

Patterned Skins

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Intro

In *Parametric Patterns*, Patrik Schumacher explores patterns' potentials as an articulation device that depends upon differentiation and correlation. As one of many possible differentiation methods, of interest for this exhibit, are those which respond to the natural environment and are found in "adaptive differentiation." Schumacher states, "Another powerful opportunity is the adaptive differentiation of facades with respect to environmental parameters that vary widely according with the orientation of the surface. Here, functional and formal variation go hand in hand. The gradual variation of sunlight intensity on a curved surface translates into a gradient transformation of the component formation."¹ It is within this framework that the first year first semester design studio titled Patterned Skins at the Pontifical Catholic School of Architecture is developed. Patterns' potential in relation to a skin's reactive capabilities is seen as an artistic device. The process is developed in three main exercises: Pattern Generation, Space Generation/Reactive Response, Garden Pavilion.

Pattern Generation

Understanding pattern as an "arrangement of repeated or corresponding parts,"² pattern generation offers an alternative and contemporary insight of composition. Through pattern generation a set of guiding principles and rules are established in creating new potentialities in architectural design; Potentialities that deal with geometric modeling techniques in surface generation and structuring. Pattern generation explores the two dimensional complexities of repetitive systems. As a first step, students selected a pattern from Italian and

Arabian mosaics and studied their hidden geometries and concepts through analytical drawings. Secondly, they designed a new pattern based on the ideas discovered from the reference pattern.

Space Generation/Reactive Response

The second phase explored patterns' potentialities in space definition. A bi-dimensional pattern can become the set of guiding principles in the development of a skin that functions as both structure and surface. Its surface qualities, such as transparency and texture, can be manipulated in order to react to different conditions and levels of information. Patterns' potential to react to light, visual access, scale, among others, allows the pattern to transform geometrically through subtle differentiation. As a first step, students developed a space and fabricated it using rhino paneling tools to apply the patterns designed in the previous phase. Secondly, students explored surface qualities by manipulating pattern in terms of light filtration and visual access.

Garden Pavilion

The third phase of the project focused on the application of patterned skins in a real site. The selection of the site was Plaza de Las Delicias in Ponce, Puerto Rico and the program to resolve was a Plant Pavillion. Students analyzed sunlight patterns and applied passive design strategies in order to correlate both the external light resources and interior light requisites established by the content of plants. Different plants required of more sun as other required less, and therefore a correlative relationship was established among the different design components.

Notes

¹ Patrik Schumacher. "Parametric Patterns", *AD Patterns of Architecture* 79, No 6 (November / December 2009): 36.

² pattern. Dictionary.com. *Collins English Dictionary - Complete & Unabridged 10th Edition*. HarperCollins Publishers. <http://dictionary.reference.com/browse/pattern> (accessed: May 20, 2012).

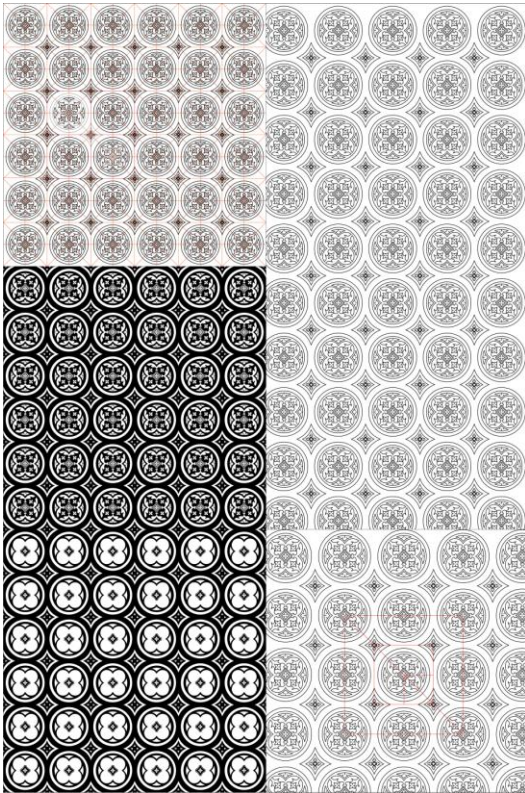


Fig.1: Pattern Generation, Italian Pattern

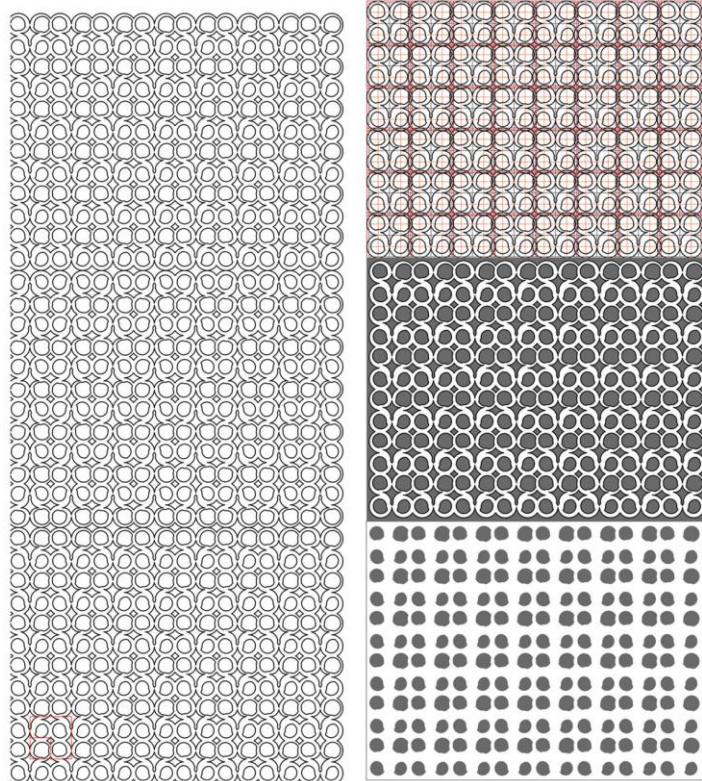


Fig. 2. Exercise 1: Pattern Generation

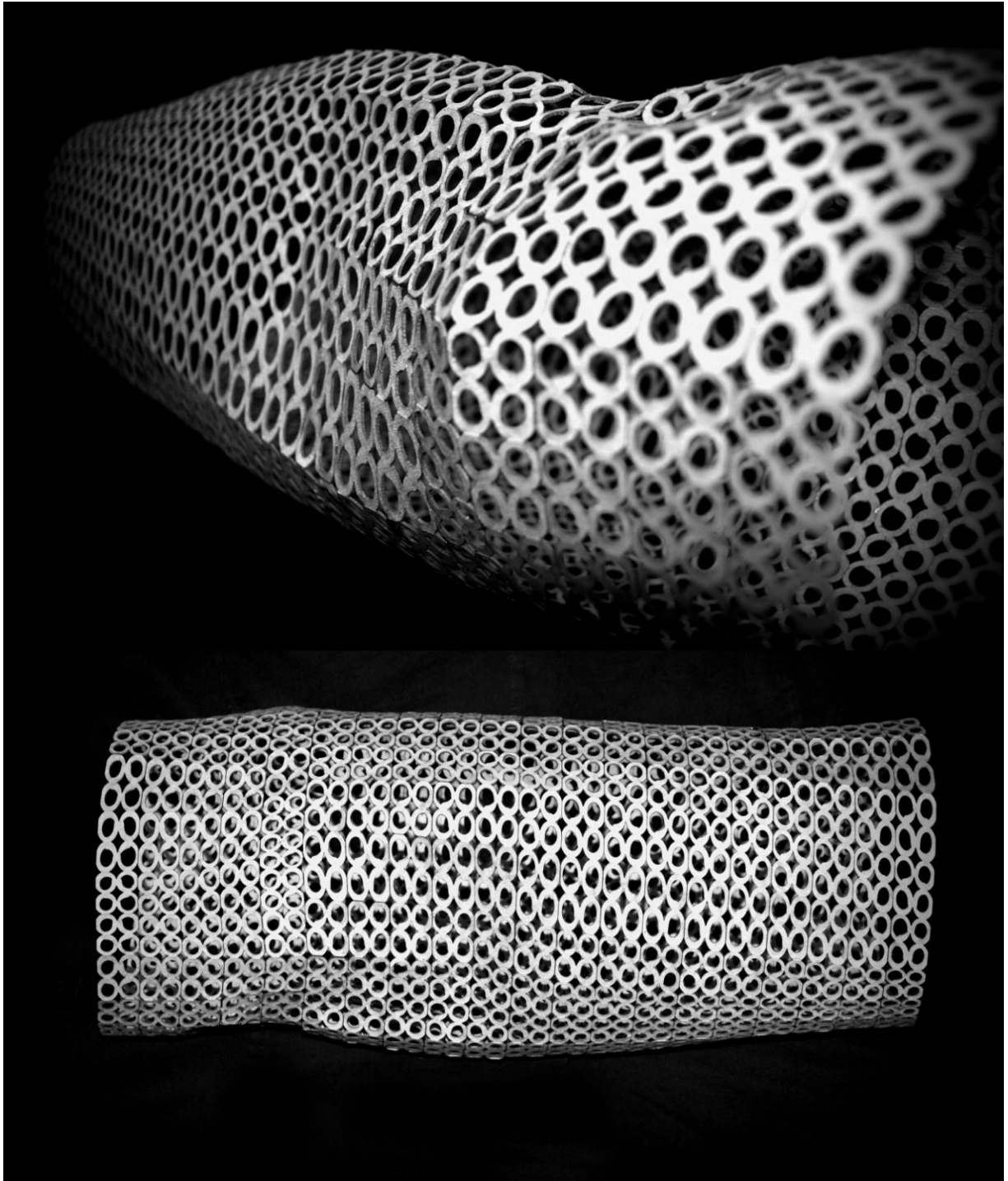


Fig. 3 Exercice 2: Space Generation (Fabrication)

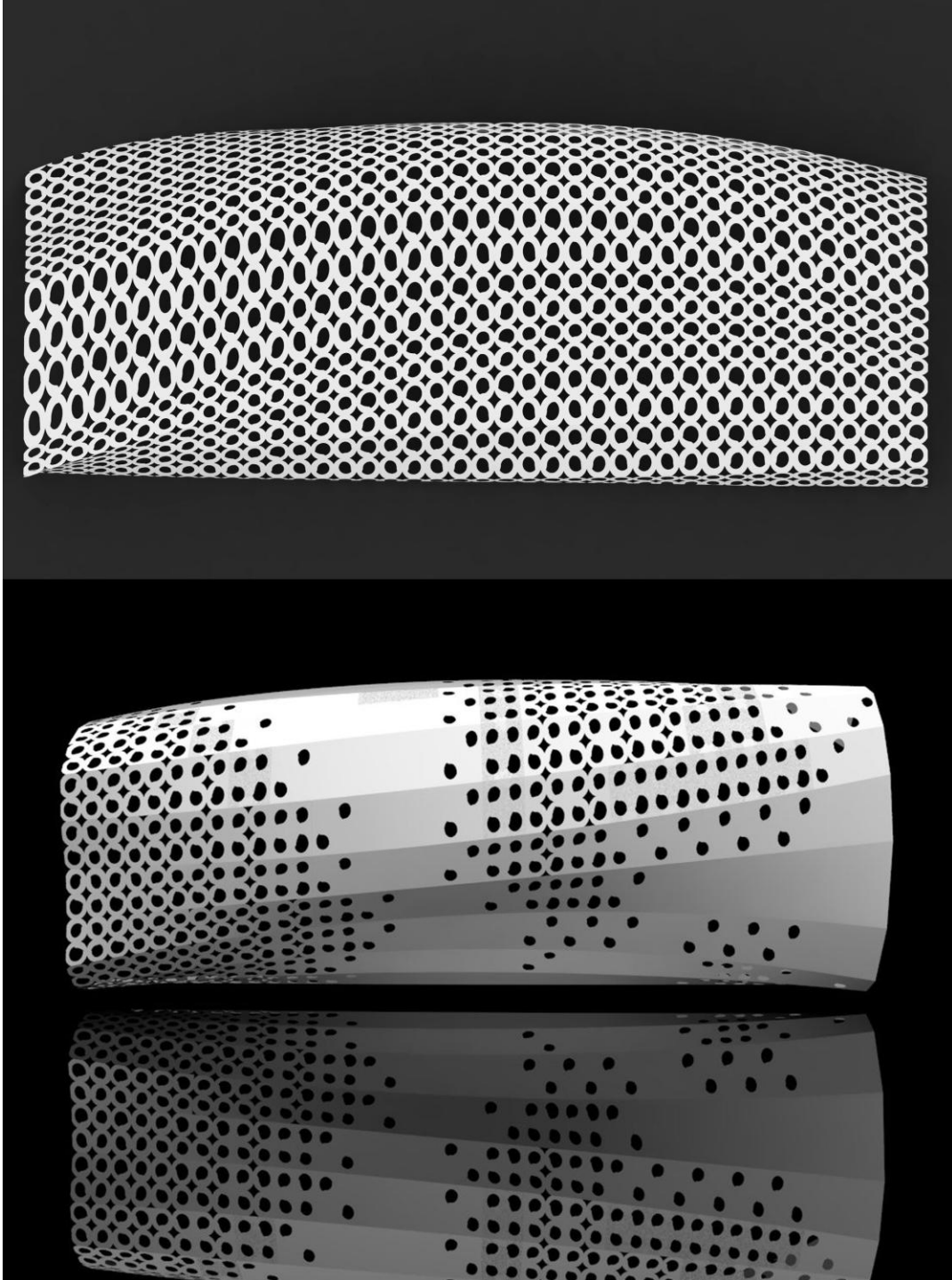


Fig.4 Exercise 2 : Reactive Response

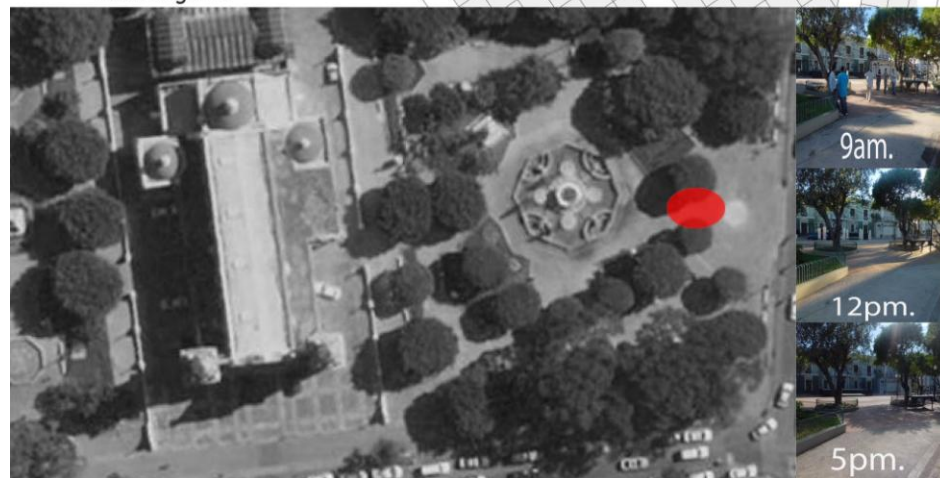
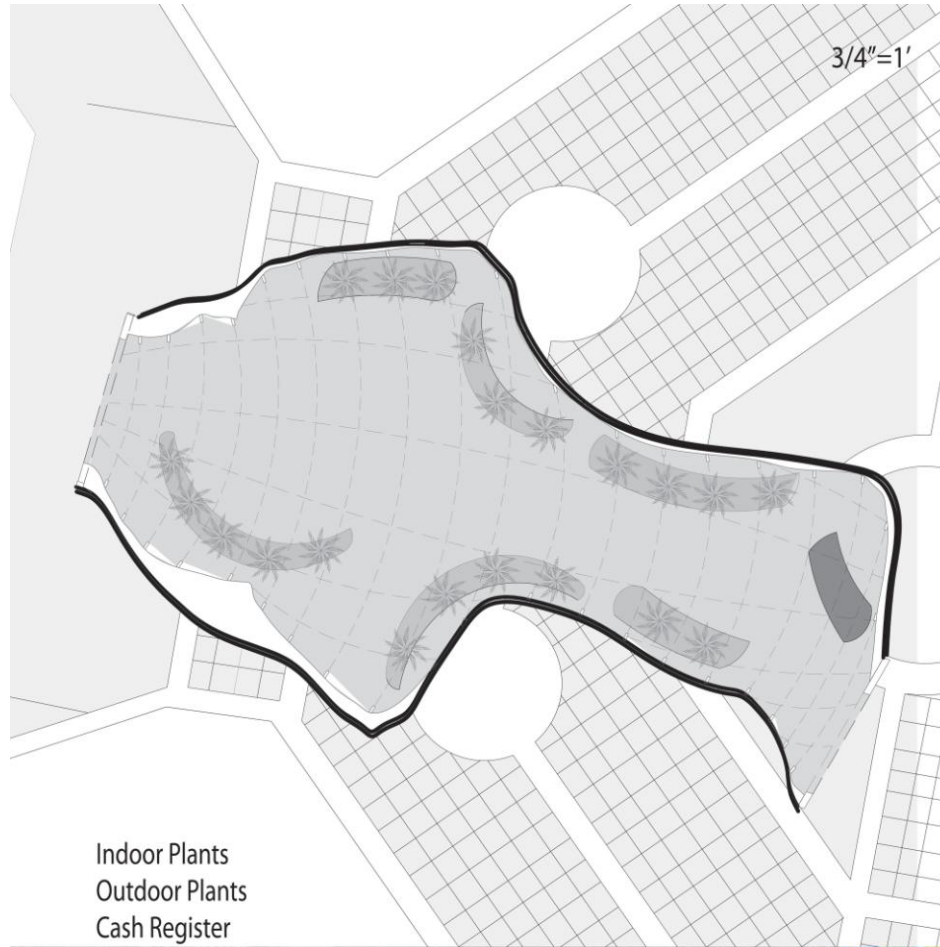


Fig.5 Exercise 3 : Plant Pavillion

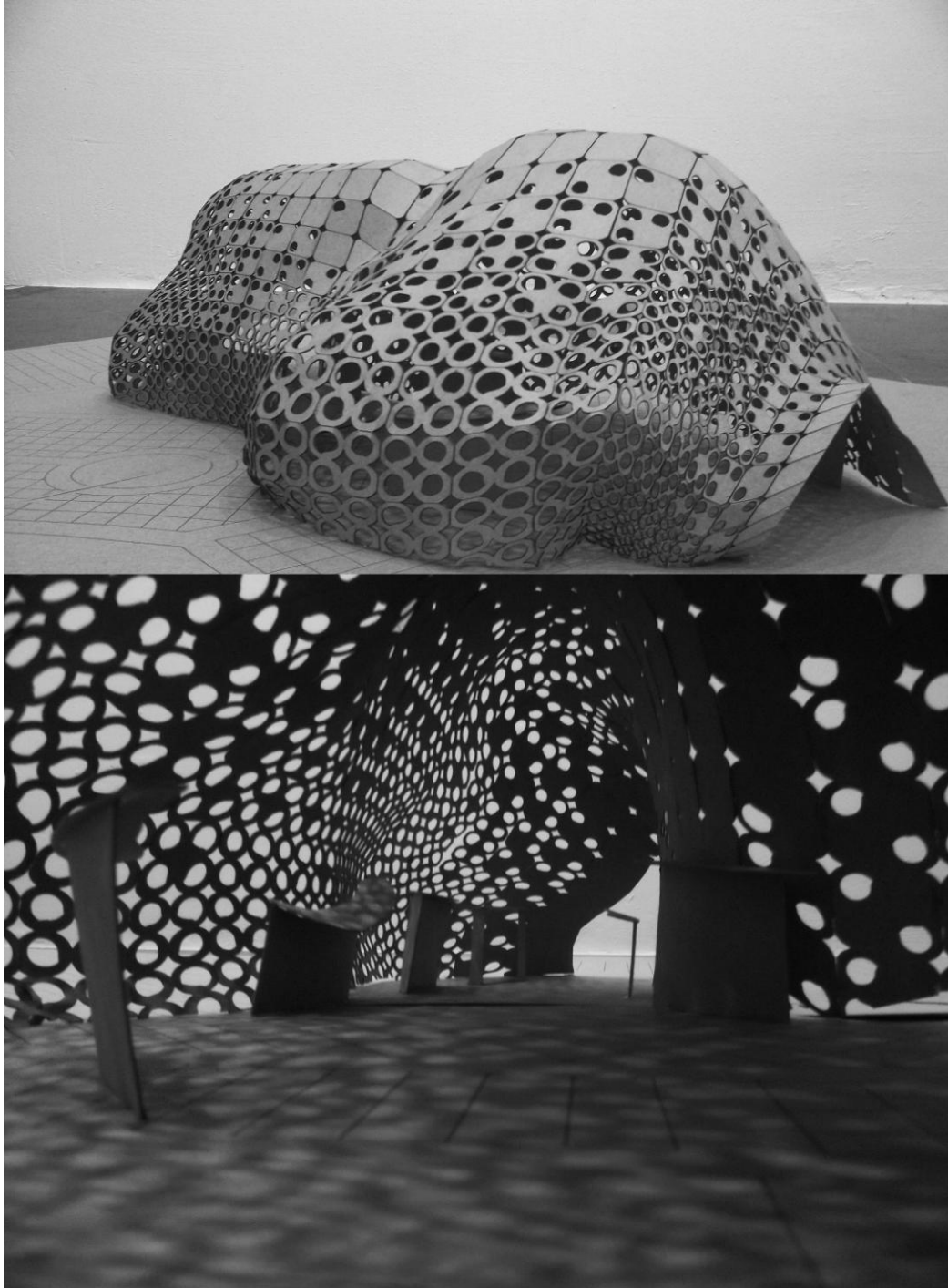


Fig.6 Exercise 3 : Plant Pavillion