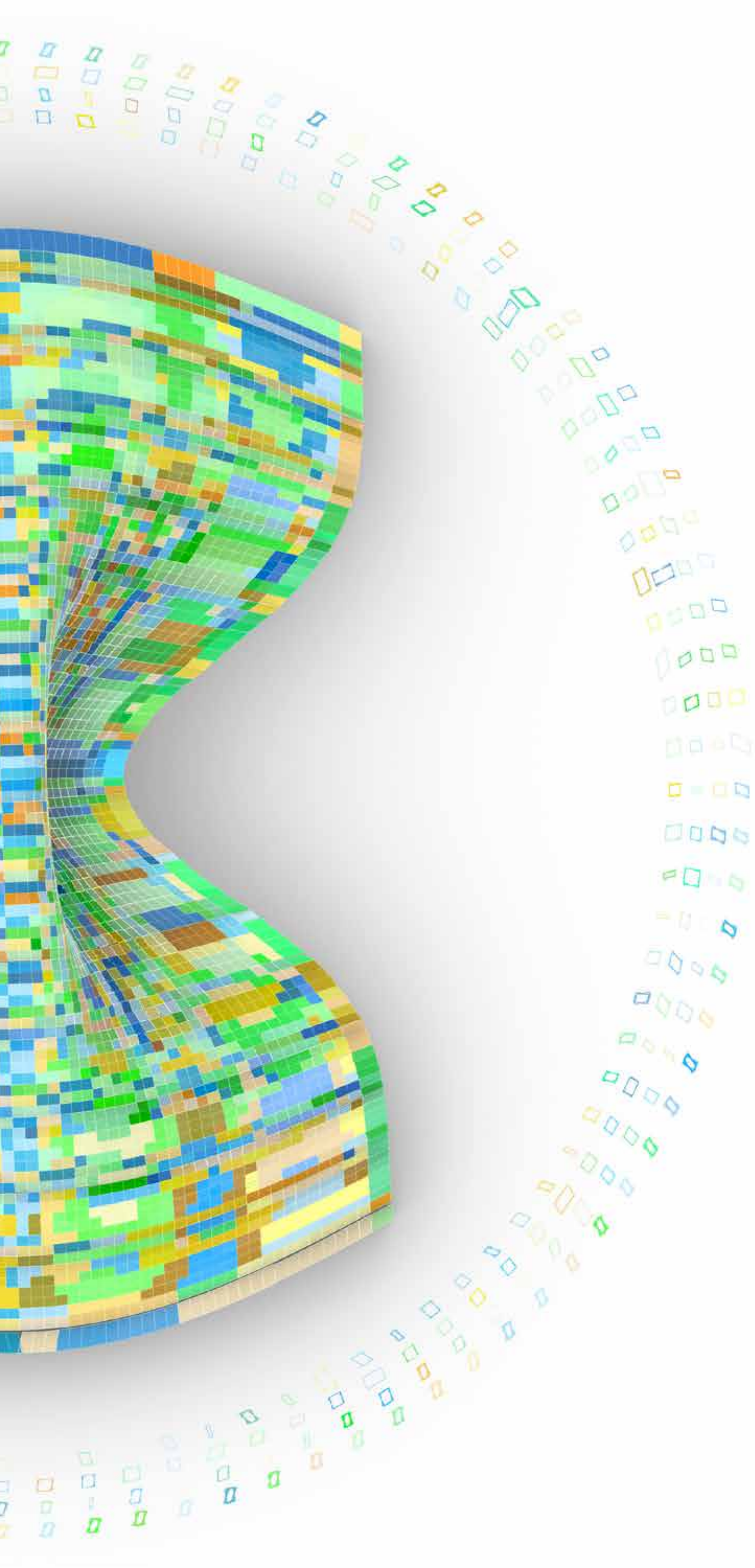




# WSO1



## Infinite Variation to Clustered Optimization

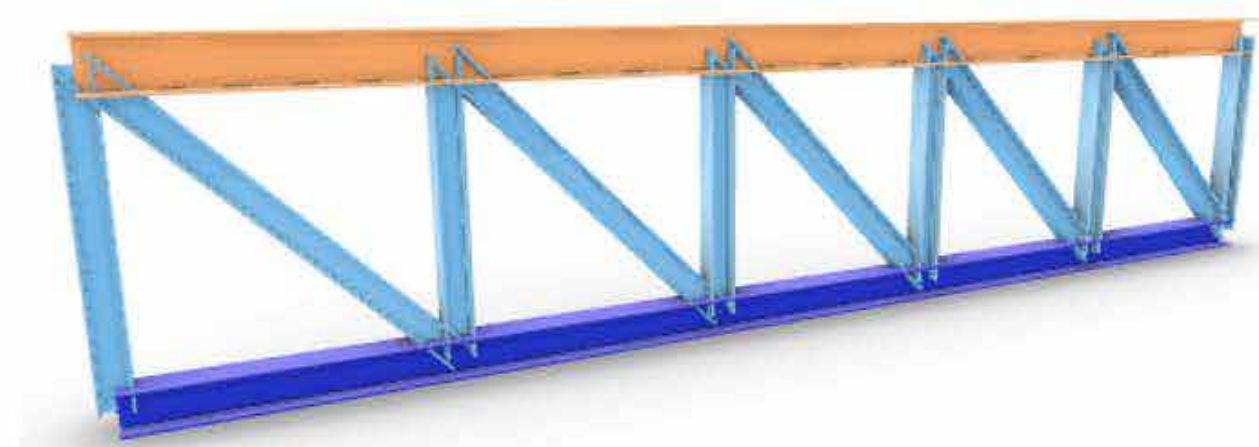
Complex form, panelization, clustering in Python in Grasshopper3D. The workshop will explore some of our recent projects at IAAC, which draw inspiration from the Soumaya Museum in Mexico City. We will utilize parametric equations to generate forms, panelize the surfaces, and then apply clustering techniques such as K-Means or DBScan to minimize variation within the panels.

Tutor · James McBennett | **IAAC Faculty, MaCAD**

Requirements · **Rhino3D 8 / Grasshopper3D / Python**

Capacity · **25 Participants**

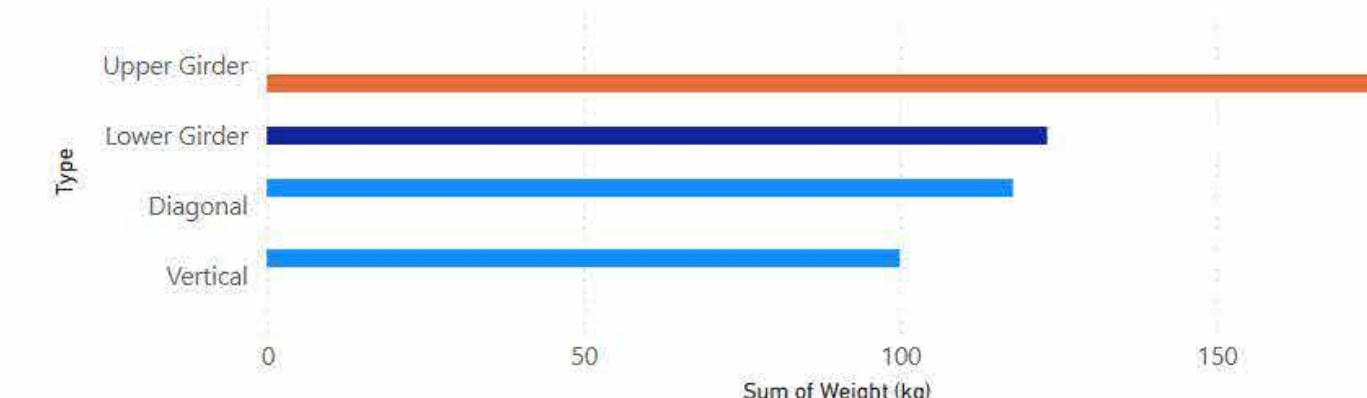
October 26 | 9 – 18h  
Centro de Ingeniería Avanzada  
CU UNAM



| ID            | Weight (kg)   | My (kN/m) | Nx (kN) |
|---------------|---------------|-----------|---------|
| Diagonal10    | 23,58         | 0,00      | -265,84 |
| Diagonal11    | 23,58         | 0,00      | -253,61 |
| Diagonal12    | 23,58         | 0,00      | 152,12  |
| Diagonal13    | 23,58         | 0,00      | 183,50  |
| Diagonal14    | 23,58         | 0,00      | 170,68  |
| Lower Girder5 | 24,66         | -6,55     | -5,78   |
| Lower Girder6 | 24,66         | -1,79     | 182,94  |
| Lower Girder7 | 24,66         | 1,41      | 75,57   |
| Lower Girder8 | 24,66         | 0,90      | -61,98  |
| Lower Girder9 | 24,66         | -3,22     | -190,75 |
| <b>Total</b>  | <b>518,82</b> |           |         |

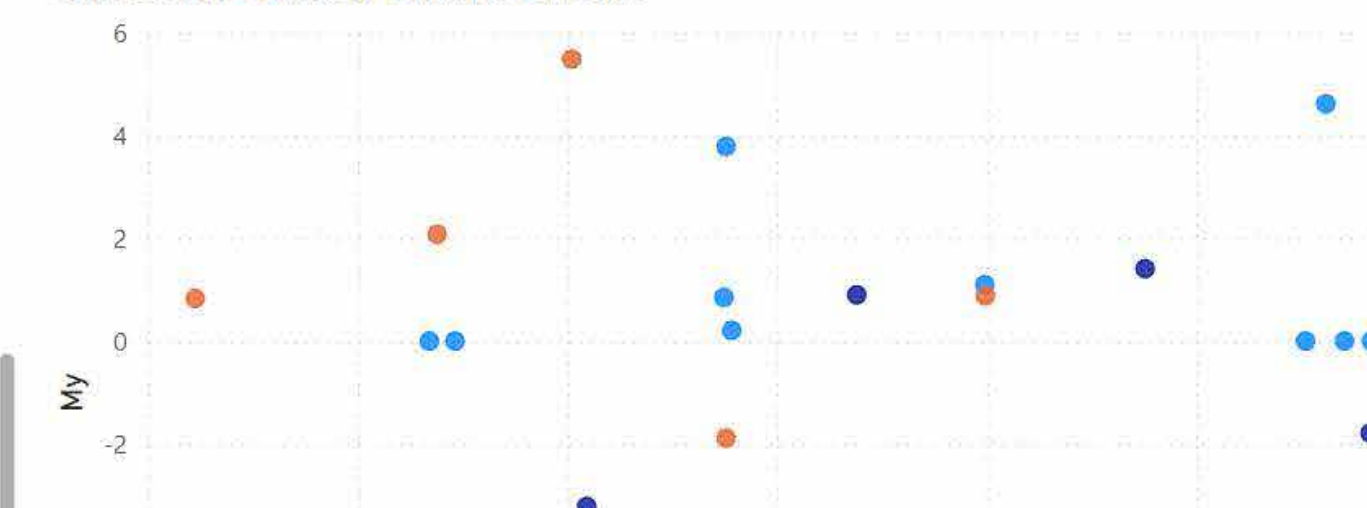
Sum of Weight (kg) by Type and Cross Section

Cross Section ● HEA100 ● HEA140 ● HEA180



Nx (kN) and My by ID and Cross Section

Cross Section ● HEA100 ● HEA140 ● HEA180



# WSO2

## Parametric Engineering: Collaborate and interact with structural data on the cloud

Karamba3D allows for quick, accurate, and parametric finite element calculation. Geometries can be quickly optimized and iterated through parametric processes. Leveraging the Speckle platform, collaboration has been made easier, where structural models can be sent and received from the cloud. The workshop will also explore interactive dashboards in PowerBI where one can access the data from the structural calculation and optimization results from Karamba3D to have a holistic understanding of the models.

The workshop will be taught in a seminar-style format, where the tutors will guide the participants through live demos, and the participants will have the opportunity to experiment with the prepared material.

Tutors · Clemens Preisinger, Matthew Tam and Georg Lobe |  
**University of Applied Arts Vienna, Karamba3D, Bollinger+Grohmann**

Requirements · **Participants should bring their own laptops (windows is preferred) previous knowledge in Rhino/Grasshopper/Karamba3D/Speckle/PowerBI would be greatly beneficial**

Capacity · **25 Participants**



October 26 | 9 – 18h  
Centro de Ingeniería Avanzada  
CU UNAM



# WSO3

## Human Scaffoldings

The Human Scaffolding workshop at IASS25 will investigate how structural understanding can be enhanced through empirical and embodied experience. By taking inspiration from historical human-built formations, such as the Castellers of Catalonia, and engineering solutions like the human-like tilted pillars of Pier Luigi Nervi at the Palazzetto dello Sport in Rome, this workshop will immerse participants in the creation of lightweight structures, in which students are going to be proper components. The main goal of the workshop is to fill the gap between abstract theoretical knowledge and tangible spatial understanding, offering a dynamic and participatory way to explore structural principles. The workshop aligns with the IASS 2025 theme, “The Living Past as a Source of Innovation,” by merging traditional human-based assembly techniques with modern approaches to participatory and interactive learning in structural design. This workshop will equip participants with all the essential skills to efficiently explore new structures using StructuralDesigner.

Tutor · Simone Barbi + Emanuele Cremona | **University of Florence, Italy**

Requirements · **None**

Capacity · **40 Participants**



October 26 | 9 – 18h  
Centro de Ingeniería Avanzada  
CU UNAM



# WSO4

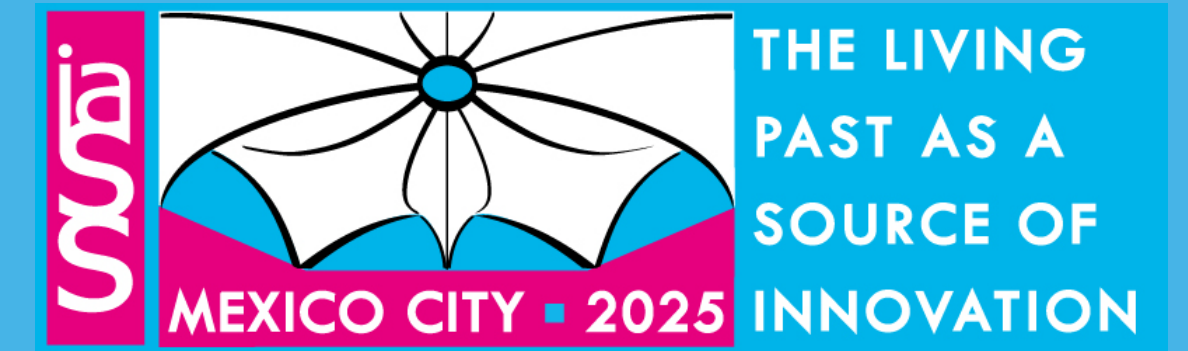
## Membrane Tensegrity Shell Structures

This workshop will show participants how to design Membrane Tensegrity Shell (MTS) Structures. MTS structures consist of a network of discrete struts within a continuous tensile membrane. Unlike typical tensegrity structures MTS structures are relatively easily drawn and modeled since they have only a 2D pattern of struts and a single membrane. Validated MTS design workflows developed by the team will be shown from first principles. Participants will be able to tailor their own MTS's using both physical and digital modes. The attendees will be provided with a kit of parts including fabric for the membrane, and laser cut plastic/plywood for the struts, to create a physical model of their MTS structures. Data from these physical models will be used to determine specific input parameters to the simulation to create a digital twin. Through this digital twin, iterations of designs can then be made that reflect the physical output. Outputs will include 1-3 physical tensegrity models about 30cm square in size and a series of digital designs in Rhino 3d.

Tutors · Kenneth Tracy, Christine Yogiama, Ying Yi Tan + Prerita Jinachandran. |  
**College of Architecture, Art, and Design American University of Sharjah, UAE |**  
**Canadian University of Dubai | Singapore University of Technology and Design**

Requirements · **Personal laptop (windows is preferred) previous knowledge in Rhino/Grasshopper/Karamba3D/Speckle/PowerBI would be greatly beneficial**

Capacity · **25 Participants**



October 26 | 9 – 18h  
Centro de Ingeniería Avanzada  
CU UNAM



# WSO5

## Street Data Insight

In this workshop, participants will employ remote resources to develop a detailed and efficient understanding of the inherent complexity of architecture within cities. The workshop will introduce to the use of digital tools for the construction of urban and architectural profiles for surveying structures of interest and heritage, based on the collection and processing of panoramic images as a complement to the study of public space and informed decision-making.

In the workshop we will explain basic principles and technical concepts to contextualize the tool and its relevance in urban-architectural buildings and structures analysis. Presentation of methodologies for panoramic representation, geospatial data integration, and perspective conditions. Practical and Guided Application: Installation and configuration of software, Instruction on the workflow, components, and parameters of the Street Data Insight tool.

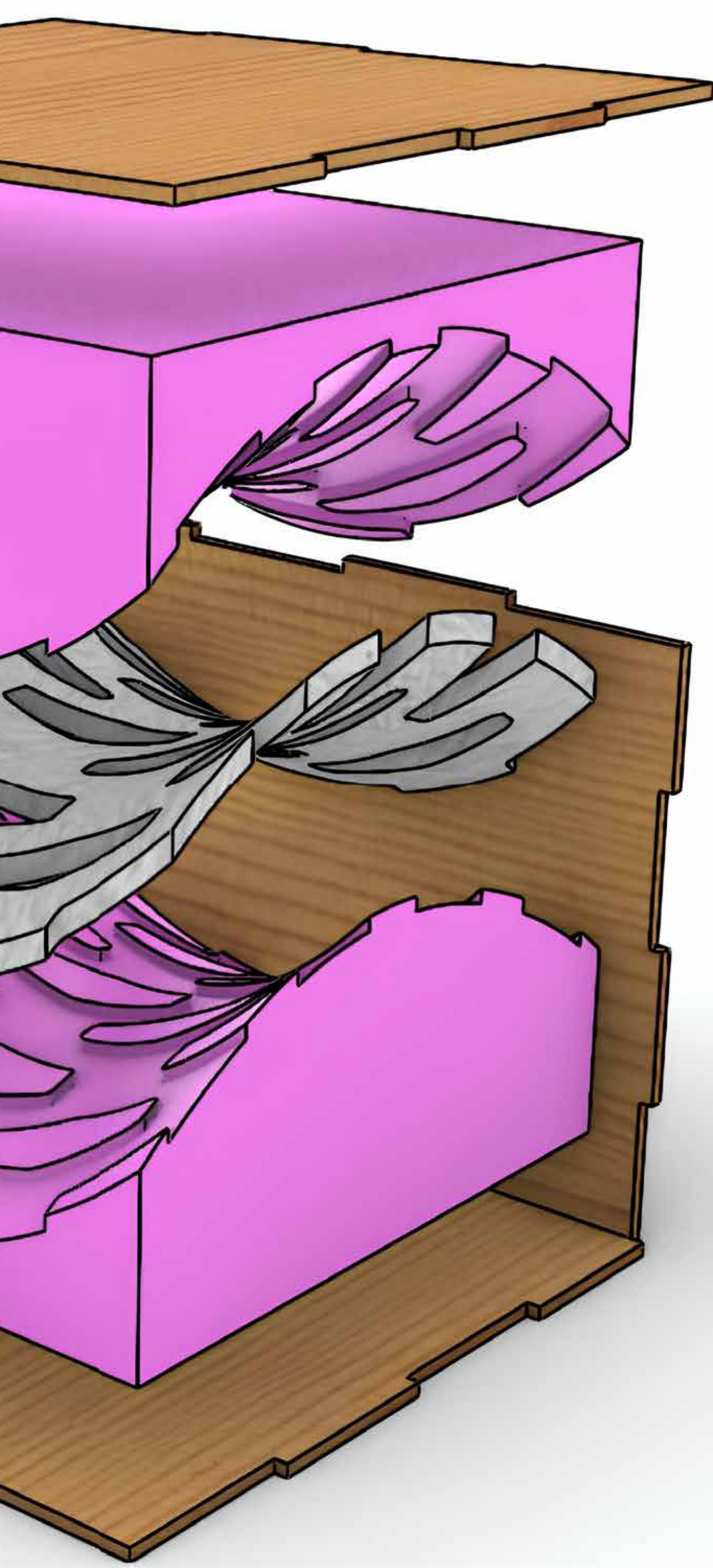
Tutor · Edgar Zambrano | **UNAM**

Requirements · **Rhinceros 7, basic knowledge of Grasshopper workflow. image editing software, such as Photoshop or GIMP.**

Capacity · **20 Participants**



October 26 | 9 – 18h  
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# WSO6

## Cacomixtle: Parametric Plugin for the Design of Complex Geometry Molds

This workshop introduces participants to the parametric design and segmentation of molds for double-curved precast concrete elements using Rhino and Grasshopper. Leveraging the custom plugin Cacomixtle, the session focuses on automating key tasks such as orientation, segmentation, rib layout, counter-mold generation, and panel detailing.

The workshop emphasizes the integration of computational design with manufacturing workflows, promoting better communication between digital modeling and technical fabrication teams. The relevance lies in addressing the growing need for adaptable, precise, and scalable tools in the prefabrication industry. Teaching intent includes hands-on training with algorithmic modeling strategies and digital simulations for optimizing production processes.

Tutors · Enrique Hernández | **UNAM**

Requirements · **Basic knowledge of Rhino and Grasshopper. Personal laptop (Windows 10 or 11 (64-bit), Intel Core i7 or AMD Ryzen 7 equivalent, Minimum 16 GB of RAM), Graphics: Dedicated GPU recommended w/ 10 GB of free space, Rhino 8**

Capacity · **20 Participants**