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GOLDEN MOON

Hong Kong 2012 Mid-Autumn Festival Lantern Wonderland

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Abstract. The Golden Moon is a temporary architectural structure that explores how Hong Kong's unique building traditions and craftsmanship can be combined with contemporary design techniques in the creation of a highly expressive and captivating popular public event space. It is the 2012 Gold Award winning entry for the Lantern Wonderland design competition organised for the Mid-Autumn Festival and was on display for 6 days in Hong Kong's Victoria Park in the fall of 2012.

Keywords. Traditional craft; procedural modelling; bamboo; pavilion; Hong Kong.

1. Concept

The Mid-Autumn Festival is one of Hong Kong's most significant public holidays and has always drawn major popular attention for being a moment where family reunion is celebrated. The Golden Moon installation was planned as the highlight of this festival. Therefore its design revisits the concept of a Chinese lantern and makes a direct link to the legend of Chang'e, the Moon Goddess of Immortality – two elements strongly associated with the festival. According to the romantic story Chang'e lives on the moon, away from her husband Houyi who lives on earth. The couple can only meet on the night of the Mid-Autumn Festival when the moon is at its fullest and most beautiful. To graphically visualise the passionate love burning between the reunited couple that day, a 6-storey-high spherical lantern, symbolising the moon, is clad with abstracted flames in fiery colours and patterns and animated with a fiery light show. The lantern is placed in a reflection pool and is made large enough for up to 150 people to enter and be fully immersed in the sound and light experience.

2. Materials

For the construction of the Golden Moon traditional materials for making lanterns, such as translucent fabric, metal wire and bamboo, were translated to a large scale. A light-weight steel geodesic dome forms the pavilion's primary structure and is the basis for a computer-generated grid wrapped around it. This grid is materialised through a secondary structure from bamboo. For this, Hong Kong's traditional bamboo scaffolding techniques were used. This highly intuitive and imprecise craft was merged with exact digital design technology to accurately install and bend 2km of bamboo sticks into a grid wrapping the steel dome. This grid was then clad with stretch fabric flames, all lit up by animated LED lights.

3. Geometry & Colouration

The bamboo and flames follow a pattern based on an algorithm for sphere panellisation that produces purity and repetition around the equator and imperfection and approximation at the poles. This gradual change creates a dynamic space that draws a spectator's view up towards the tip. By putting the axis of this cladding grid not vertical but under an angle, the dome gets an asymmetric directionality. This motion is reinforced by the entrance which is placed along this tilted axis to draw people into the sphere where they get swept away along the grid's tangents and vectors. The colouration of the pavilion amplifies this effect: on top of the black painted steel structure eight different saturated colours of stretch fabric are used for the flames. The colours gradually range from ivory and yellow to intense orange, red and deep Bordeaux. The brightest colours are used at the tilted base whereas the darkest colours are used at the pole where they, together with the more scrambled geometry, make the pattern disintegrate into the black night sky.

4. "Building Simplexity"

The Golden Moon strategically combines digital design & fabrication techniques with traditional crafts and basic materials. Procedural modelling techniques were used to control the geometry: a sphere is wrapped with a diagrid according to a Fibonacci sequence that produces order along the equator and randomness at the poles. Code was used for the production of simple drawings that would allow the labour force to mark up intersections between the steel structure and bamboo easily. These drawings took traditional bamboo scaffolding construction detailing into consideration in the definition of installation tolerances (of around 10cm). Optimisation scripts were finally used to reduce the amount of unique stretch-fabric flames from 470 different units to 10 different types which could stretch and

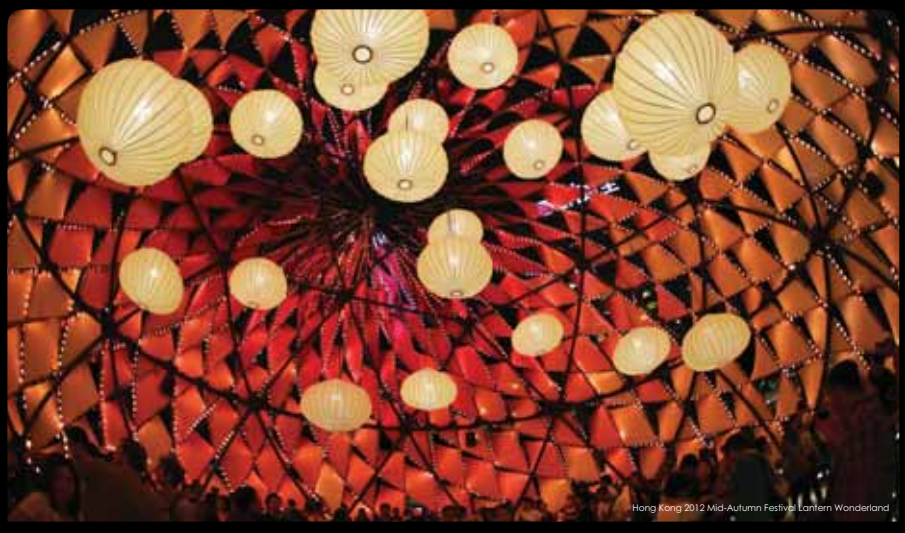
adapt to their various conditions. All details and construction procedures were devised to allow for a high-speed production as only 11 days of onsite construction were available for this 6-storey-high pavilion. A very close conversation with the craftsmen was required from the beginning: preconceptions of building methods and familiar construction techniques had to be abandoned by all parties as both the digital and the material world demanded a new design and building set-up to be devised.

5. Conclusion

The Golden Moon was built in only 11 days and shows how complex geometry can be built at high speed and low cost with the simplest of means. It rethinks the premise of digital design by anchoring the paradigm in a strong materiality. With over 400,000 visitors during its 6-day lifespan, the pavilion design aimed for its dynamic space, structure, colour, texture and light to trigger a sensuous response from visitors of the 2012 Mid-Autumn Festival.

Acknowledgements

Competition Design | Kristof Crolla & Adam Fingrut of LEAD
Project Management | Laboratory for Explorative Architecture & Design Ltd.(LEAD), G/F 1 Tai On Terrace, Sheung Wan, Hong Kong S.A.R., www.l-e-a-d.pro
Project Management Team | Kristof Crolla, Sebastien Delagrange, Dannes Kok, Kenneth Cheung and Yi Sa Chan of LEAD, and Nicholas Benner, Chris Lee (Anthropods Associates Ltd.), Paulina Lau (APT Engineering Consultant Ltd.)
Construction | Free Form Construction Co. Ltd. (Main Contractor), Fonkwang Development Ltd. & Guangzhou Shipyard Company Ltd. (Steel), Wing Yick Scaffolders (Bamboo), Wings Design Production Ltd. (Fabric), LED Artist (LED)
Light & Sound Design | LED Artist
Photography | Kevin Ng, Grandy Lui and Pano Kalogeropoulos



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