OSAMA HASHEM

ARCHITECTURE PORTFOLIO

Shenzhen Opera House

Professional project
Status: Competition
Year: 2019
Role: Design partner

Contribute:
-Early concept stage
-Facade patterns design
-Roof design and opening system

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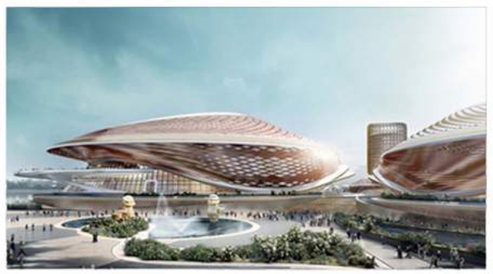
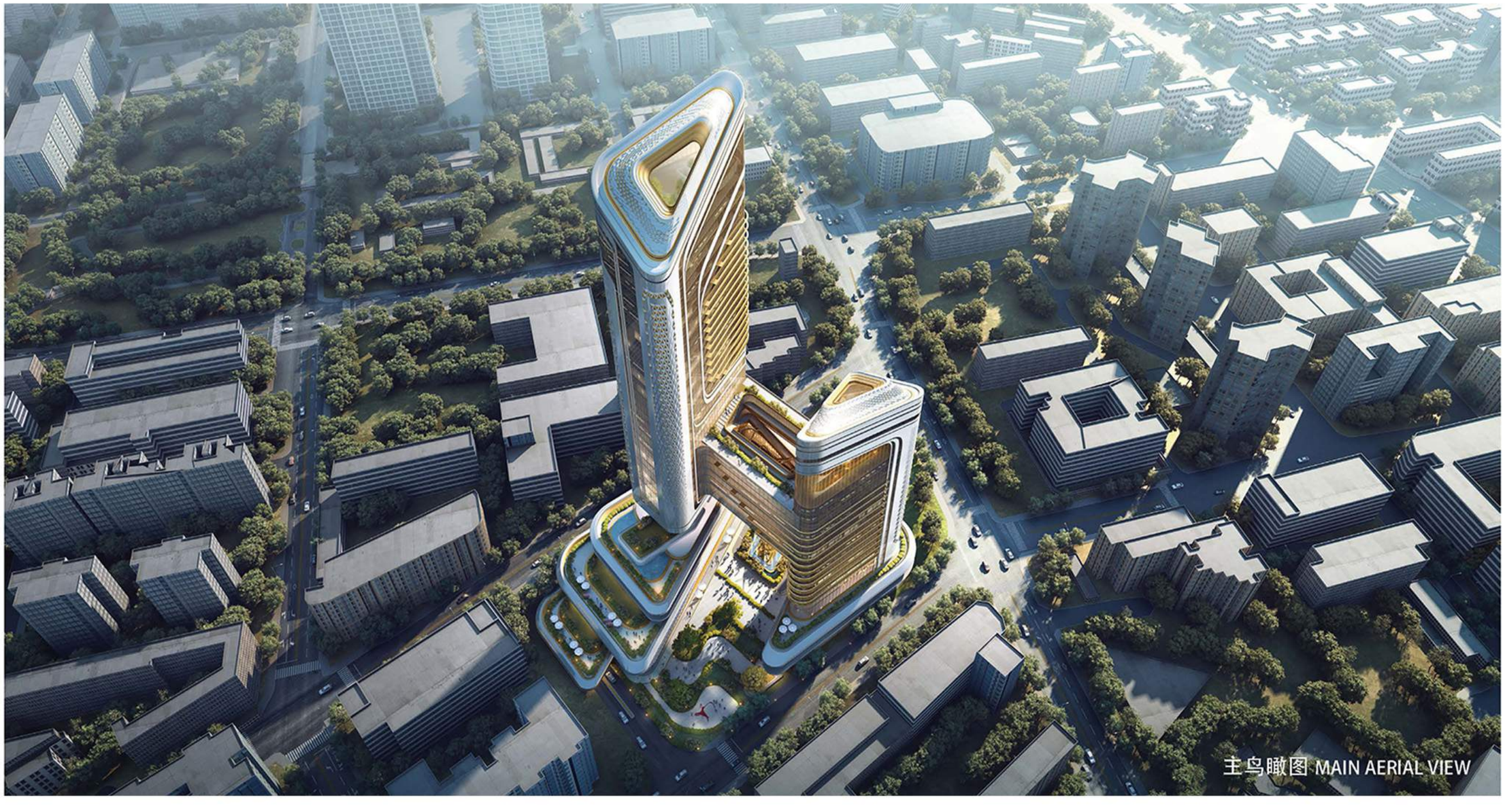


Vanek Intelligent Manufacturing Tower

Professional project
Status: Competition
Year: 2020
Role: Design partner

Contribute:
-Facade design
-Design detailing and panelization
-Environmental Analysis

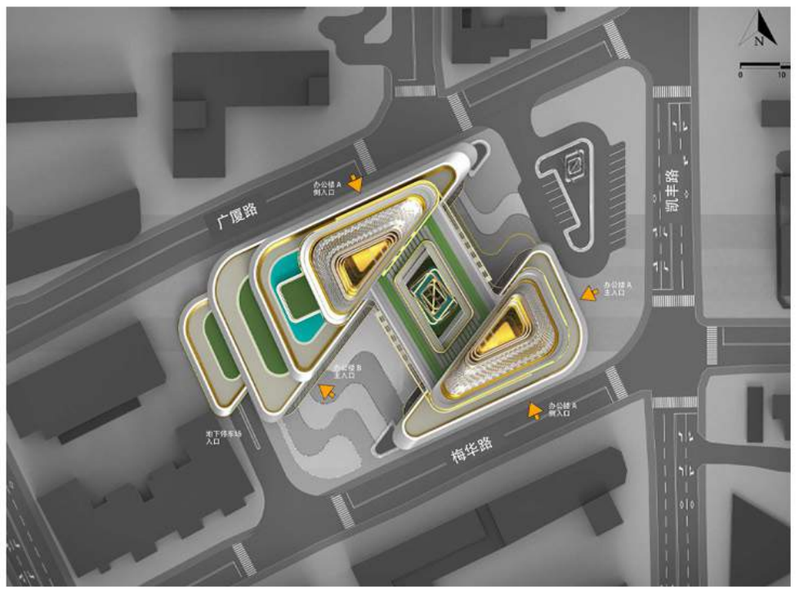


主鸟瞰图 MAIN AERIAL VIEW

Vanek Intelligent Manufacturing Tower

Professional project
Status: Competition
Year: 2020
Role: Design partner

Contribute:
-Facade design
-Design detailing and panelization
-Environmental Analysis



Guoshen Museum

Professional project
Status: Competition
Year: 2020
Role: Design partner

Contribute:
-Assistant designer
-Facade design & panelization
-Sun analysis and study diagrams

视图

Guoshen Museum

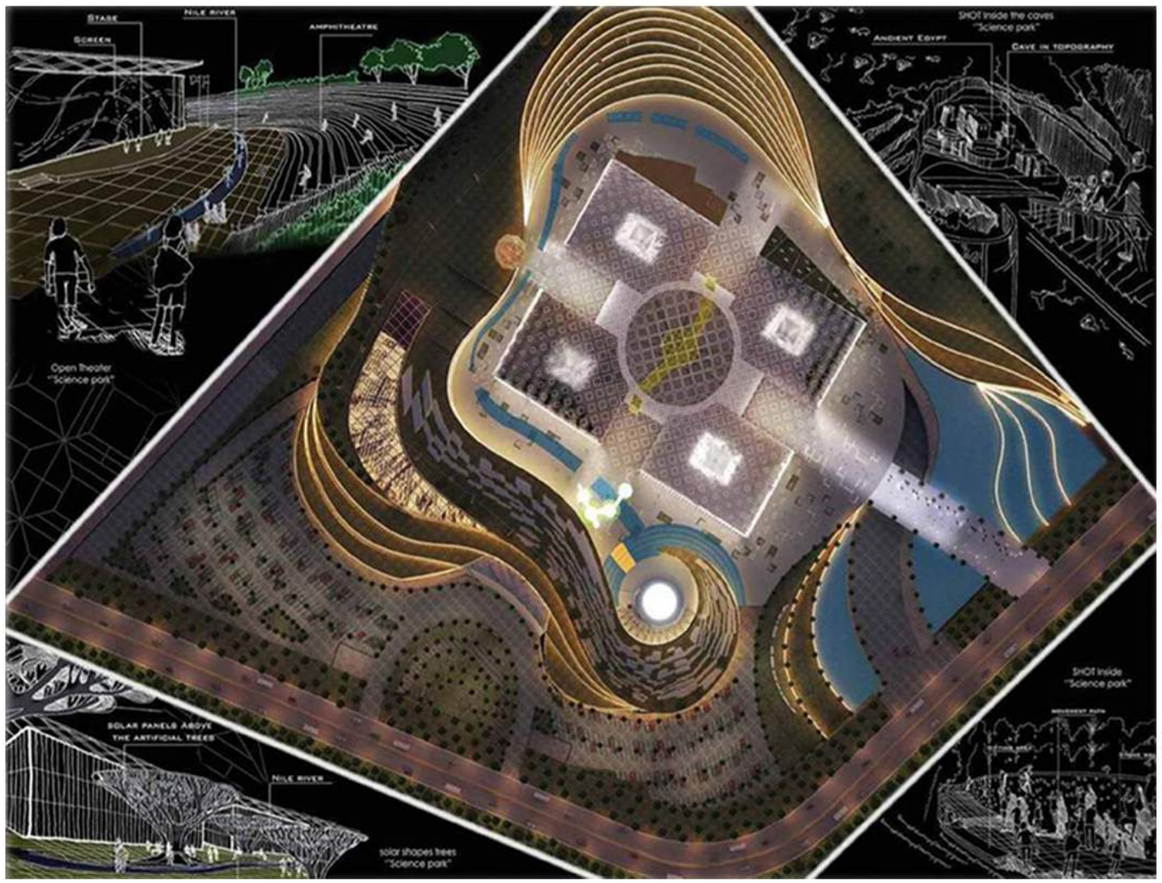
Professional project
Status: Competition
Year: 2020
Role: Design partner

Contribute:
-Assistant designer
-Facade design & panelization
-Sun analysis and study diagrams

Science City

Professional project
Status: Competition
Year: 2016
Role: Design partner

Contribute:
-Assistant designer
-Early concept stage
-Study diagrams



Science City

Professional project
Status: Competition
Year: 2016
Role: Design partner

Contribute:
-Assistant designer
-Early concept stage
-Study diagrams

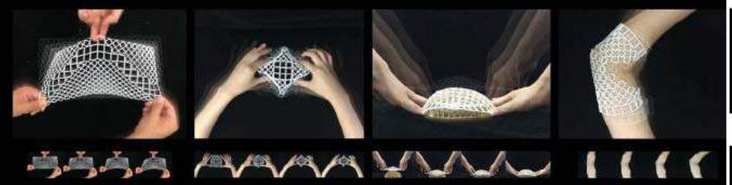
06 PROGRAMMING MATERIAL INTELLIGENCE
响应式生物混合系统 3D 打印

STAGE 1—MATERIAL PATTERN AND BEHAVIOR STUDY

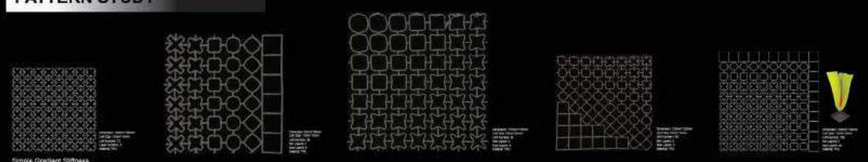
BEHAVIOUR STUDY

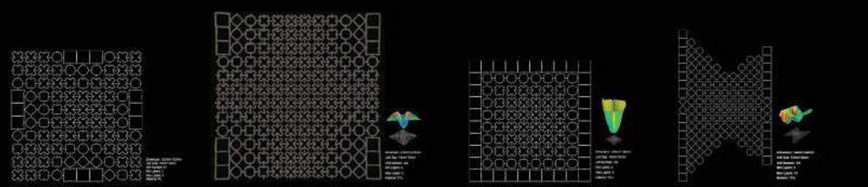
DESCRIPTION

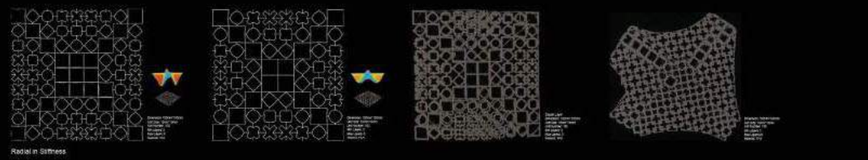
Through designing the material's pattern distribution and stiffness variation, we seek to study its behavior and spatial geometry when an external force is exerted on it. The images on the right show the behavior of the double-curved surface when we apply a pulling, bending, and wrisping force, and the patterns are programmed individually in order to produce the most desirable response to the exerted force. We started experimenting with the simplest gradients in pattern and stiffness, using PLA and TPU. Having concluded that TPU is the more desirable material for our study, we used TPU to explore other possibilities in pattern design, such as radial-out, radial-in and diagonal. At the final stage, we challenged ourselves to think about how the surface can be programmed to be responsive to multiple external forces and their potential applications in the real world.

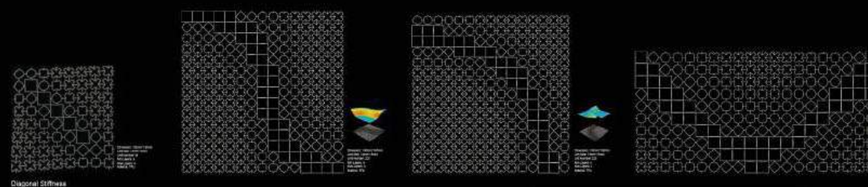


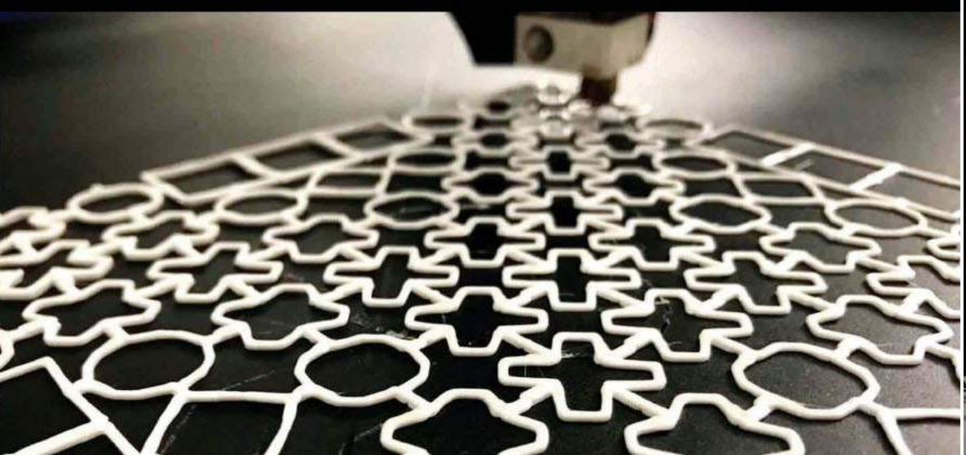
PATTERN STUDY







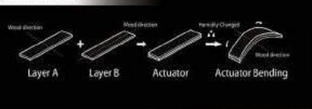




06

STAGE2—EXPLORING THE INTEGRATION BETWEEN ACTUATOR AND MESH BASED ON LARGE 3D PRINTING MACHINE.

METHODS

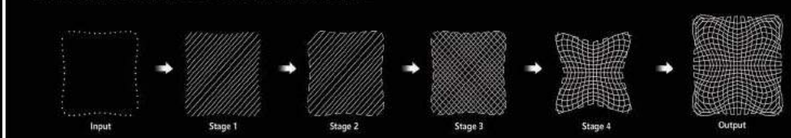


Wood is a CO2 storing material from renewable resources with excellent mechanical properties and a sophisticated hierarchical structure from the nanoscale of cell wall polymers up to the macroscale of tree size. An actuator which is made from two layers of woods with different directions will bend when humidity is changed. In this project we tried to explore mesh moving mechanisms driven by wood actuators based on a large 3D printing machine.

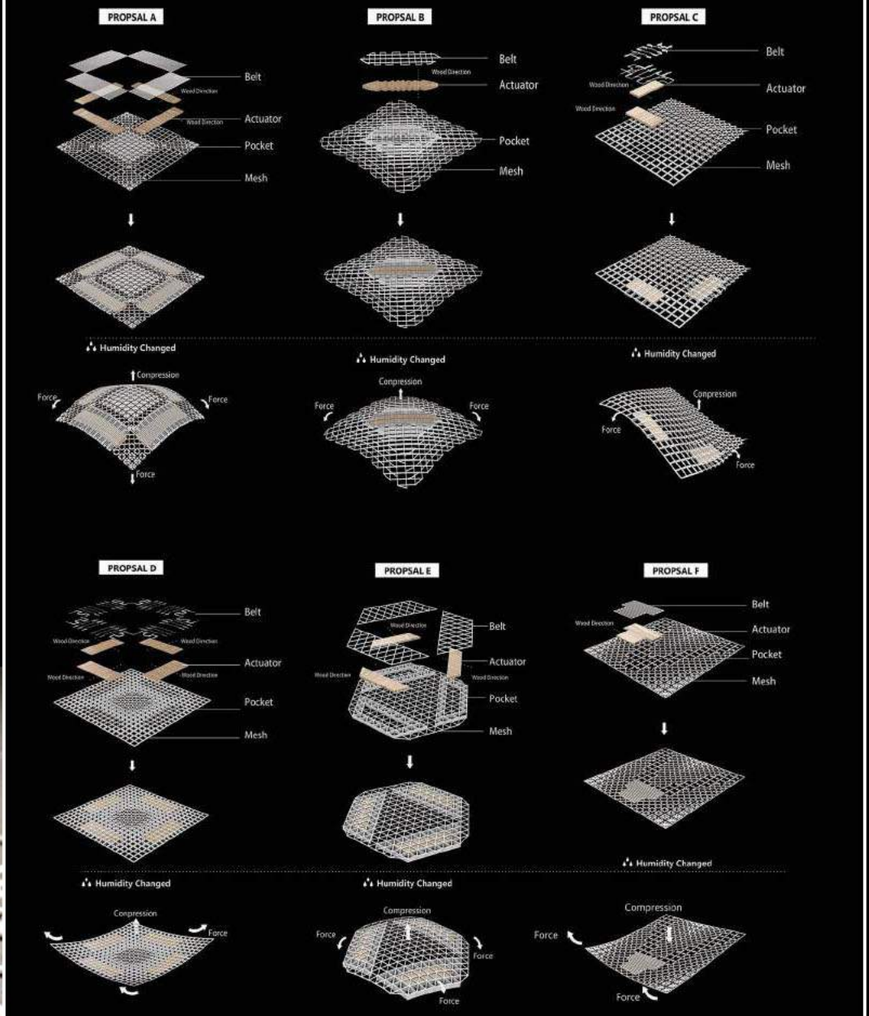
PATTERNS EXPLORATION

1. PATTERNS CONTROLED BY A SURFACE

2. PATTERNS GENERATED BY GRID IN GRASSHOPPER



INTEGRATION



06

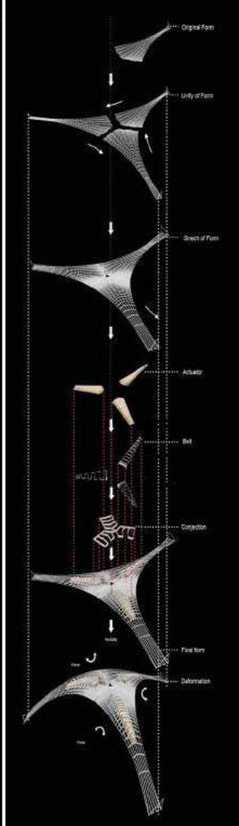
STAGE 3 THE EXPLORATION OF BIO-INSPIRED WOODEN ACTUATORS FOR LARGE SCALE APPLICATIONS

METHODOLOGY

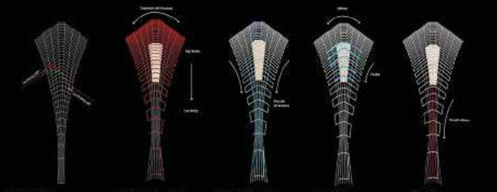
INTRODUCTION

In this study, we seek to explore how bio-inspired materials ,such as wood, make variations to its surronding materials. Wood ,with its natural structure, bending in the humidity environment ,could be made into actuators. For large scale of applications ,the design mainly focus on the combination of wooden actuators and material patterns as well as how the applications response . The patterns are programmed in the Grasshopper individually with certain rules to produce the most desirable one to take advantage of wooden actuators .Through the test of different stiffness and flexiable patterns, the design trys to understand the wooden actuators character. By printing the ABS materials, the study combine the acutators and ABS patterns, exploring the bio inspired movments driven by wooden actuators.

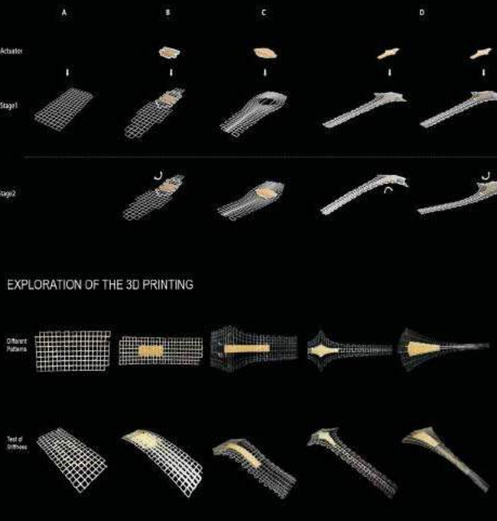
INTEGRATION



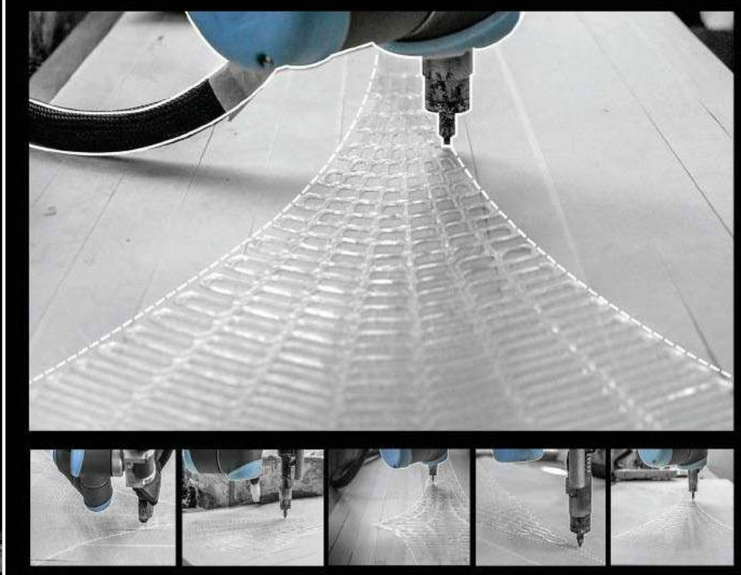
DESIGN PRINCIPAL



EXPLORATION OF THE PATTERN

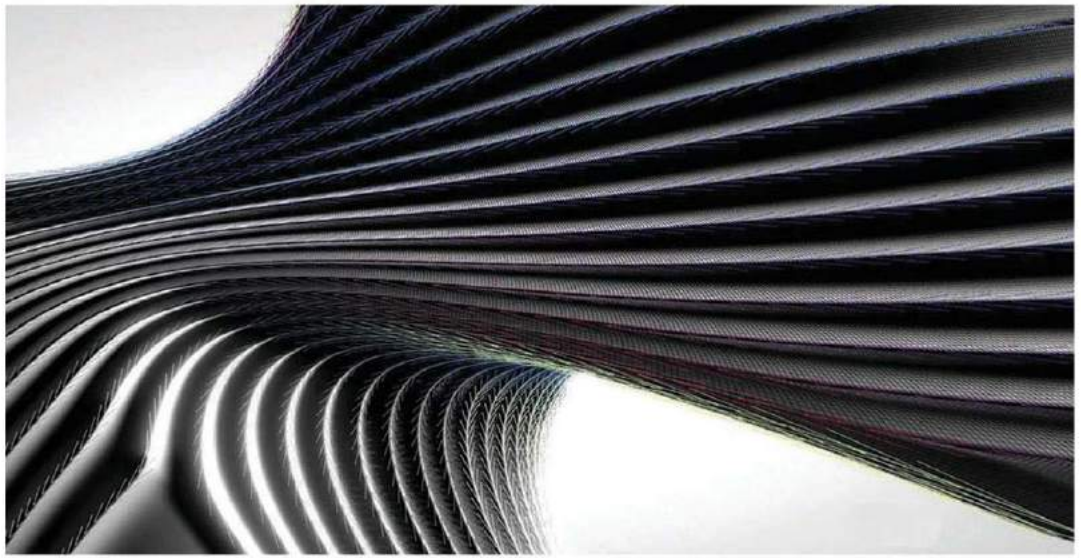


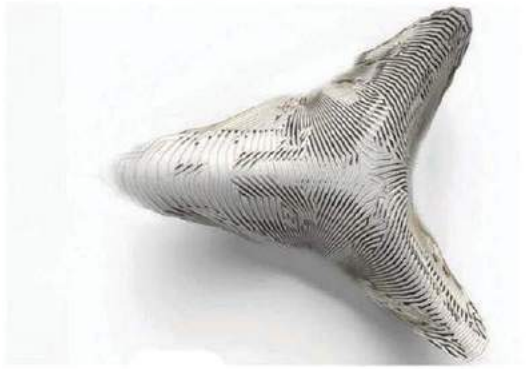
EXPLORATION OF THE 3D PRINTING



Vibearch Workshop

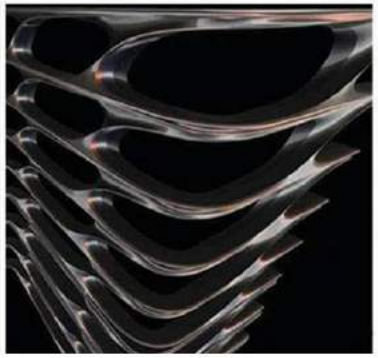
WS1 Learning how to interweave intuitively simple 3D modeling operations with strategies for parametric control of the model's geometry through Rhinoceros 3D and Grasshopper, simulating material systems and forces with the help of its plugins Kangaroo, Weaverbird and Millipede by Alessio Erioli from Co-de-iT

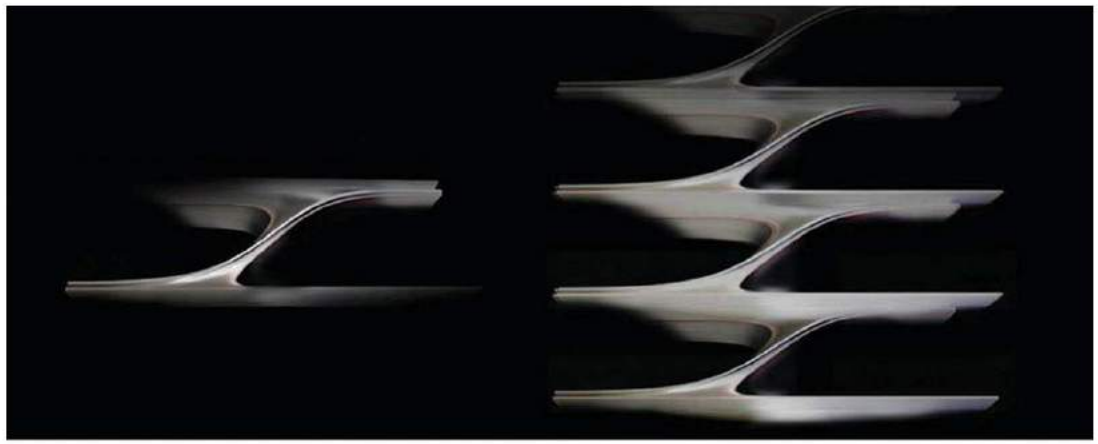




Vibearch Workshop

WS2 explore strategies to design in Maya , systematically with complex geometries following a professional workflow and to be ready to design a massing model for a concept phase or to design the own product design.
Receive an overall of Autodesk Maya finalized to work with low-poly mesh and basic/advanced tools in order to have a final high density mesh ready to be exported in Rhino or 3d printed.A final key exercise will investigate the potential of an high density mesh towards geometrical exploration and designing performance for the output of a FACADE DESIGN LAYOUT for a TOWER by Davide Del Giudice from Zaha Hadid Architects.





Vibearch Workshop

WS3 Activites included familiarization with how to be a designer and not just a renderer.
How to explore striking visual narratives and experiences while highlighting the main architectural design intent and defining the best out of it.How to create fast track draft visual directions that resembles a story board for the client to select the best directions from. How to communicate your ideas efficiently and sell it to the clients. How to build a strong relation with the clients that eventually gives you the freedom and the trust to explore unique visual languages by Karim Mousa El Ramly from Plompmozes