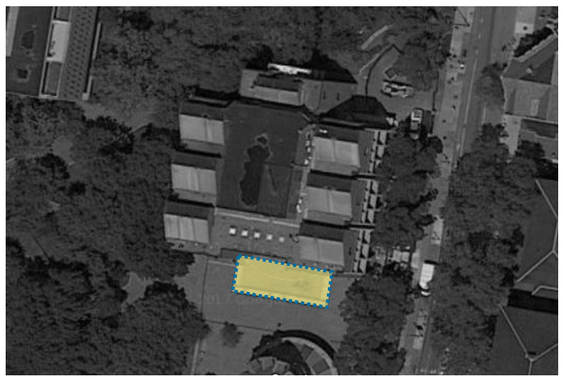
SHADING DESIGN

WESTON HUANG

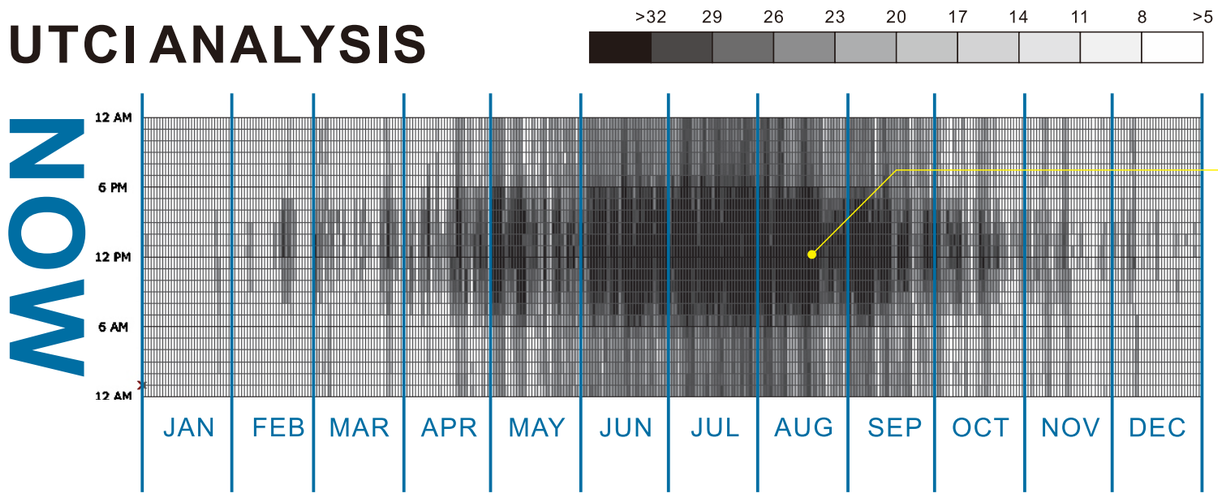
ABOUT THE SITE

The site is located at the front plaza of Penn Design, University of Pennsylvania, Philadelphia, Pennsylvania, United States. It is between the Meyerson Hall and Fisher Art Library.

Nowadays, this plaza is a main outdoor place for activities. However, without any shading devices, it would be uncomfortable for human in this place due to the exposure of sun radiation. Therefore, adding a shading device here may be a strategy of improving the thermal quality.



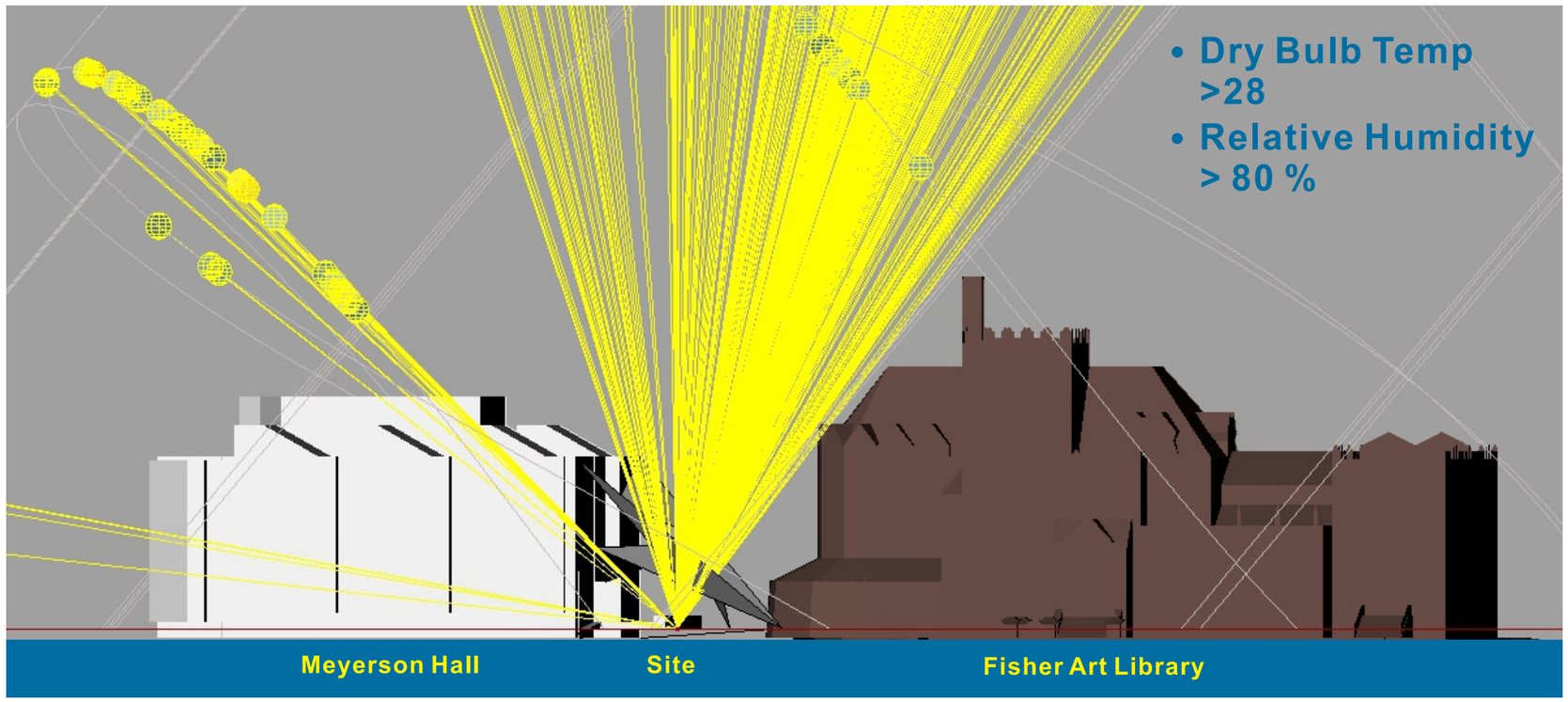
UTCI ANALYSIS



- **Target UTCI**

The black color indicates that the UTCI is higher than 29 Celsius, which has the potential heat stress for people. So, the shading should help reducing the thermal discomfort when the UTCI is higher than the target value.

SUN PATH UNDER SPECIAL CONDITIONS



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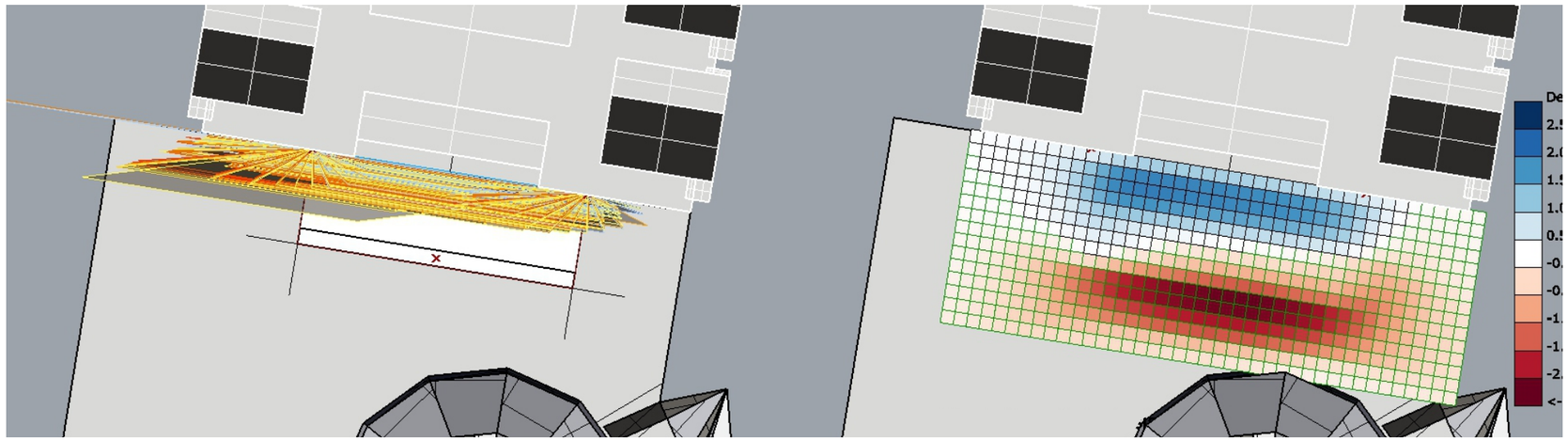
Design Strategies

In order to understand the direction of sun radiation, the sun vector is applied to the analysis. But there were tremendous data in a year, some pointed out the radiation with over-heated temperature, while others were not so harmful. As a result, the special conditions were introduced in the analysis:

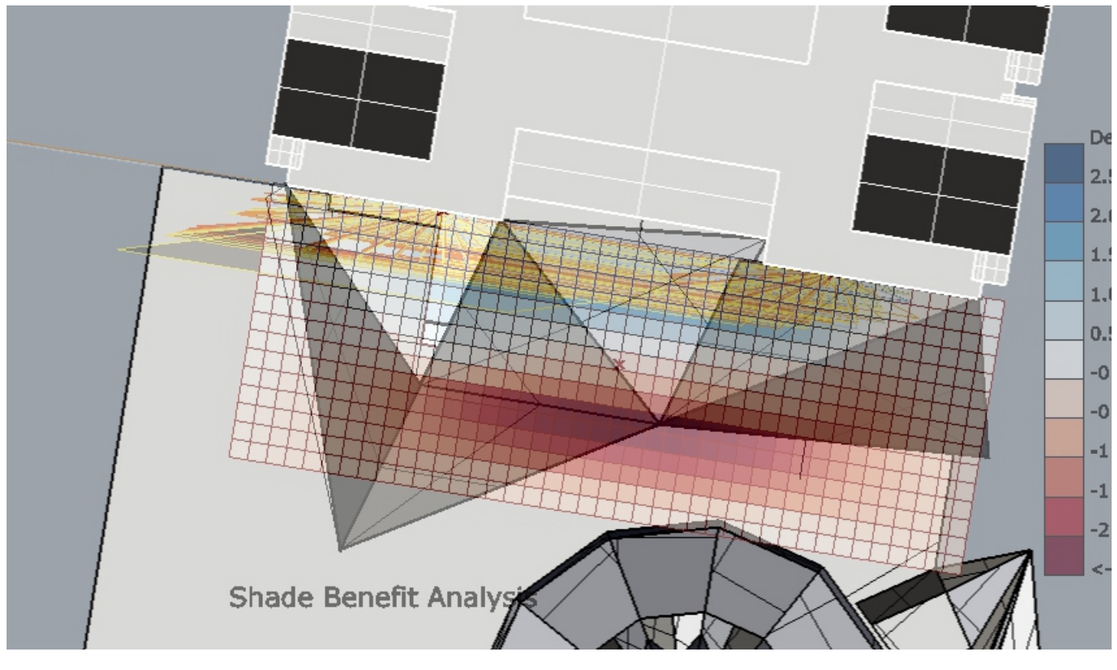
Only include the time when the dry bulb temperature is higher than 28 Celsius, and the relatively humidity is higher than 80 percent.

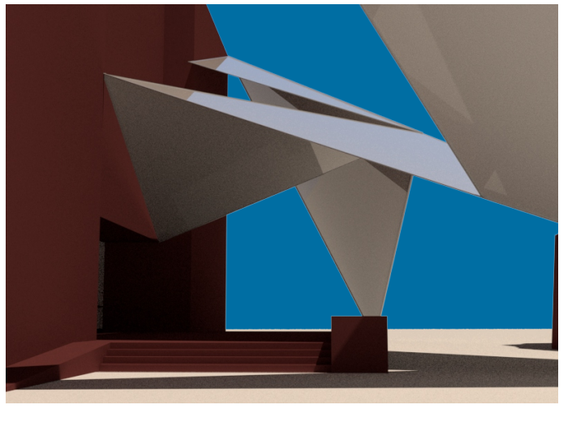
ANALYSIS VIA LADYBUG



- **Shading Designer**
- **Outdoor Comfort Shade Benefit**

DESIGN LAYOUT





˙Shade the heat

The shading device will block the heat from the solar radiation which is mainly from the southern west. Moreover, it almost shades the recommended shading area that “Outdoor Comfort Shade Benefit” simulated.