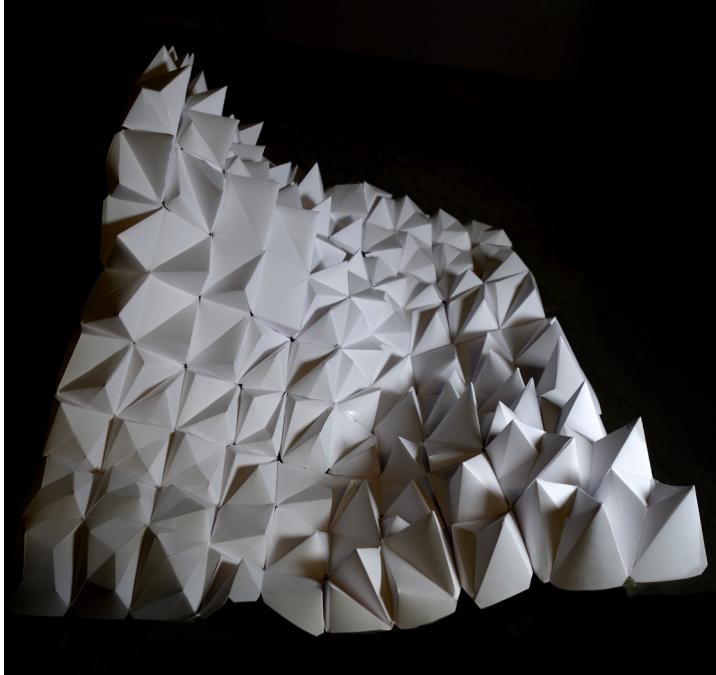




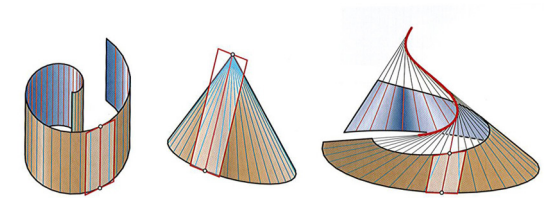
Foundations of Design : Representation, SEM1, 2018
M3 JOURNAL - PATTERN vs SURFACE

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933751
Emmanuel Alexander Cohen, Studio 24

WEEK 6 READING: SURFACES THAT CAN BE BUILT FROM PAPER IN ARCHITECTURAL GEOMETRY

Question 1: What are the three elementary types of developable surfaces? Provide a brief description. (Maximum 100 words)

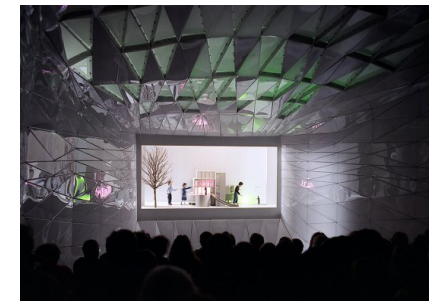
- Cylinders : formed by a family of parallel lines or rulings, which are extruded along a profile curve.
- Cones : formed by rulings which spans from a curve to a single vertex point. The development of the curve is a circular arc.
- Tangent surfaces of space curves: tangent surfaces are formed by different points of tangents along a space curve.



Left to right: Cylinder, Cone, Tangent surface

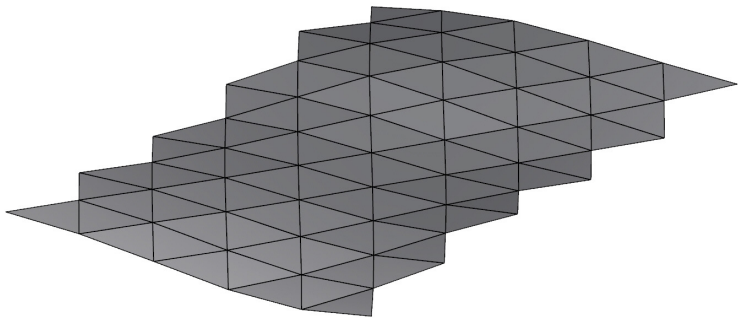
Question 2: Why is the understanding of developable surface critical in the understanding of architectural geometry? Choose one precedent from Research/Precedents tab on LMS as an example for your discussion. (Maximum 100 words)

- The importance of understanding developable surface in the apprehension of architecture geometry can be demonstrated by the Puppet Theatre by Le Corbusier. The use of developable surfaces of diamonds in this project simplifies the construction process but still retains its aesthetics. With this method, the figure also retains a strong and rigid structure, due to the interlocking of each individual panel.

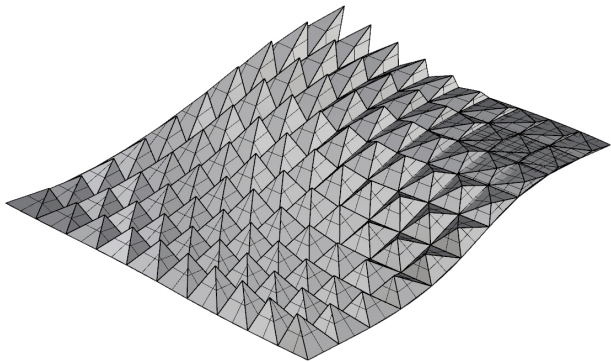


Puppet Theatre by Le Corbusier.

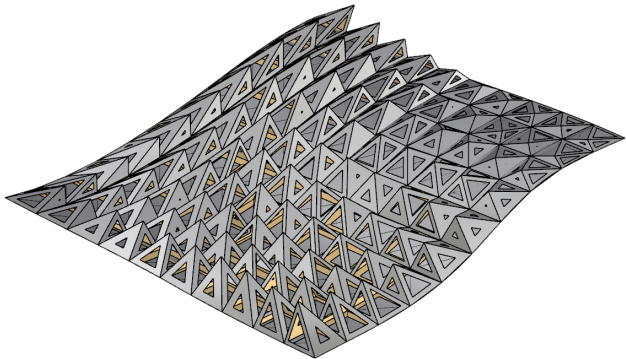
PANELLING PATTERN



2D Paneling, Pattern: Triangular.

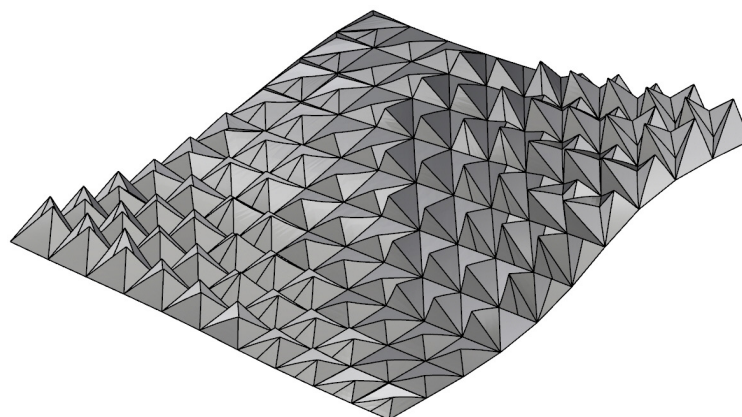
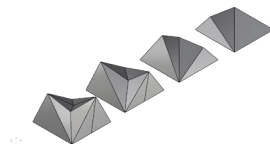


3D Paneling, Pattern: Simple Pyramid.

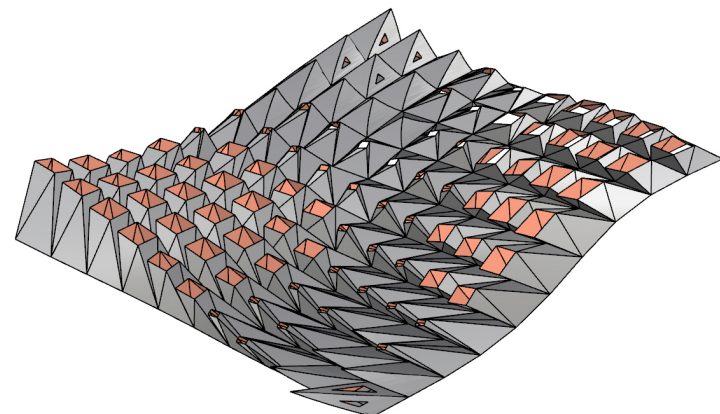
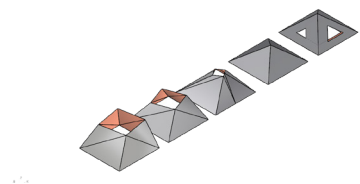


3D Paneling, Pattern: Modified Pyramid.

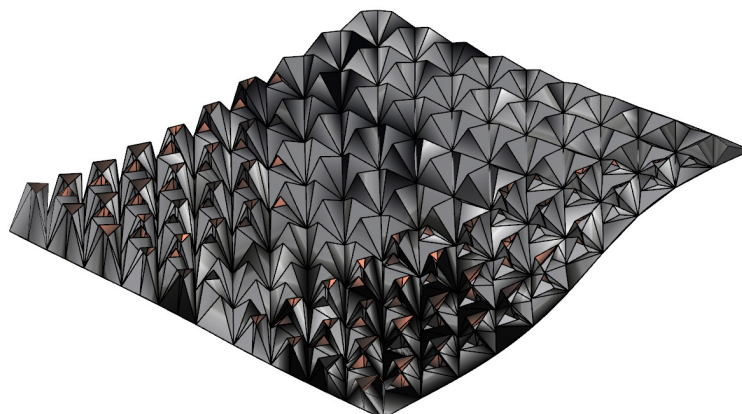
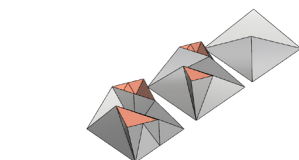
VARIABLE 3D PATTERN



5 Point Attractors (1 on the left corner, 4 on the right corner); 4 Model Variable.

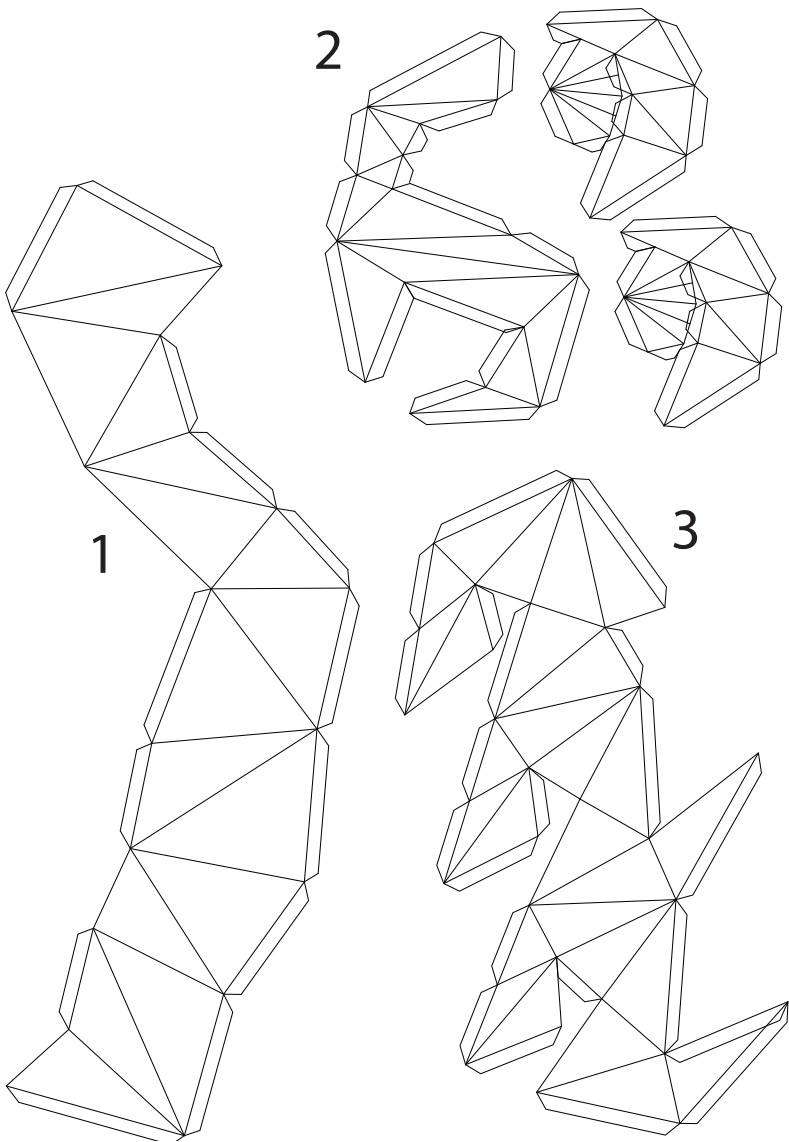


7 Point Attractors, 5 Model Variables, rotated upper grid.

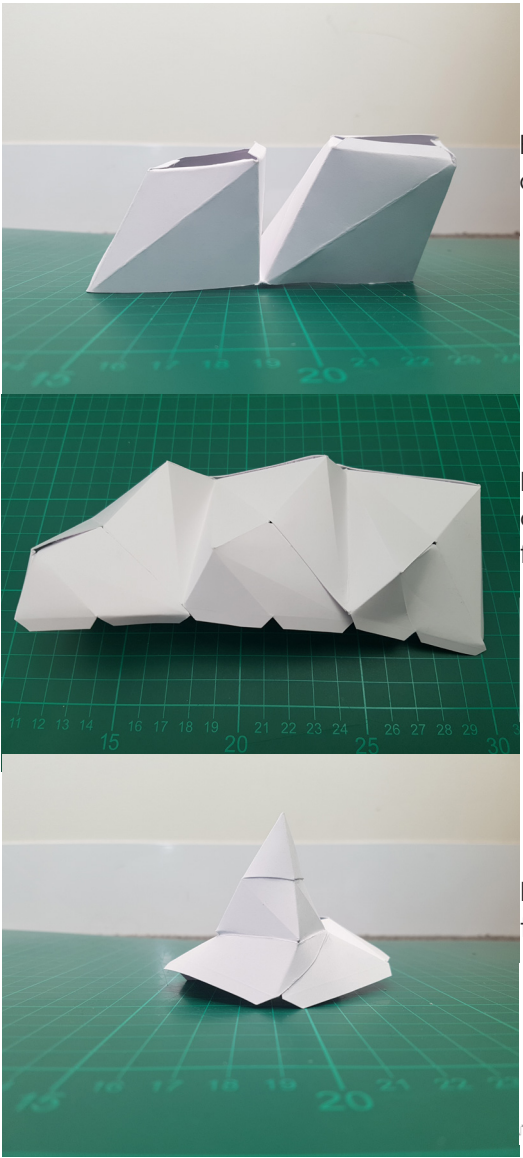


1 Curve Attractor, 3 Model Variables.

3D PANEL TEST PROTOTYPE & TEMPLATE

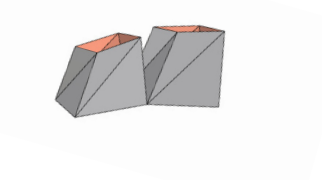


3D Model Trials cut template.
(Number corresponds with the images on the right)

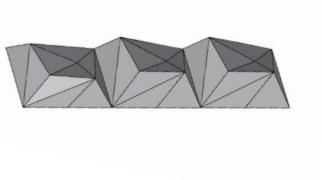


3D Model Trials constructed.

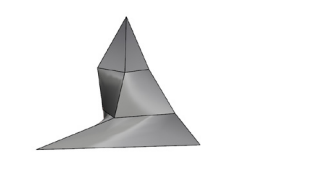
Prototype 1: Simple cut pyramid, resembling volcano.



Prototype 2: Integration of a double pyramid, used in the final model.



Prototype 3: Complex structure of integrated pyramid.



WEEK 7 READING: DIGITAL FABRICATION

Complete your reading before attempting these questions:

Question 1: What is digital fabrication and how does it change the understanding of two dimensional representation? (Maximum 100 words)

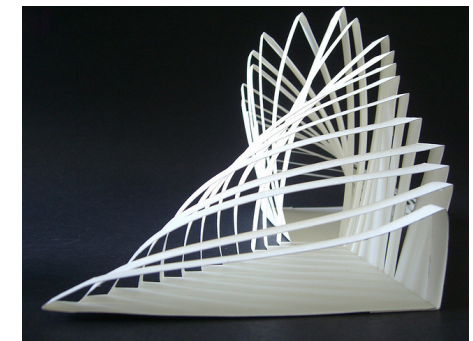
- Digital fabrication is a type of manufacturing process where the machine used is controlled by a computer instead of a person, that combines 3D modeling or CAD with additive and subtracting manufacturing (upstream and downstream). Digital fabrication enables the representation of 3D shapes on a 2D surface by unfolding the shapes on the 2D surface.



Digital Fabrication.

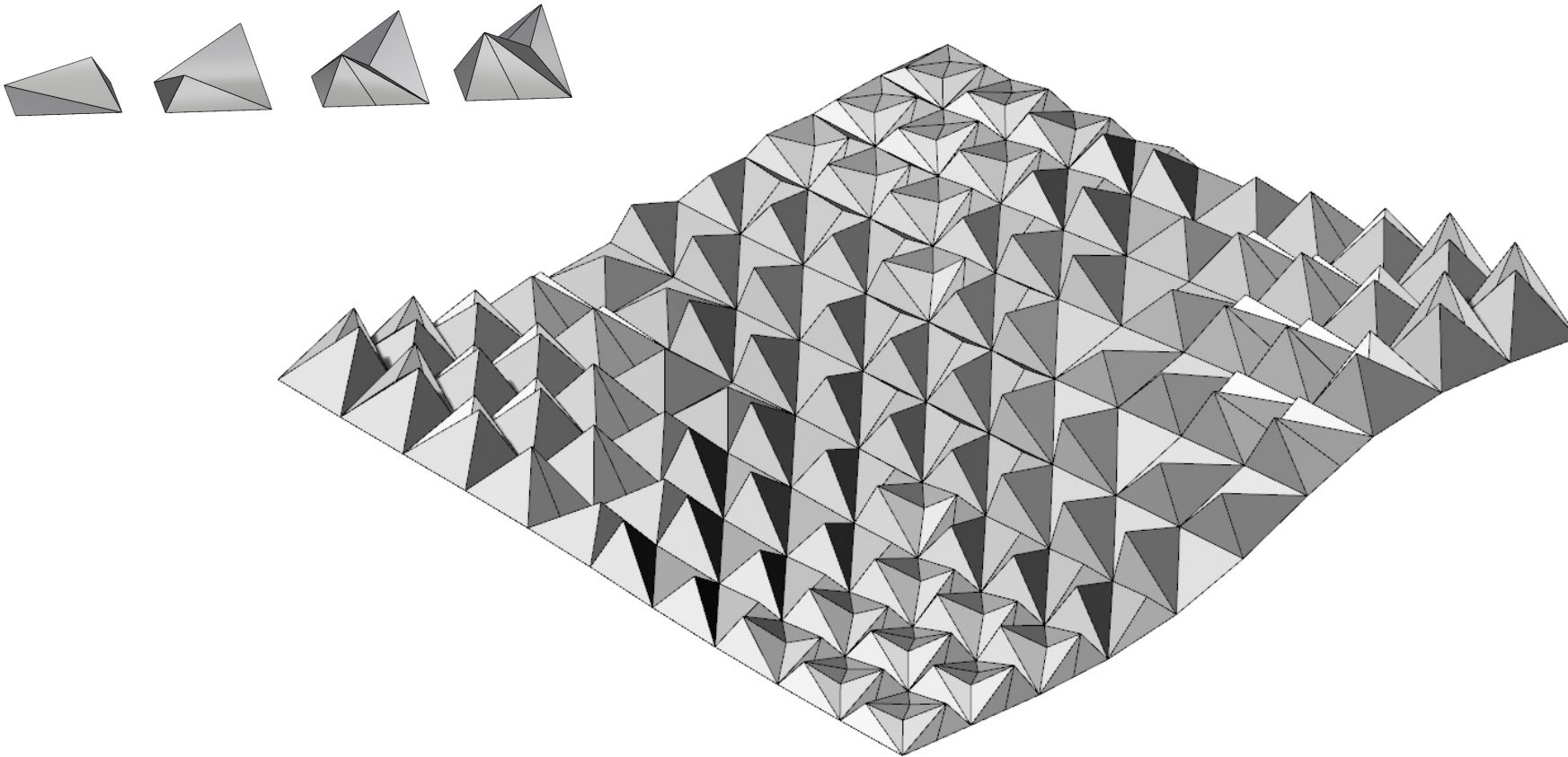
Question 2: Suggest two reasons why folding is used extensively in the formal expression of building design? (Maximum 100 words)

- Folded surface is strong/stable. Because of its 'feet' of its 3D shape, it self-supporting, rigid, and stiff.
- Folding is materially economical but especially appealing. Folding is used by architects to design constructable complex 3D structures.



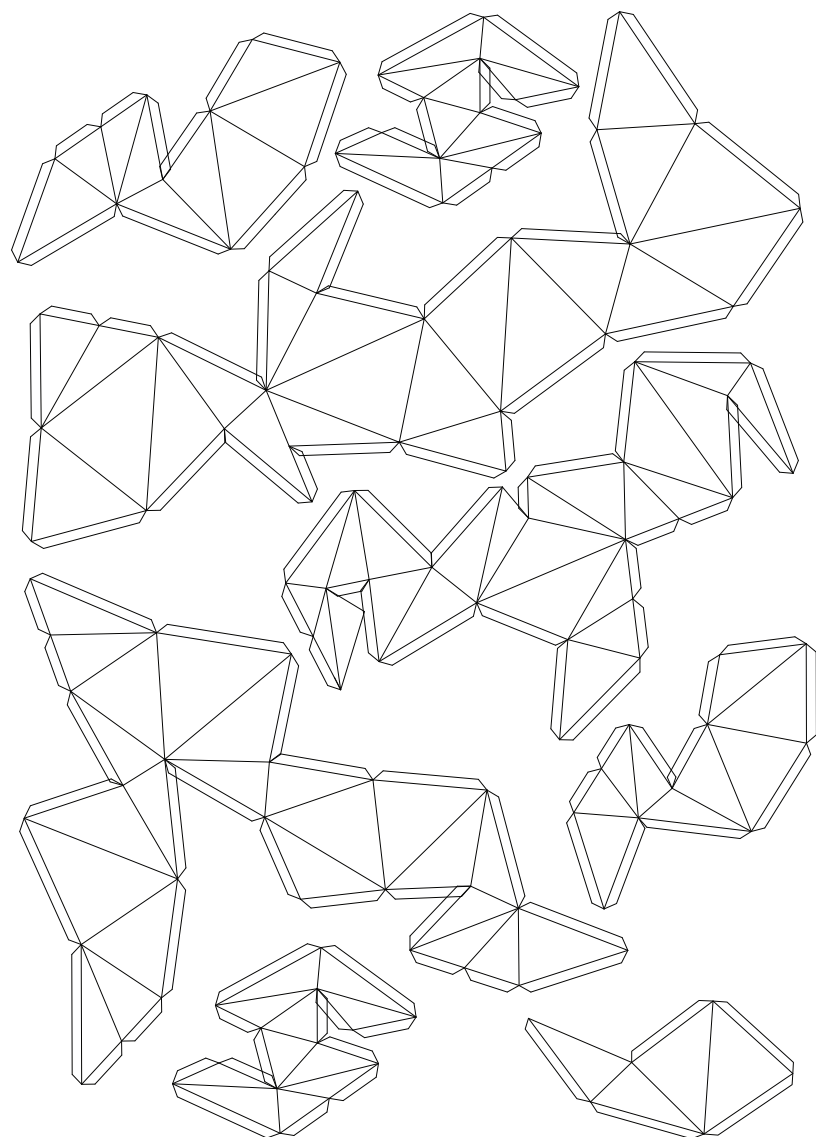
The use of folds that portrays a strong structure with retaining its beauty.

EXPLORING 3D PANELLING

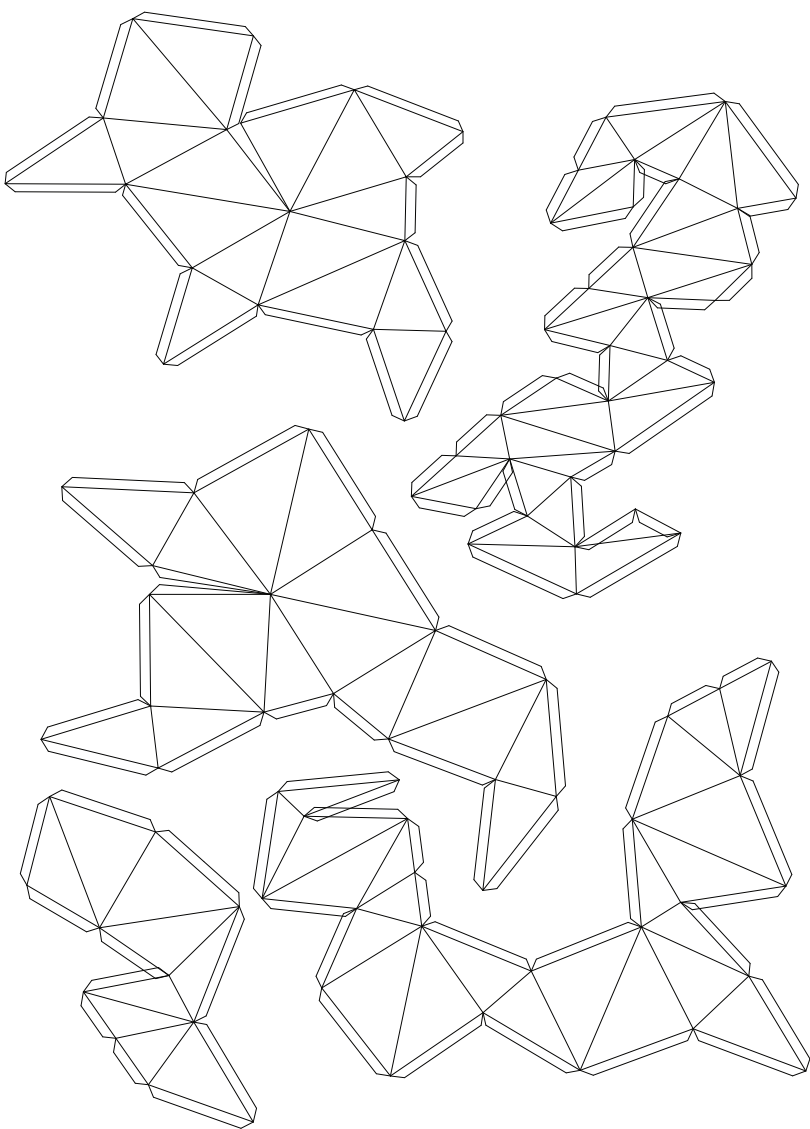


This paneling pattern is made with 4 point attractors for the height and 2 point attractors for the 3D Paneling variables. This iteration emphasises on the evolution of pattern from complex structures to simple ones; and vice versa. The direction of the models throughout the terrain changes. It is achieved by mirroring the four objects above and selecting them one by one from one end to another, obtaining eight object variables in total.

UNROLL TEMPLATE OF YOUR FINAL MODEL

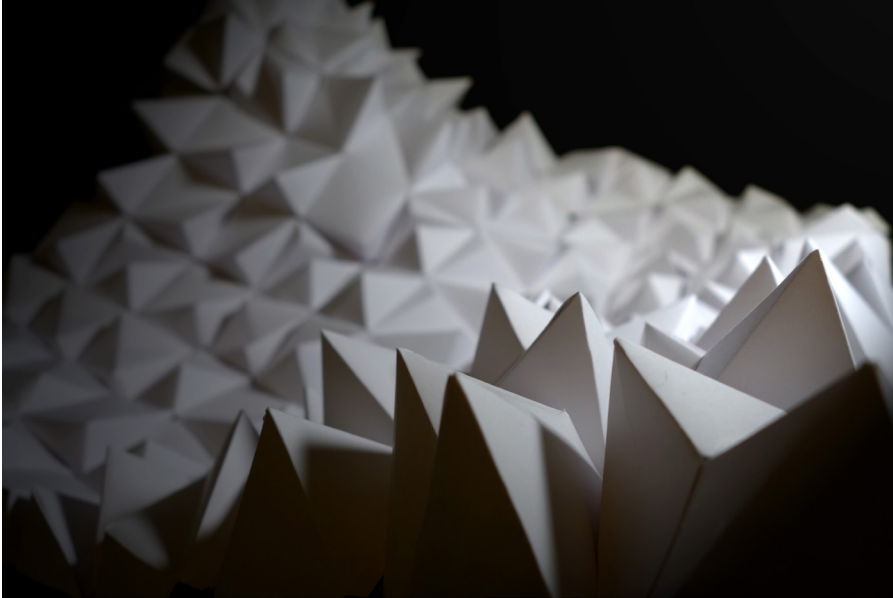


Cut template of 3D model.

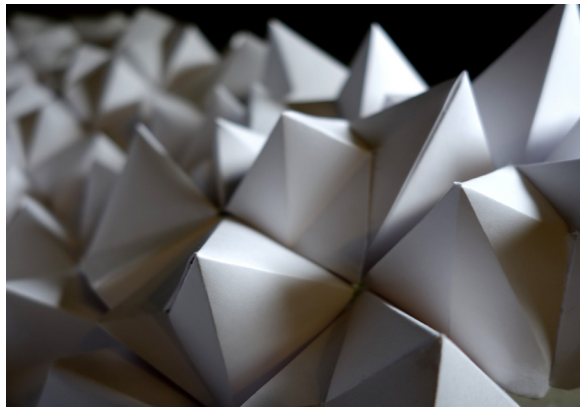


Cut template of 3D model.

PANELISED LANDSCAPE



A close-up view of the model, focusing on the front models.

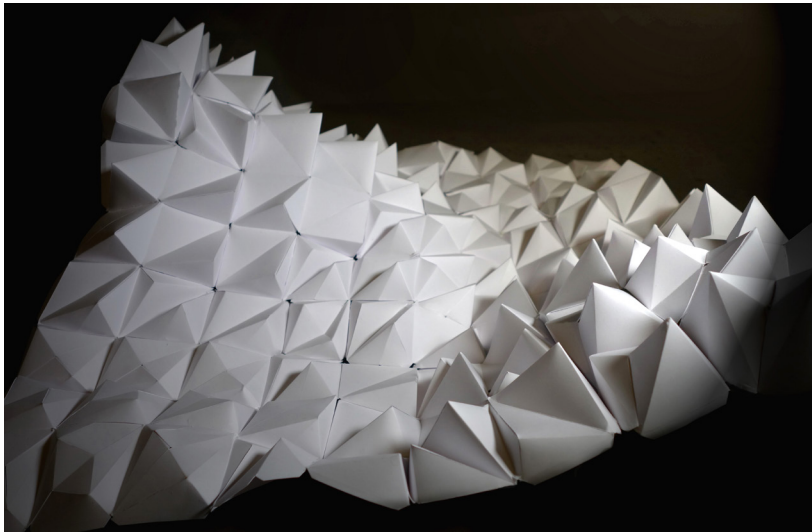


An intimate view of the model, emphasizing the construction of the model.

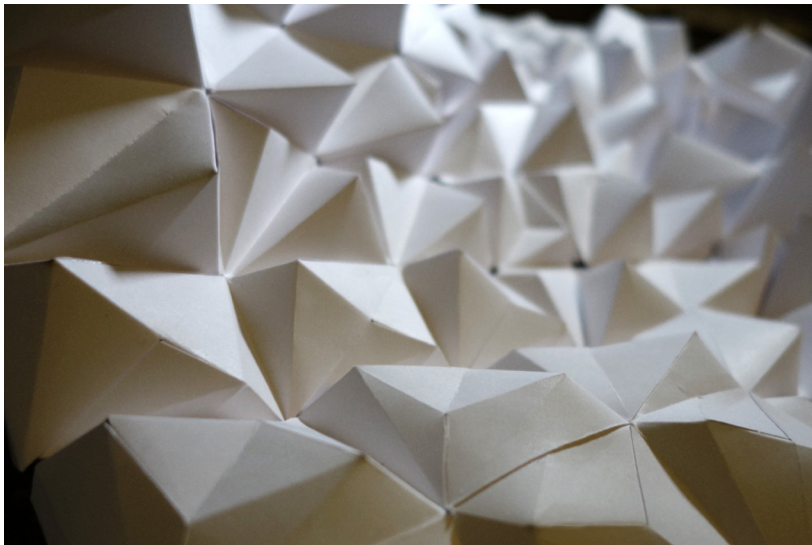


A perspective view of the model, showing the shadows casted due to the height variations of the model.

PANELISED LANDSCAPE



An overall view of the panel, showing the gradation of model and height variation.

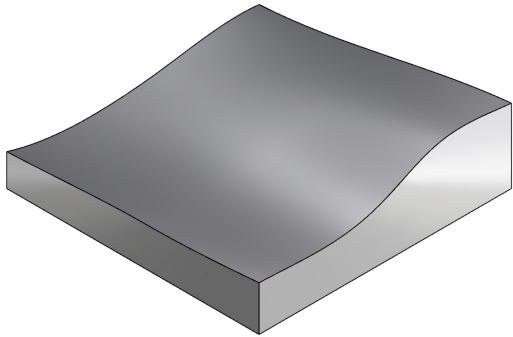


A close-up view showing the complexity of the model.

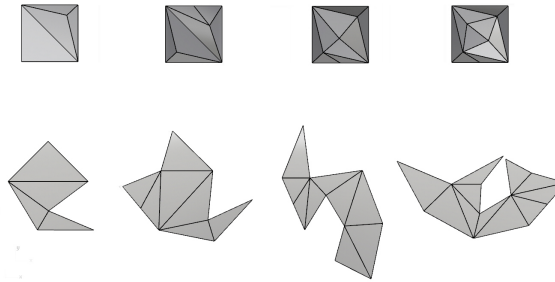


Another intimate view of the model showing a clear construction.

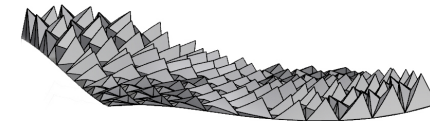
APPENDIX



Shaded picture of Terrain.



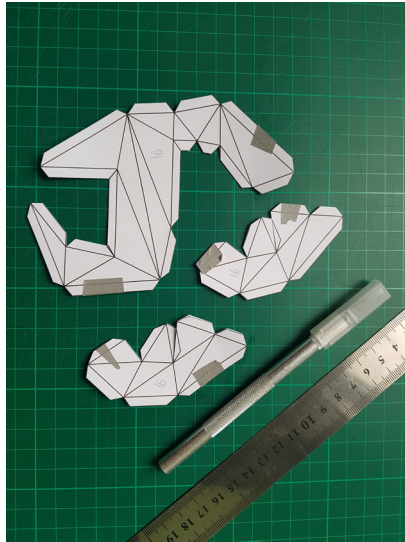
Shape of Model, unrolled and constructed.



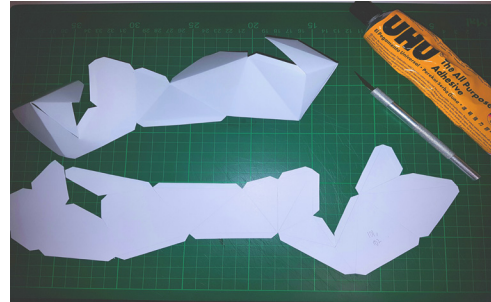
Side view of Panelled Terrain.



Constructed Models.



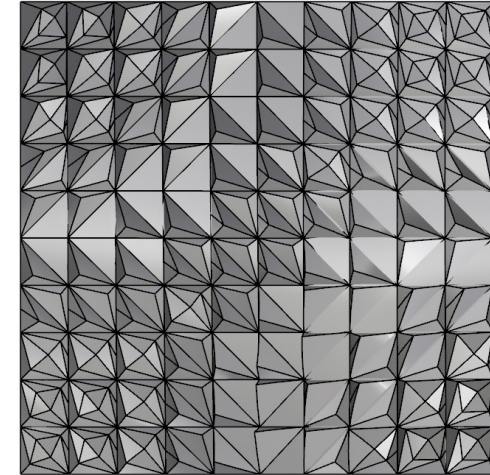
Taped labelled-A4 sheets and ivory card.



Cut fragments .



Unjoined 3D Models.



Topview of Panelled Terrain.