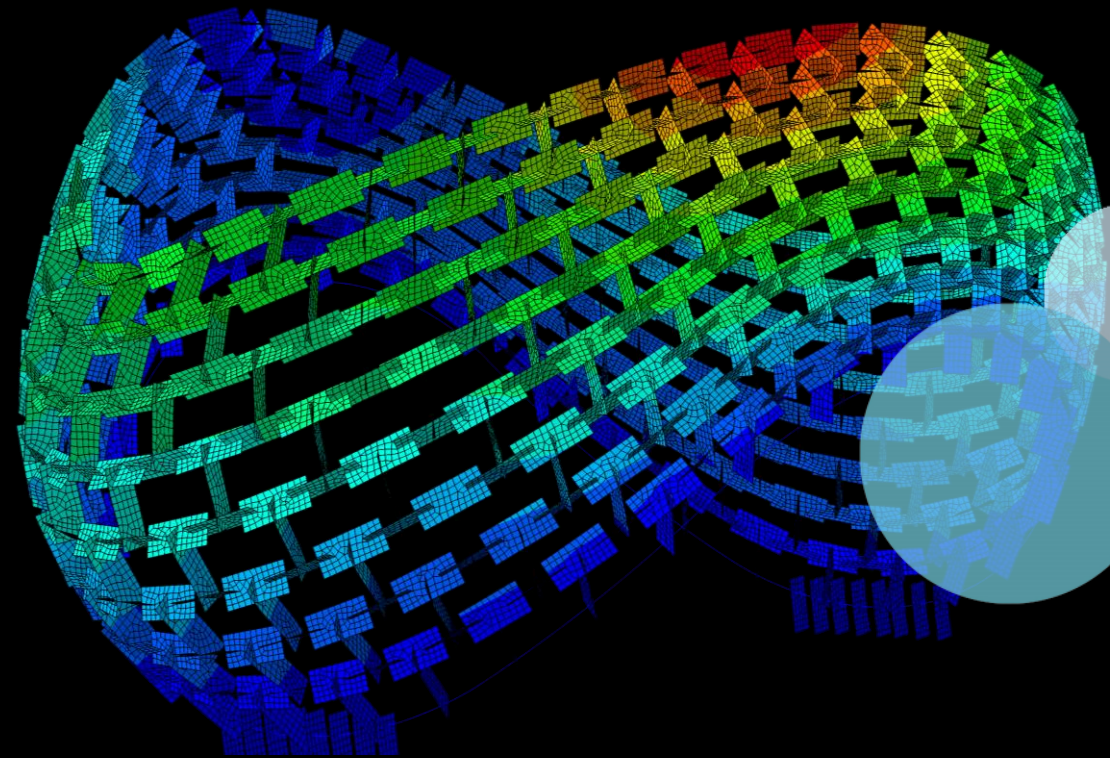


Reciprocal shading systems for double curved surfaces

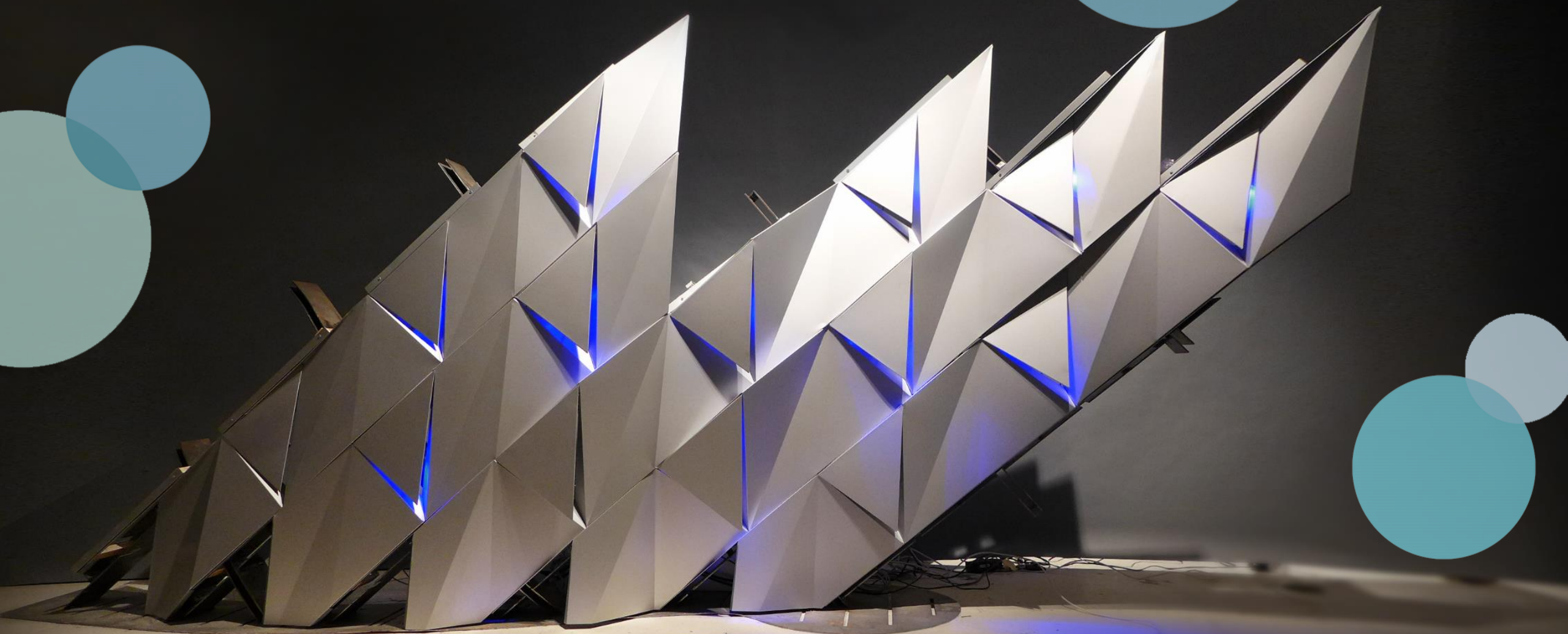
Reciprocal shading systems for double curved surfaces



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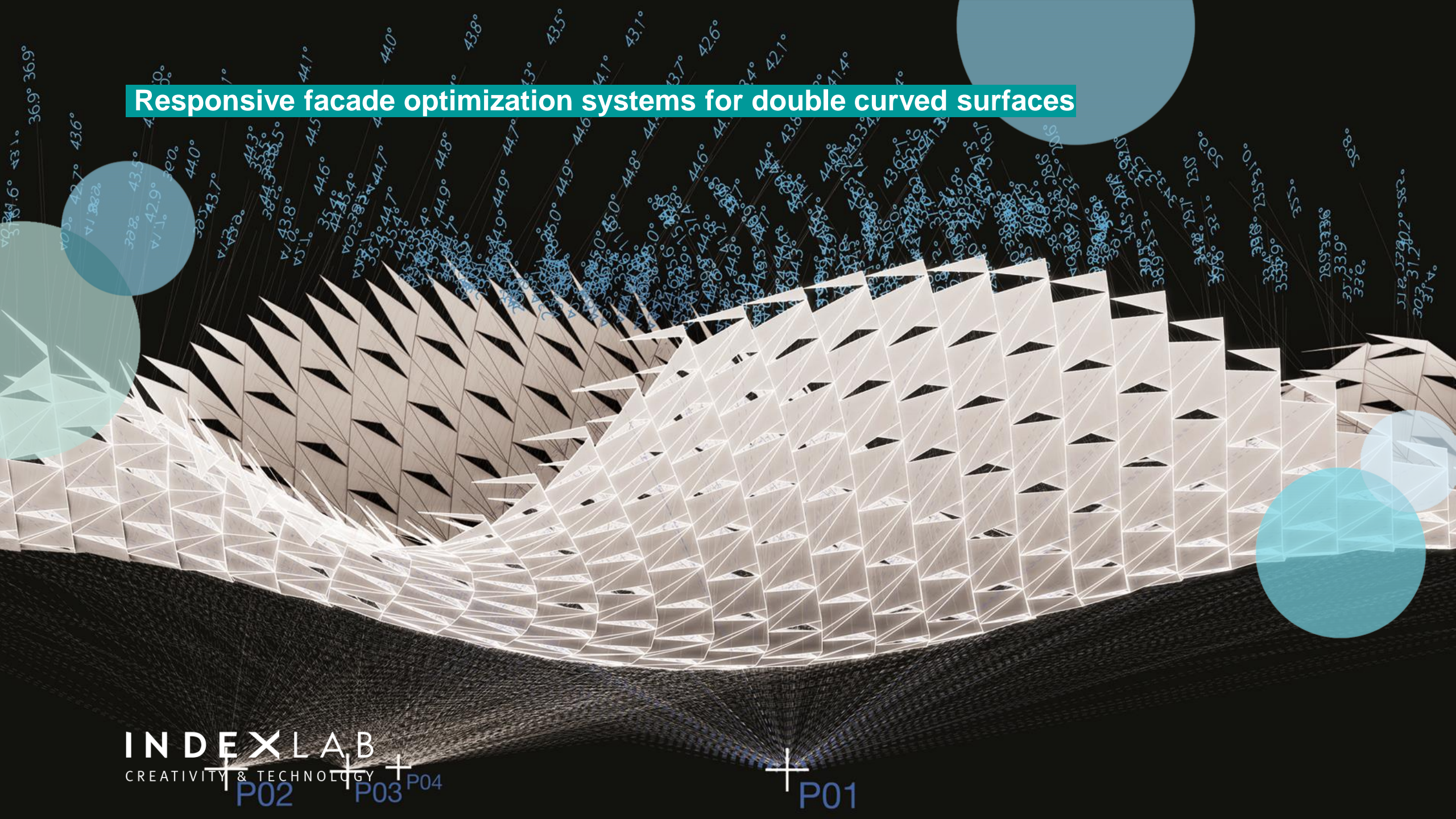
Responsive facade optimization systems for double curved surfaces



Responsive facade optimization systems for double curved surfaces



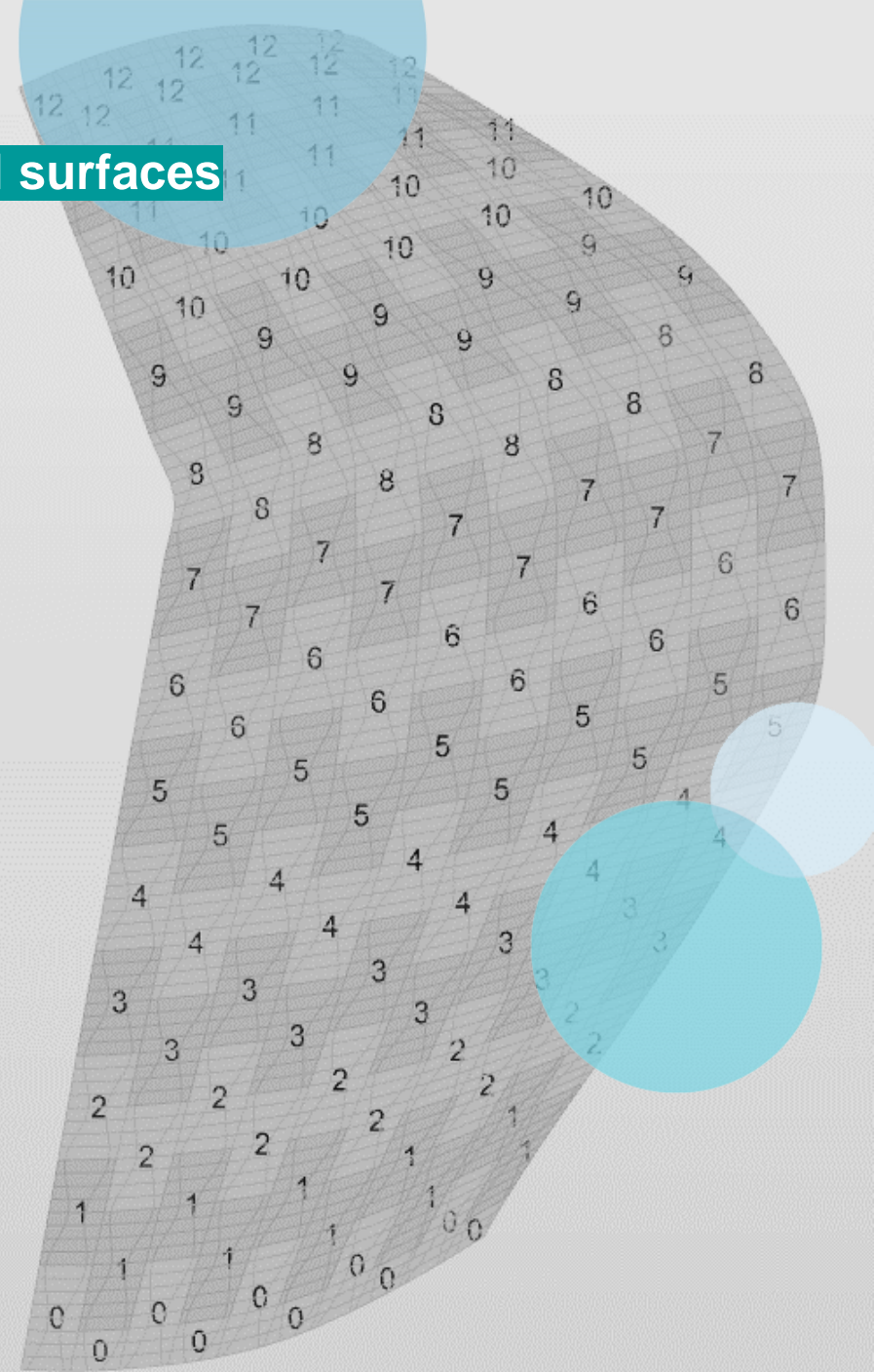
Responsive facade optimization systems for double curved surfaces



Kinetic structure

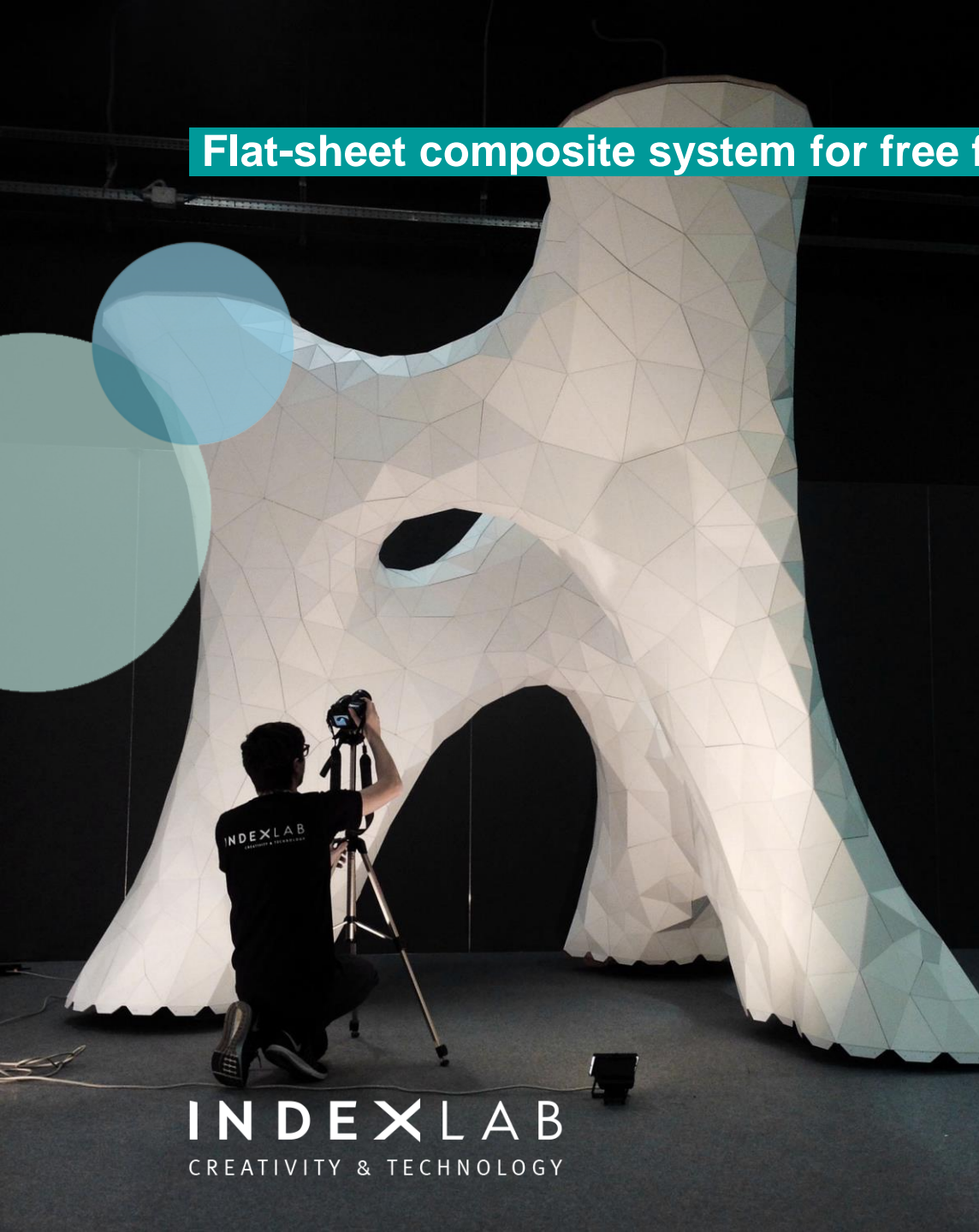
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Responsive facade optimization systems for double curved surfaces



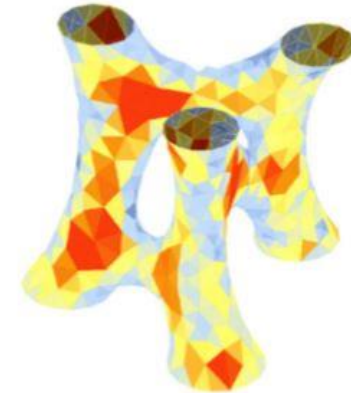
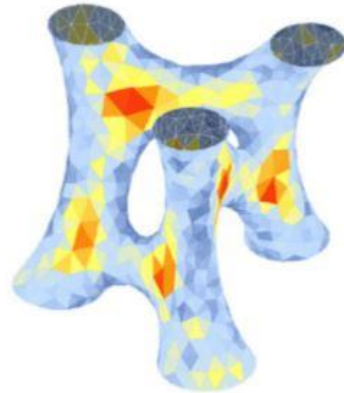
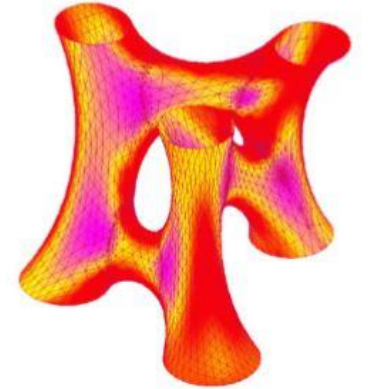
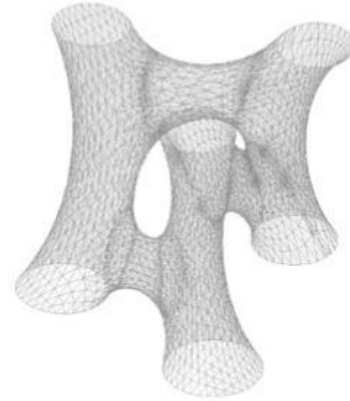
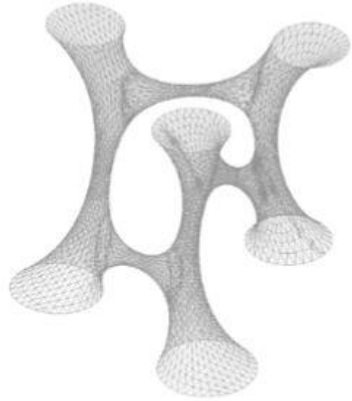
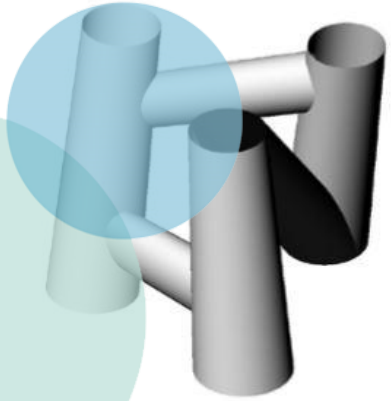
Responsive facade optimization systems for double curved surfaces

Flat-sheet composite system for free form structures and claddings

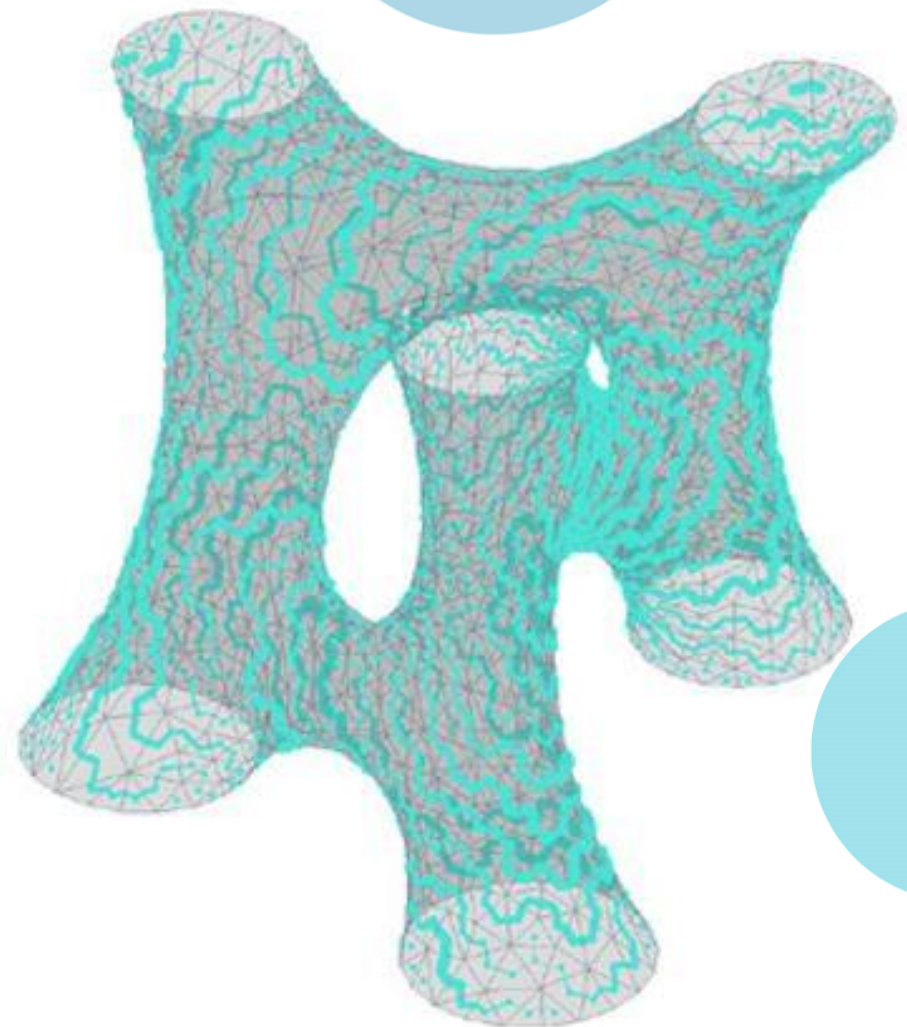


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Flat-sheet composite system for free form structures and claddings




Flat-sheet composite system for free form structures and claddings



Flat-sheet composite system for free form structures and claddings

Origami deployable wood structure

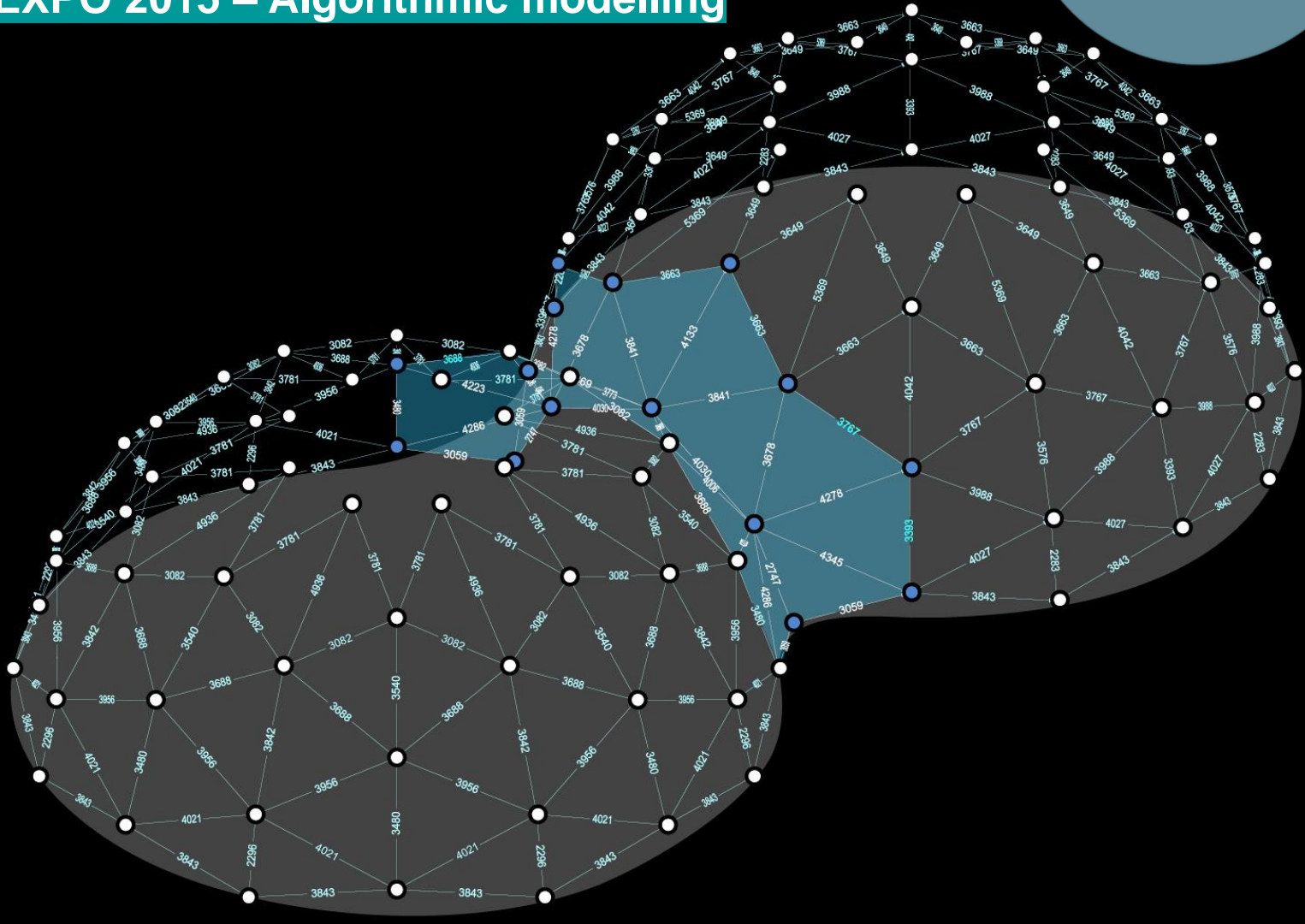
A close-up photograph of a complex, three-dimensional structure made of interlocking wooden blocks. The blocks are arranged in a repeating pattern of light-colored and dark-stained wood, creating a zigzag or chevron-like surface. Each block is perforated with numerous small, circular holes. The structure is set against a light blue background. Several semi-transparent, overlapping circles in shades of blue and teal are positioned around the structure, some containing a pattern of small dots.

Origami deployable wood structure



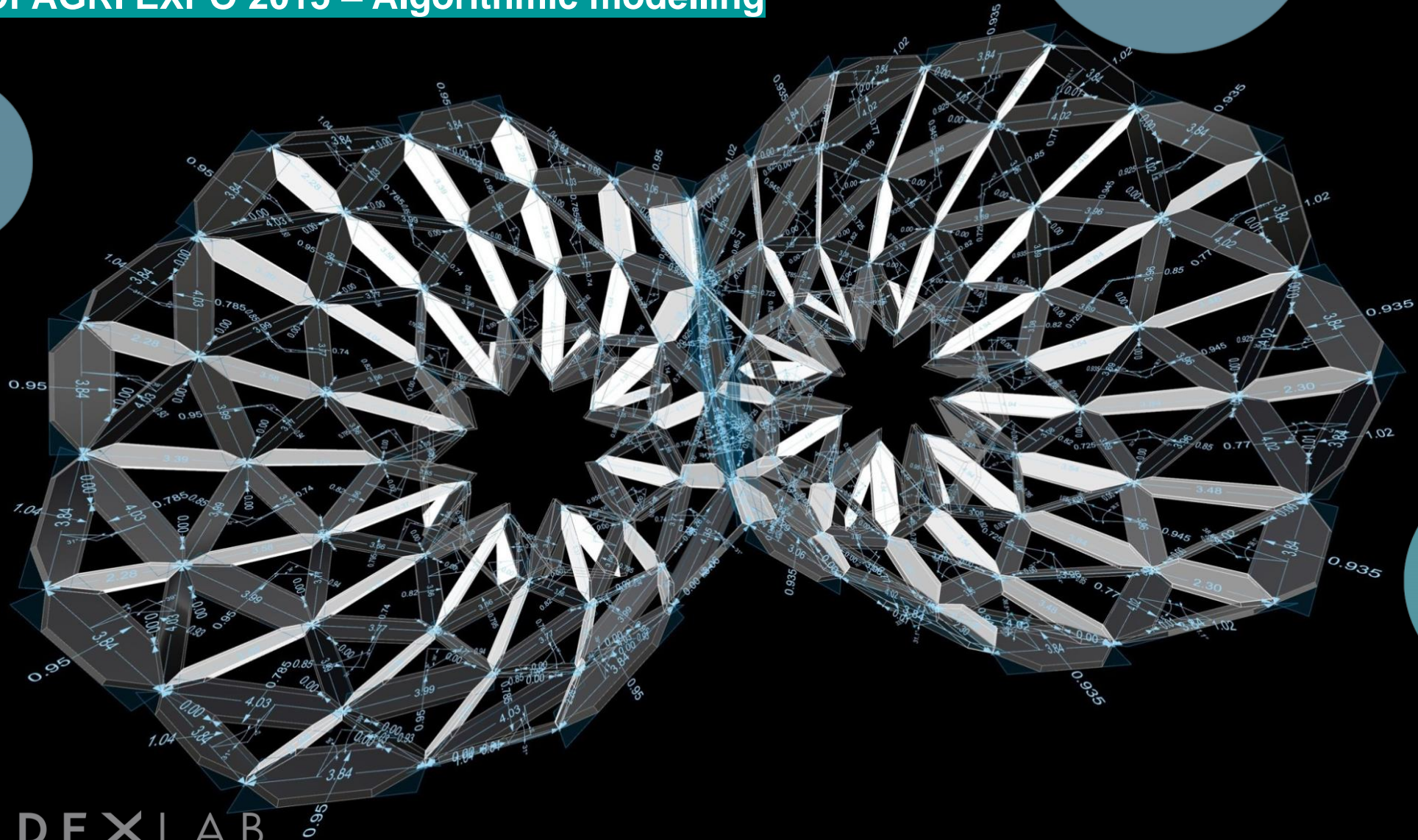
COPAGRI EXPO 2015 – Algorithmic modelling

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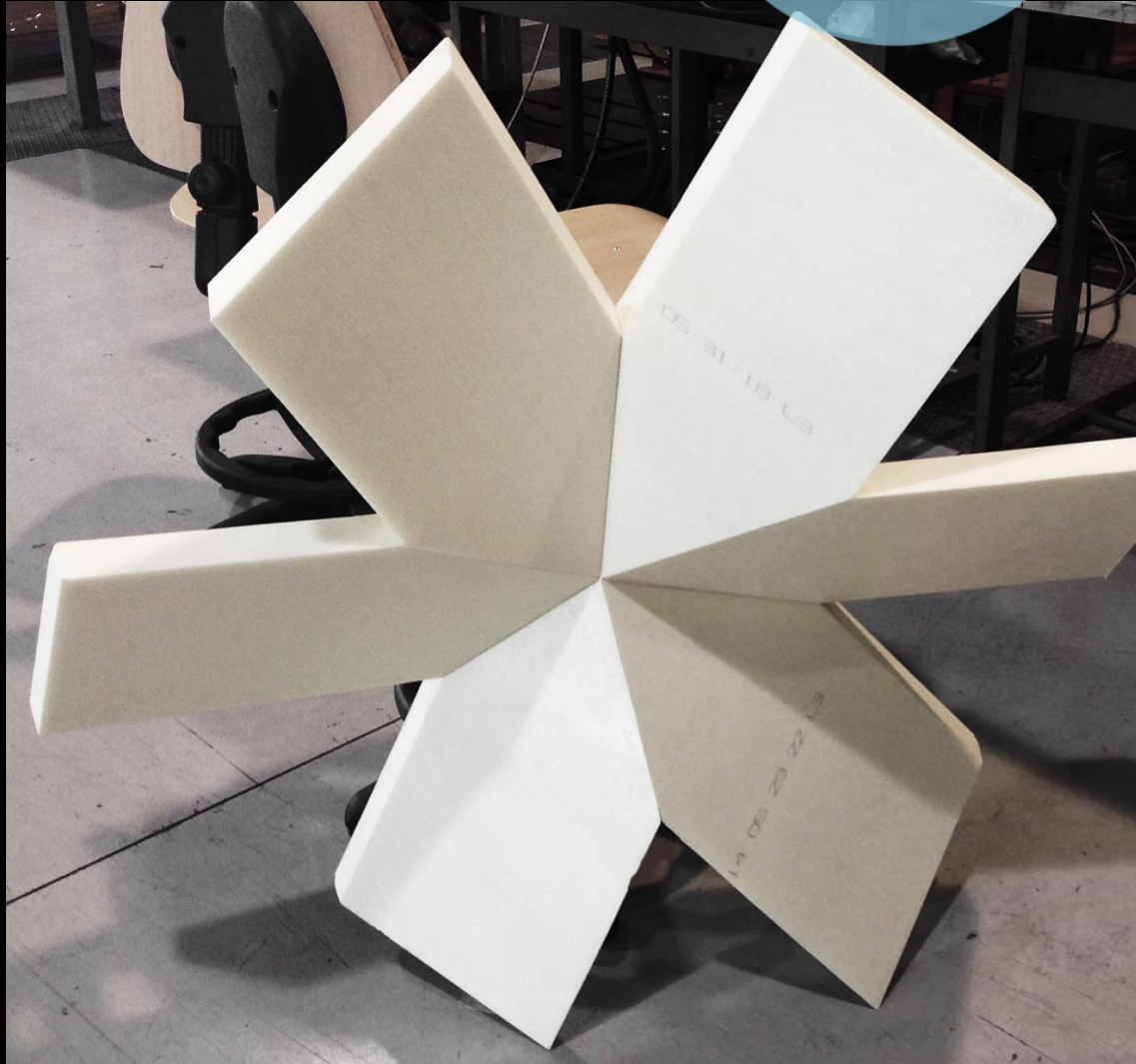
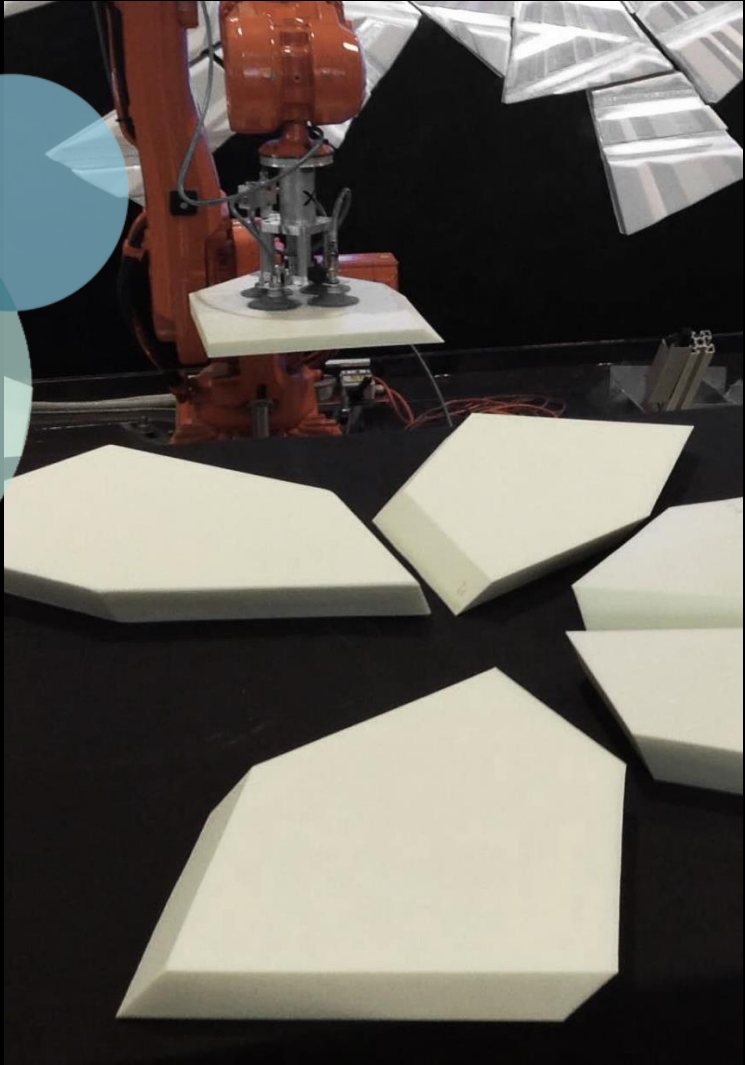


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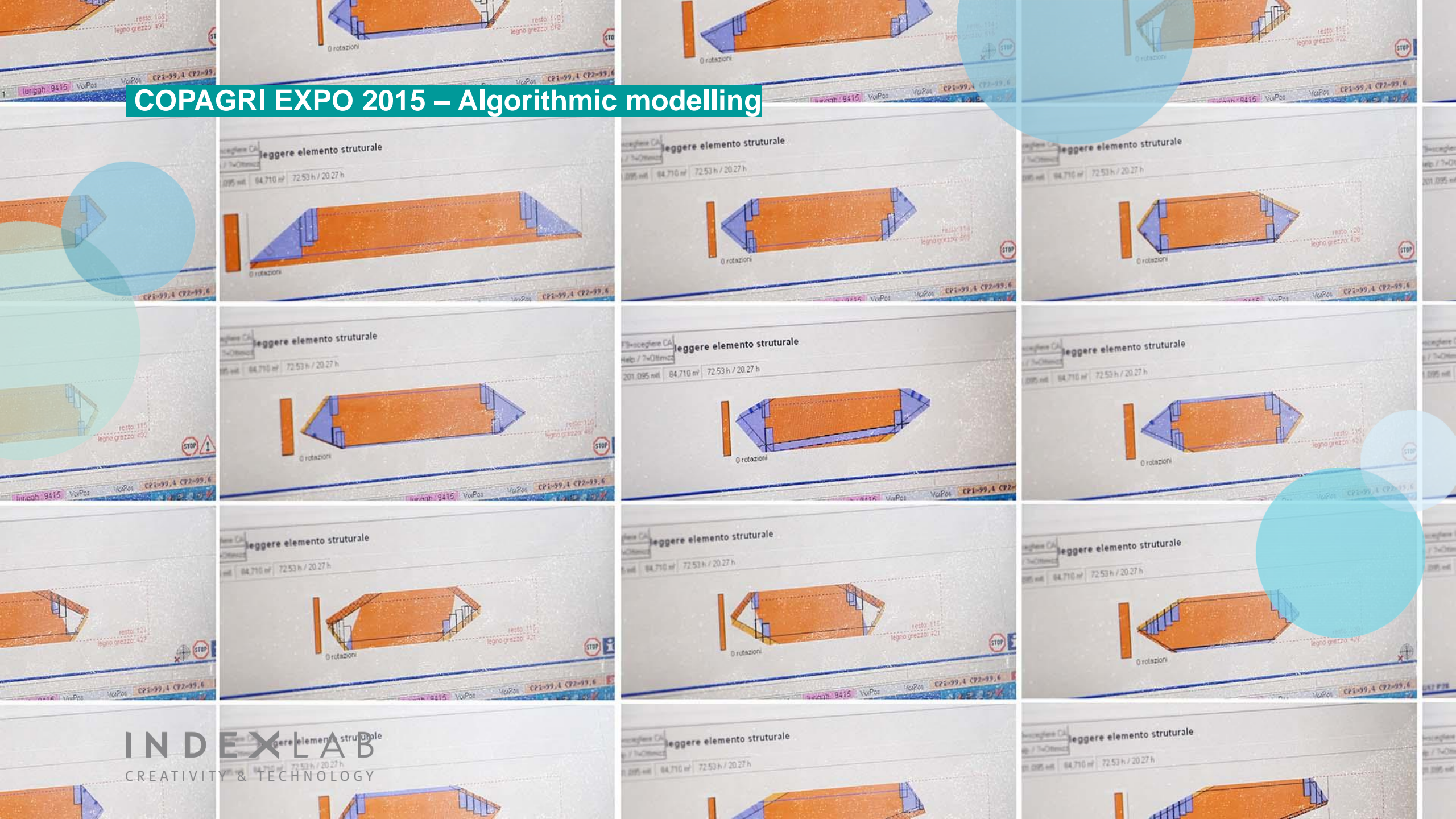


COPAGRI EXPO 2015 – Algorithmic modelling



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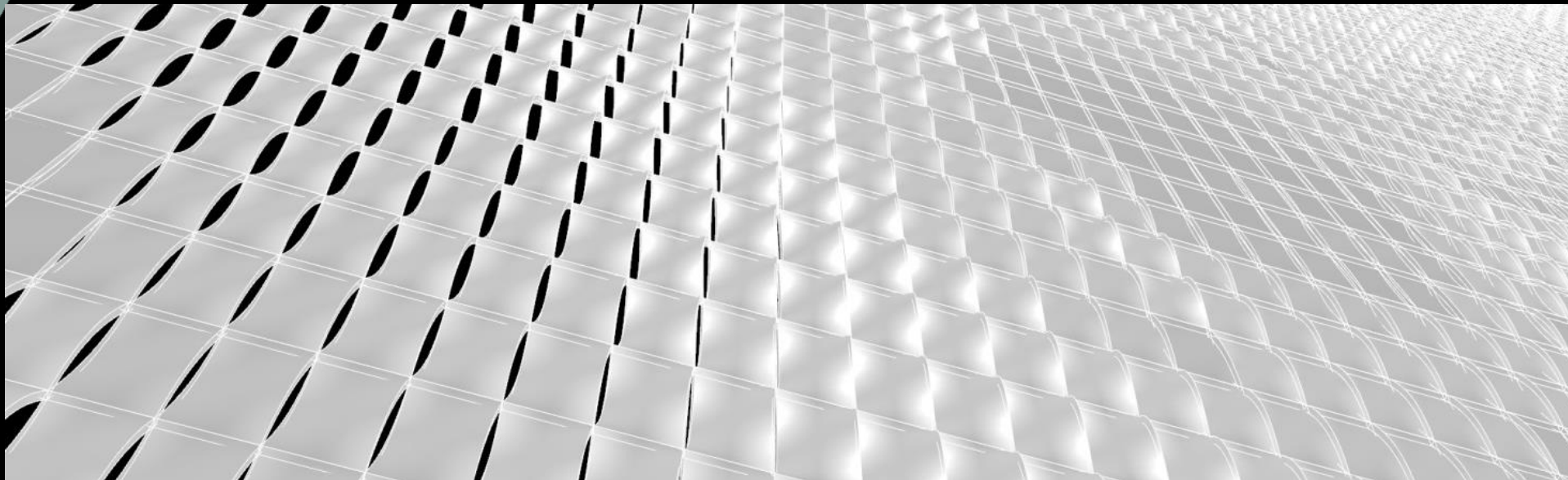
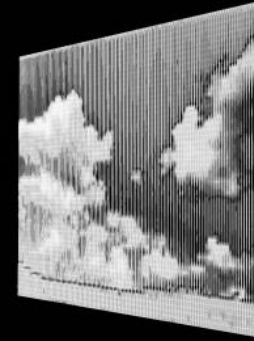
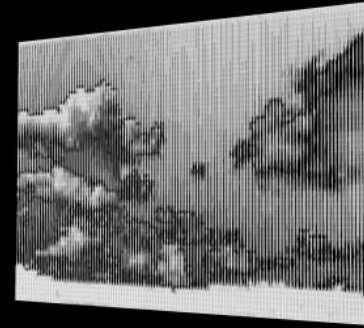
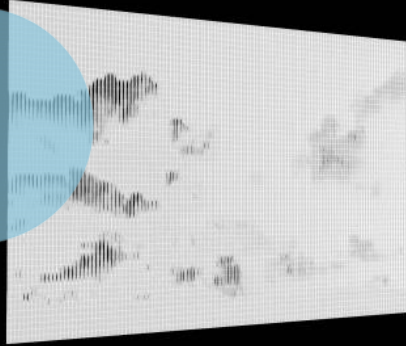
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Robotic manufacturing systems for mass customized insulated wall panels

Robotic manufacturing systems for mass customized insulated wall panels



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Rapid mold manufacturing systems for mass-customized panels

Progettazione algoritmica
e fabbricazione robotica

Computazione e materiali
architettura

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Rapid mold manufacturing systems for mass-customized panels

Rapid mold manufacturing systems for mass-customized panels





Rapid mold manufacturing systems for mass-customized panels

Rapid mold manufacturing systems for mass-customized panels

Automated fiber placement systems for composite structures and building components



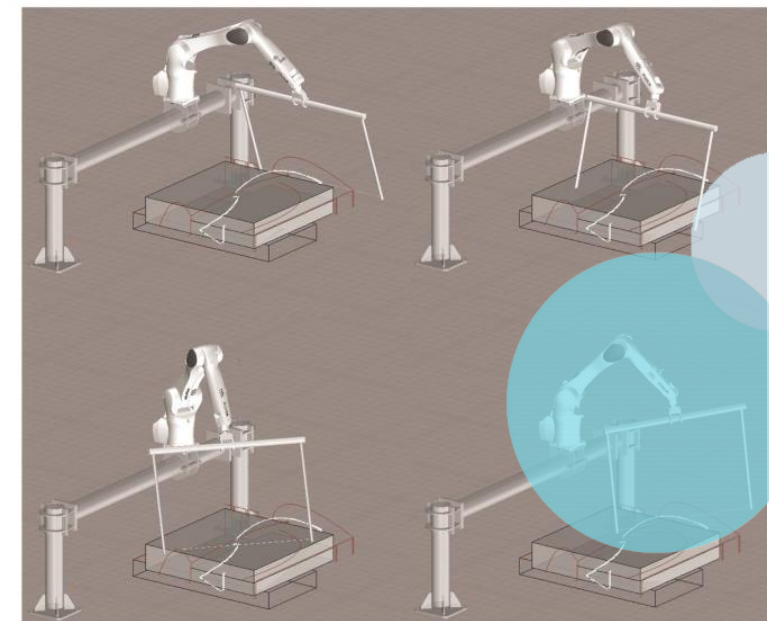
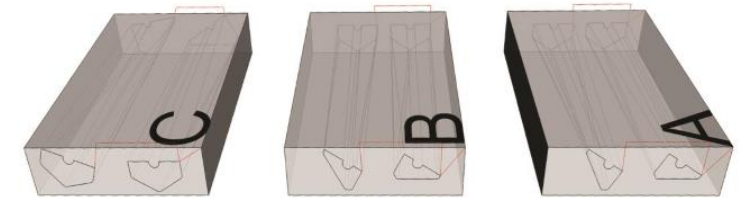
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MIT CARBON
WITH CARBON
97 ton

BETON NUR
CONCRETE

Automated fiber placement systems for composite structures and building components





Rapid mold manufacturing systems for mass-customized panels

Rapid mold manufacturing systems for mass-customized panels



Rapid mold manufacturing systems for mass-customized panels

