

# DAYLIGHTING DRIVEN DESIGN: OPTIMIZING KALEIDOCYCLE FACADE FOR HOT ARID CLIMATE

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## **Abstract**

Facade design has significant impact on daylight. This paper presents a facade based on origami: kaleidocycle rings that can be morphed enhancing daylight performance in residential spaces, which complies with both LEED V4 and Daylight availability. Daylighting analysis was integrated using Grasshopper, Diva and Genetic optimization for a south-oriented living room facade in Cairo, Egypt, through two phases. First phase dealt with base cases of specific typology. Second phase was conducted using parametric optimization process. Results demonstrate that Kaleidocycle rings of 30 cm size and 64 rotation's angle reached results that exceed LEED v4 requirements while passing Daylight availability standards.

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