THE UNIVERSITY OF
MELBOURNE

MELBOURNE SCHOOL OF DESIGN

FACULTY OF ARCHITECTURE, BUILDING AND PLANNING

Digital **D**esign **A**pplication

CRIDA: Critical Research in Digital Architecture.

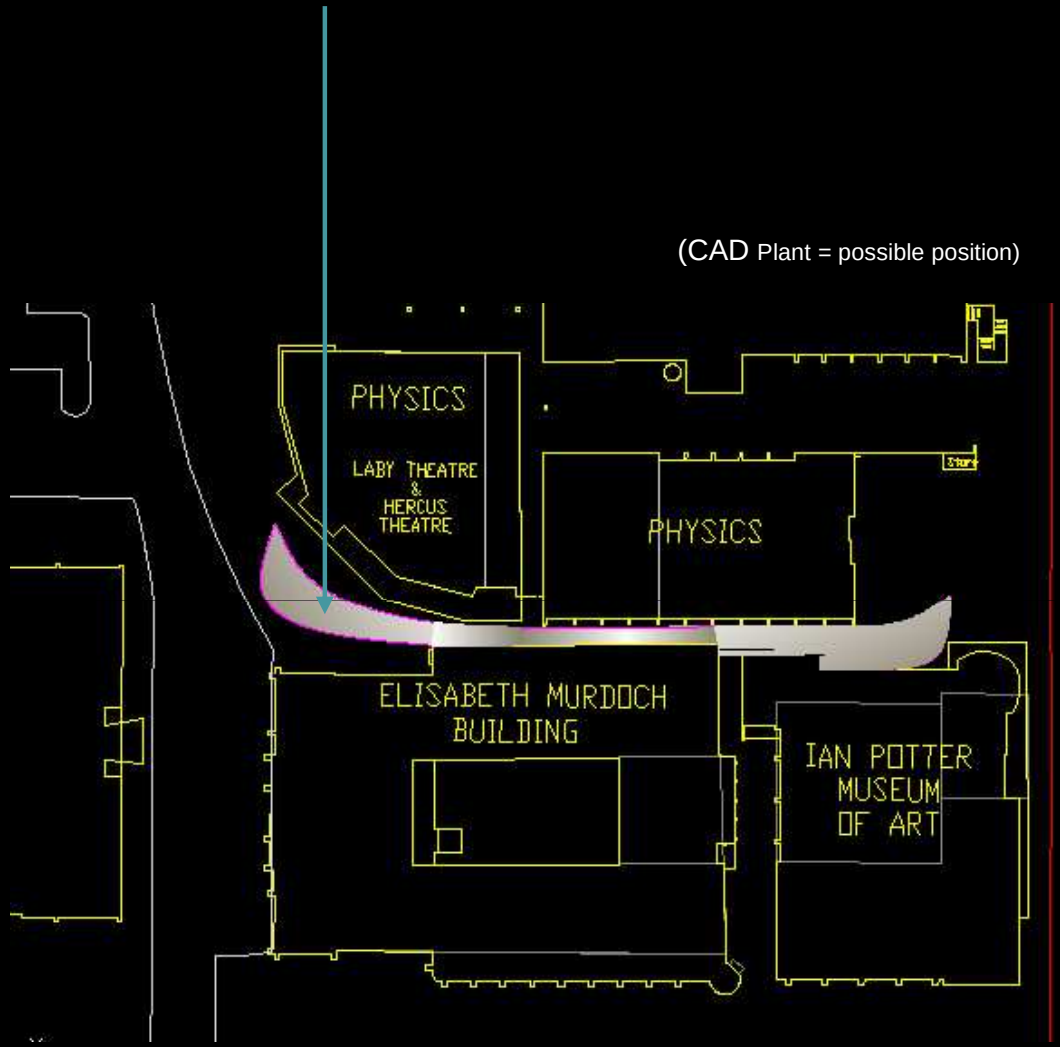
Fabrication proposal:

ENVELOPE FOR A SPATIAL CORRIDOR
Castro’s Café to Brunetti’s _UNIMELB

project

Creating a structure for the “Spatial Corridor” able to control the solar light and the wind and to provide the support for artificial light at night.

(CAD Plant = possible position)

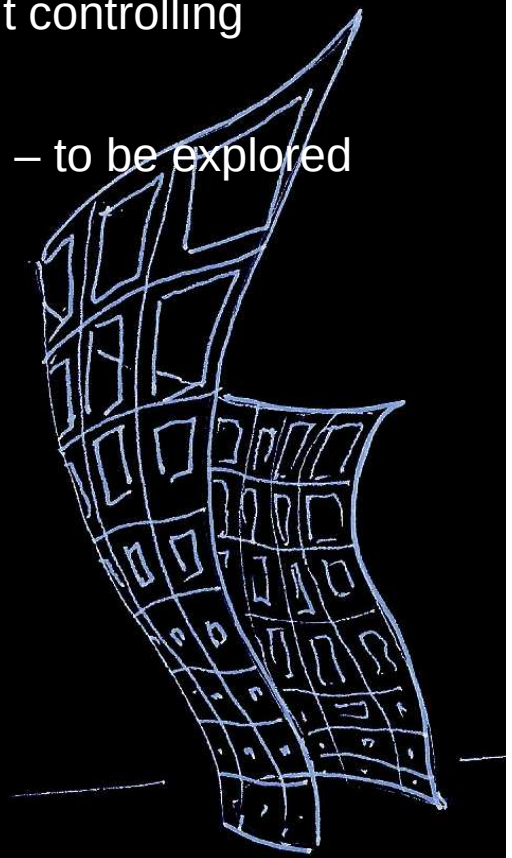


concept

Using a tessellation to create a continue double curve _ Controlling the variations
Fabricating an efficient system _ Creating an unique element _ testing by making

design aspects

- the main component & its variations
  - · Different opened space on each component – light controlling
  - · Variation in size – to be explored
- the joint
  - · Variable – to be explored
  - · Static Vs Dynamic
- the final form of the components group to be placed around the corridor.



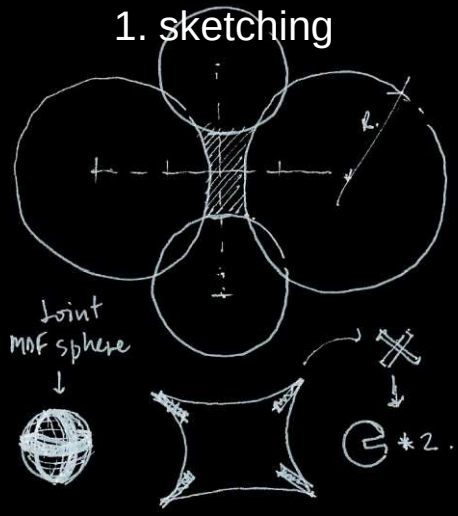
testing by making _ critical approach

m_01

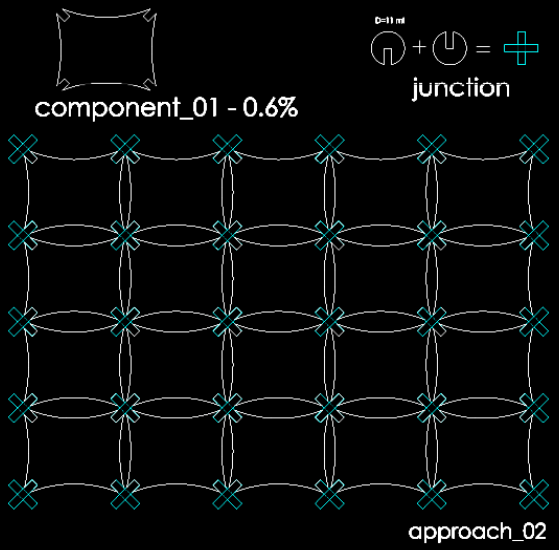
Model_01

design approach

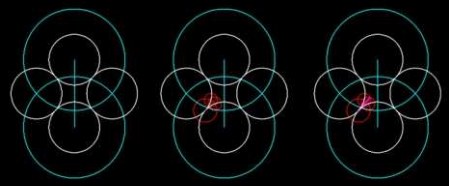
1. sketching



2. CAD representation

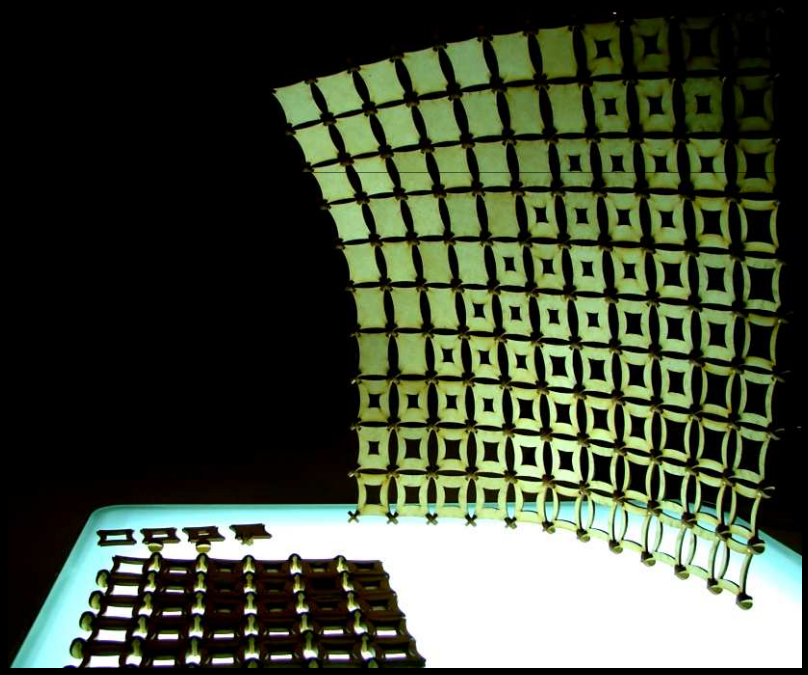


creating the component



component variations

3. Laser cutter & Fabrication



testing by making _ critical approach

m_01

Model_01 → Conventional exploration process

+ aspects

- same size of the component = low cost – easy fabrication
- same type of joint = low cost – easy fabrication
- no extra materials (glue) = low cost – easy fabrication
- 4 different components = tessellation – variable shadow
- no extra time on digital design

– aspects

- static result = no easy exploring variations
- using material tolerance = depending on the material
- base on a small number of components = inefficient to export to a large model
- decrease the possibilities of documentation = no digital 3D
- based on forcing the material = risky real application

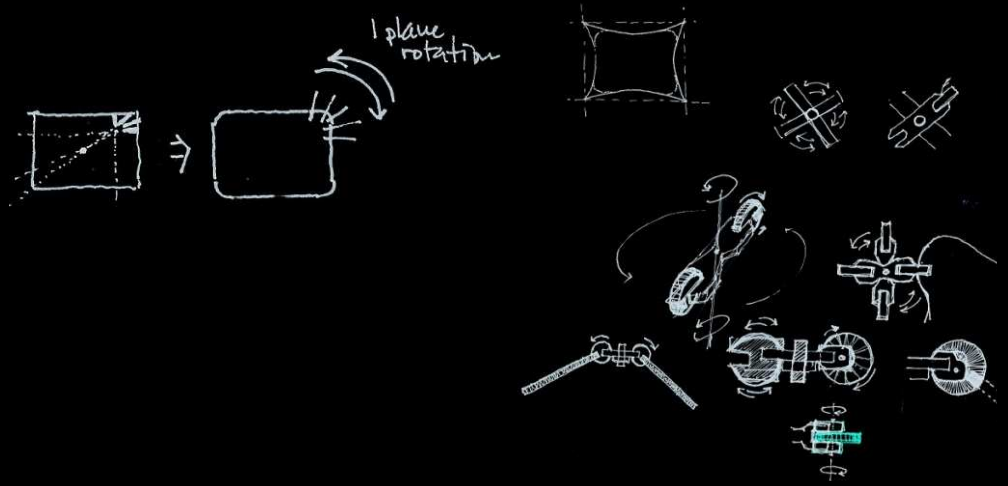
testing by making _ critical approach

m_02

Model_02

design approach

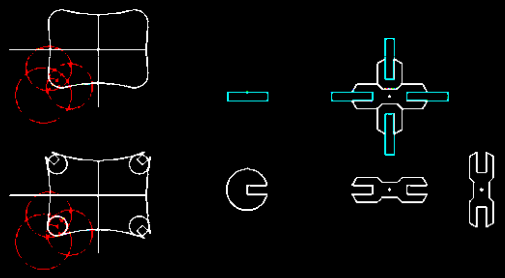
1. sketching



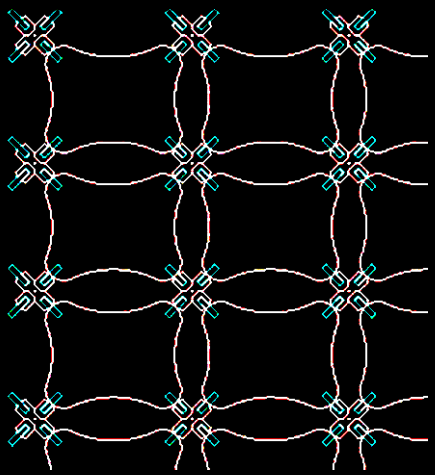
2. CAD representation

creating the component

joint

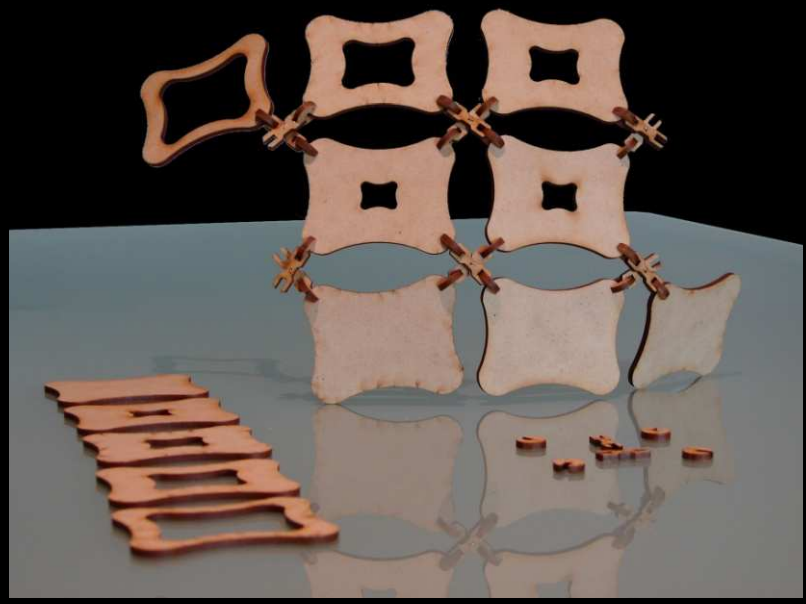


group of components



component variations

3. Laser cutter & Fabrication



testing by making _ critical approach

Model_02 → Conventional exploration process : imitating a computer

+ aspects

- rotating joint = to explore multiple shapes and variations
- customize joint = each joint will be different
- same size of the component = low cost – easy fabrication
- same components of the joint = repetitive mech. system
- no extra materials (glue) = low cost – easy fabrication
- 4 different components = tessellation – variable shadow
- no extra time on digital design

- aspects

- dynamic model = no real applications_ static Architecture
- customization process = inefficient to be studied for each joint separately.
- too complicated system = mechanical approach
- using material tolerance = depending on the material
- base on a small number of components = inefficient
- decrease the possibilities of documentation = no digital 3D

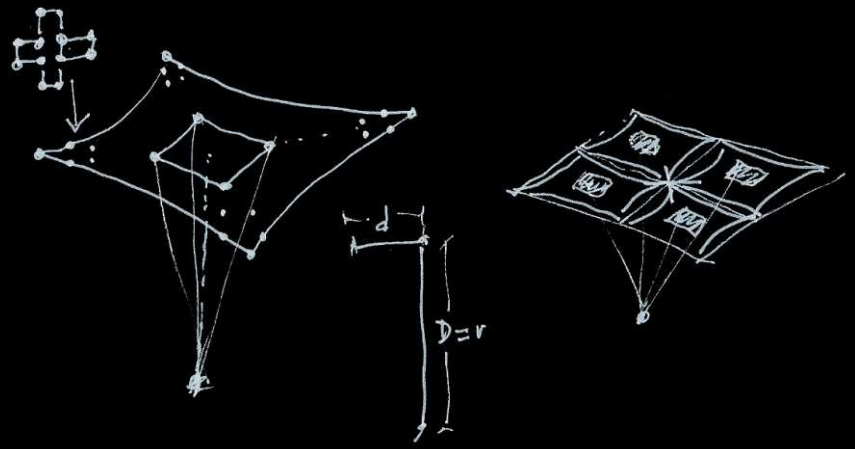
testing by making _ critical approach

m_03

Model_03

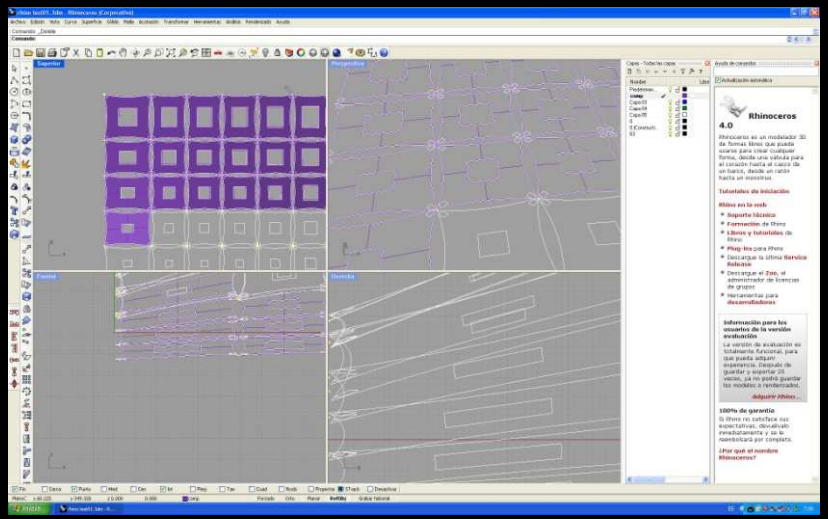
design approach

1. Sketching to make efficient the previous design



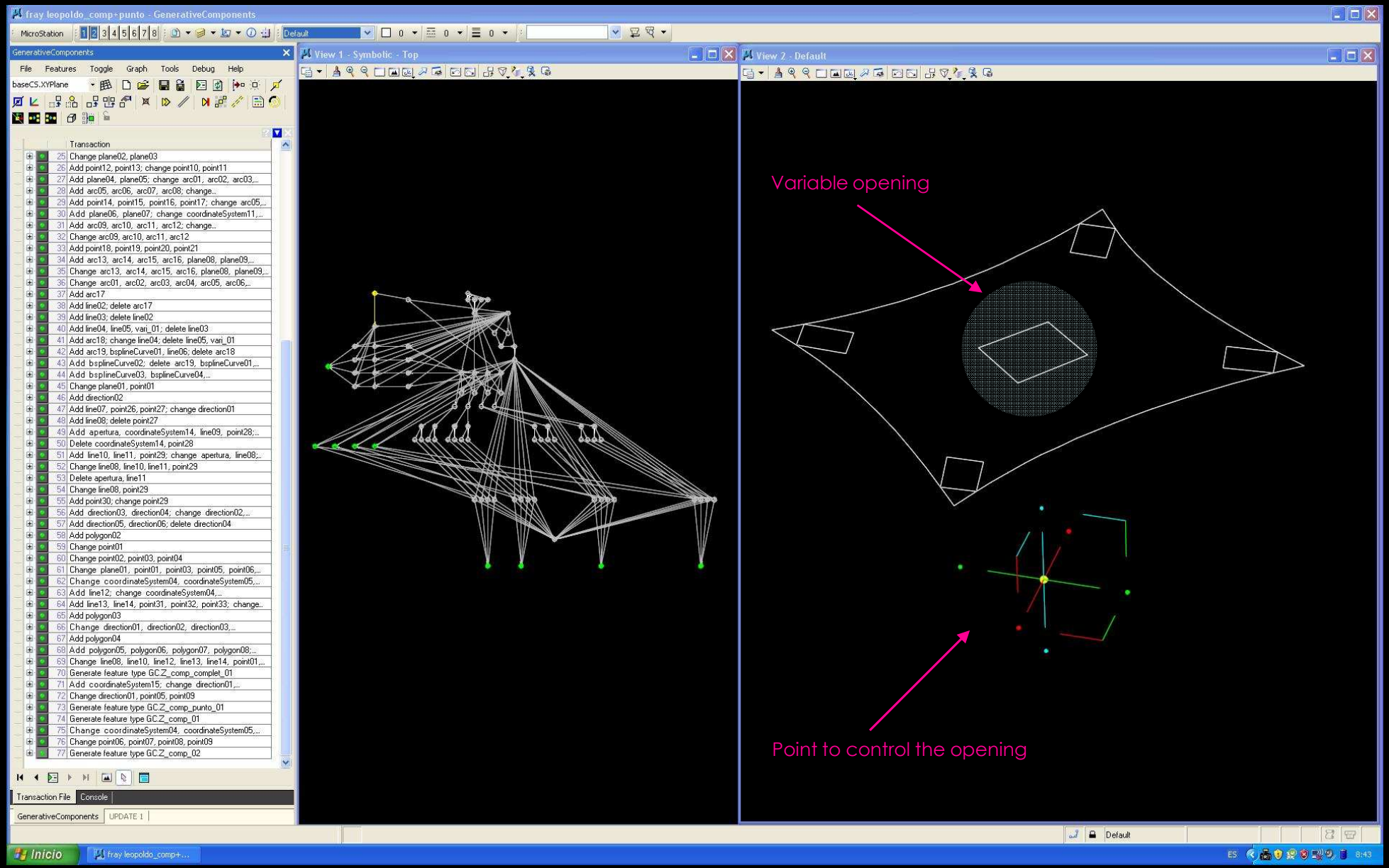
2. Modeling by using Generative Component

3. Exporting to rhino to unfolding

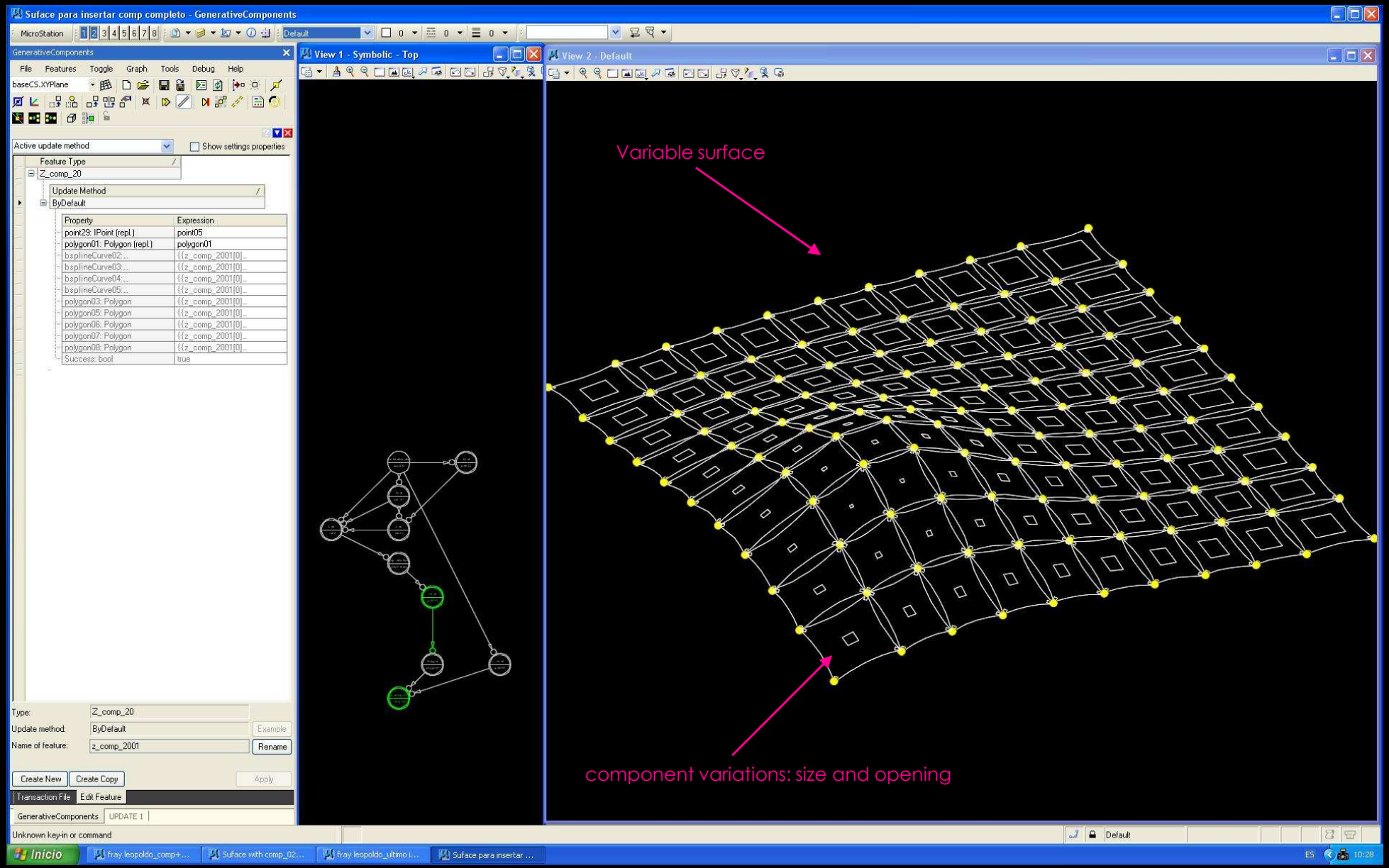


4. Laser cutter & Fabrication _ next stage to be completed

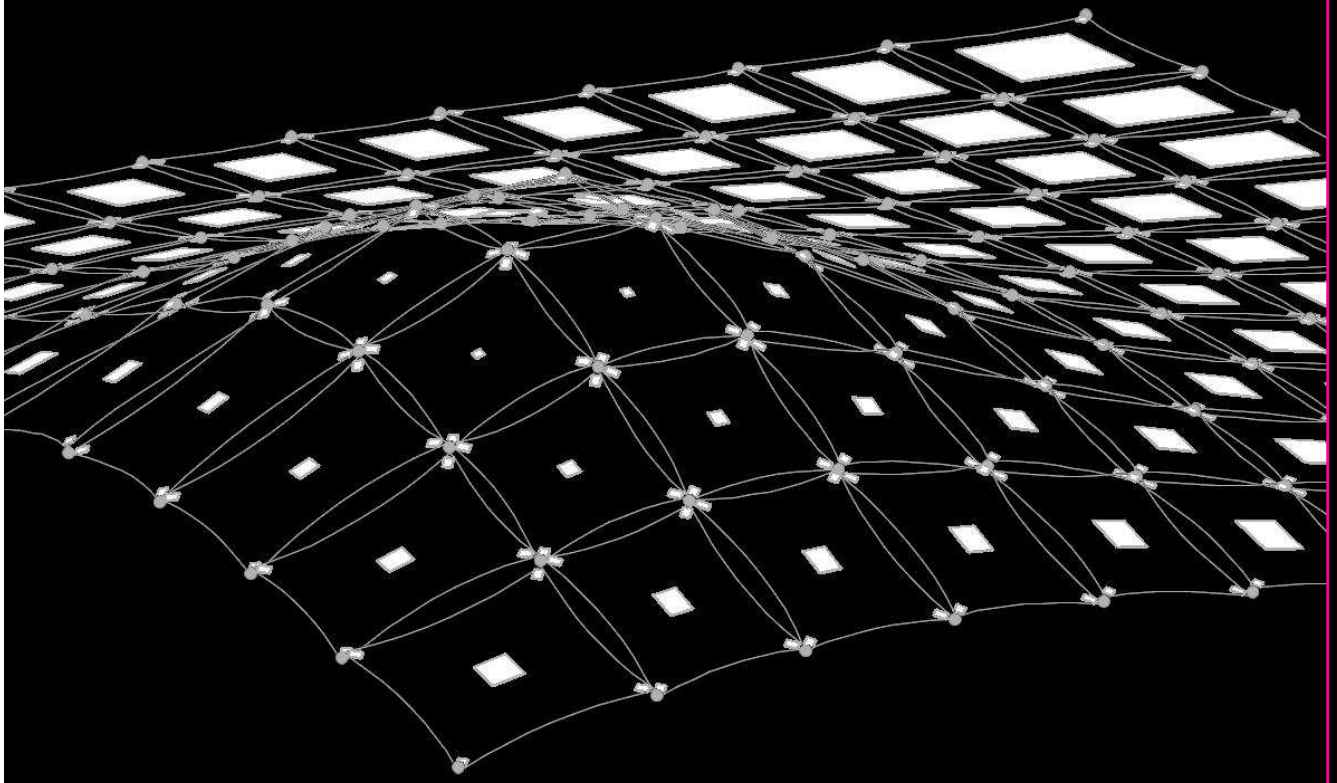
Model_03 ⟶ GC model_ process: 1. CREATING A REACTIVE COMPONENT

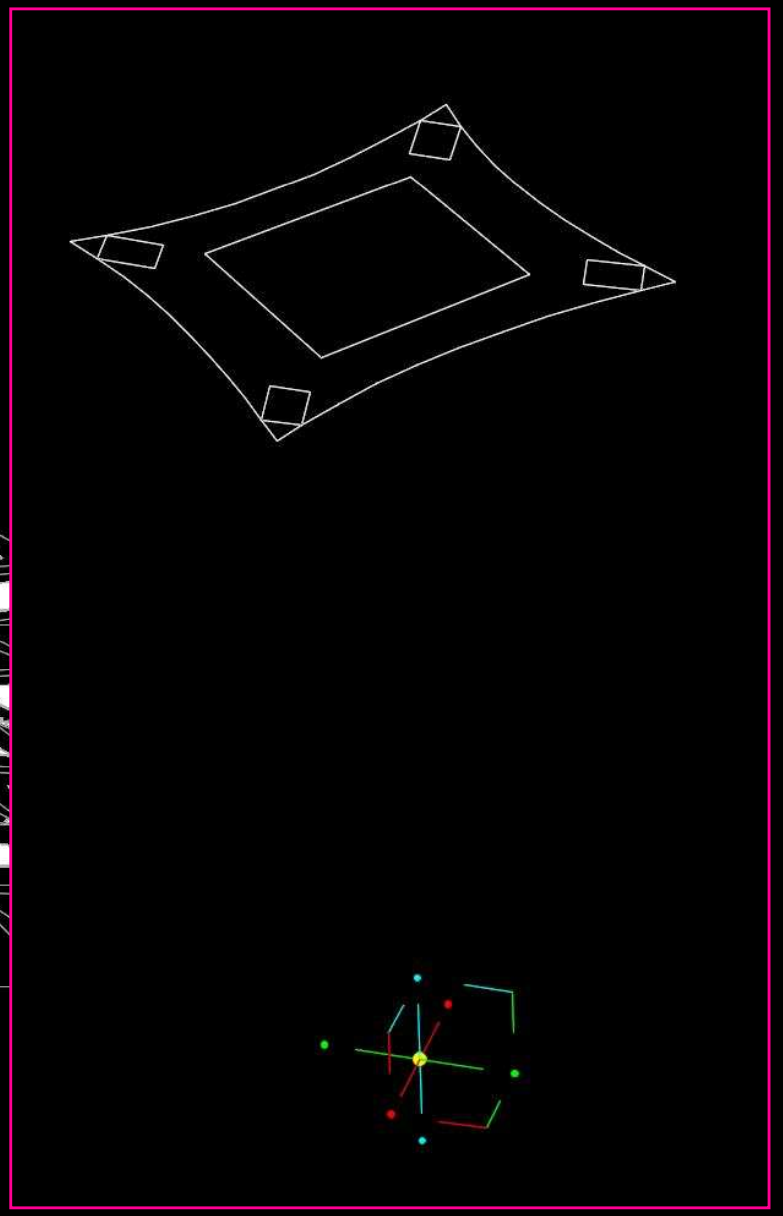


Model_03 ⟶ GC model_ process: 2. APPLICATION ON A VARIABLE SURFACE



Model_03 → GC model_ process: 3. EXPLORING THE RESULT





testing by making _ critical approach

m_03

Model_03 → Digital exploration process : working efficiently

+ aspects

- variable component = to explore efficiently multiple shapes
- customize joint = each joint will be different
- the material is not forced = real application
- reduced complexity of the system
- customize openings of component = efficient tessellation
- no extra time on variations = easy exploring with GC model
- increase possibilities of documentation = digital 3D

- aspects

- necessity of CNC for each component and joint
- extra time on GC digital design
- require the understanding of the software
- possibility of unreal results in terms of fabrication

testing by making _ critical approach

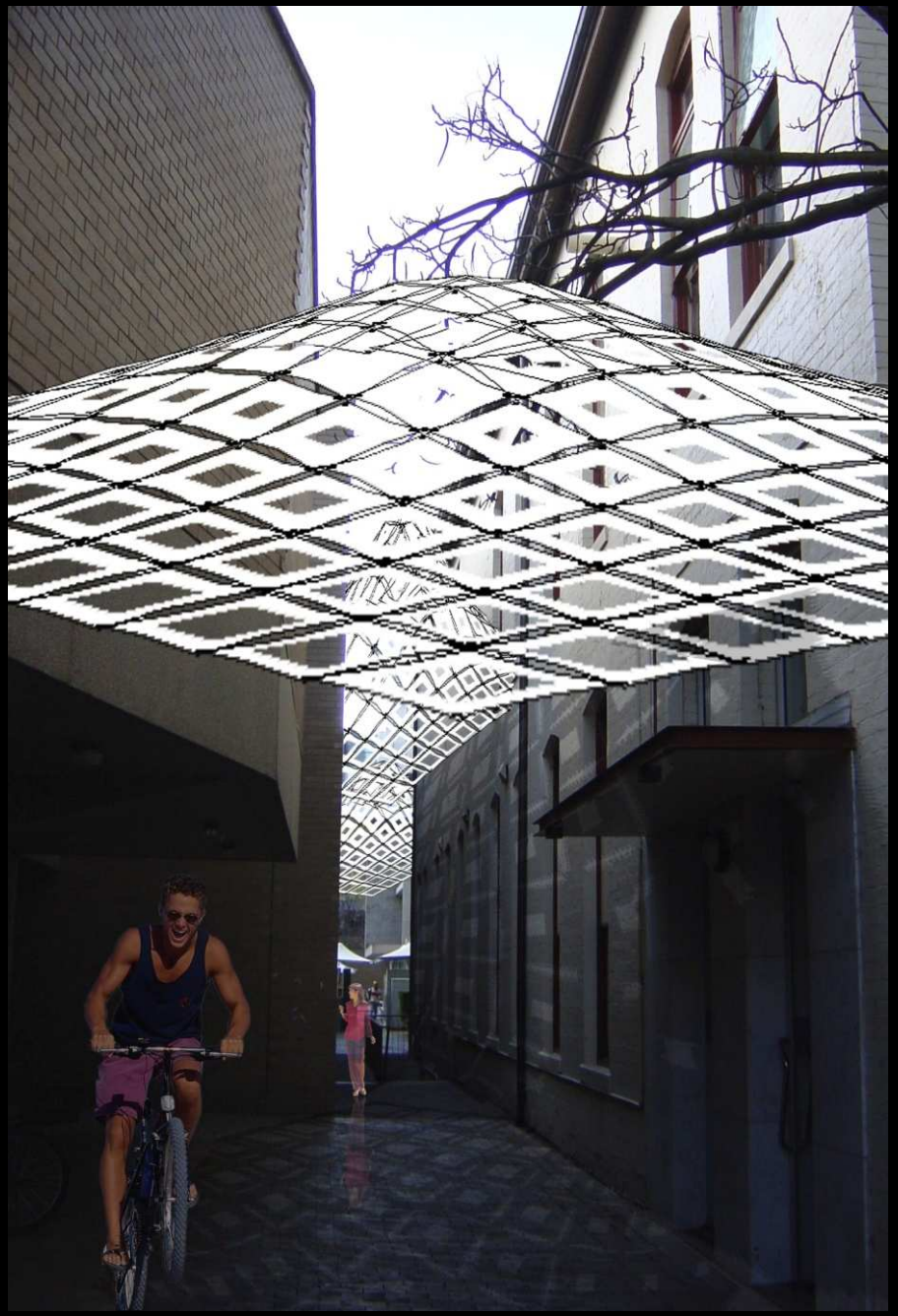
m_03

Model_03 ⟶ Digital Design Application

· the continuous surface changes from vertical to horizontal position.

· vertical pos. wind & privacy control

· horizontal pos. rain & light control



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m_03

Model_03 ⟶ Digital Design Application

· the continuous surface has the possibility of providing artificial light at night time.

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conclusions

Digitally driven design processes can produce unique objects based on an efficient system of creation, fabrication, documentation and testing of variations.

Digital design should: be guided by fabrication logic,
consider the properties of materials and
face the real approach of the whole project.

Digital design has unlimited possibilities in terms of project scale. The number of components become unlimited providing the tools to control them.

The probability of fabrication mistakes increases because customized components are included. Consequently CNC process and excellent documentation are necessary to avoid inefficiency.

Artist's logic cannot be substituted by a computer program.

Digital design is a new tool used nowadays to create and explore the design, far beyond the representation purposes of the past.

Therefore, nowdays Computers become extensions of our brain, and not only of our hands.

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