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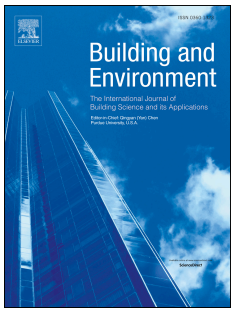

A human-centric approach to assess daylight in buildings for non-visual health potential, visual interest and gaze behavior

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A human-centric approach to assess daylight in buildings for non-visual health potential, visual interest and gaze behavior

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Highlights:

- This paper introduces a novel approach to daylight assessment based on predictive models concerning non-visual health potential, visual interest, and gaze behavior within a visually immersive scene.
- Three predictive models are applied from 18 initial view directions over a 360° span for different time instances to provide a temporal and spatial analysis of an architectural case study from a central view position.
- These models were developed to quantify daylight performance based on physiological, perceptual, and behavioral human data brought together for the first time to illustrate the need for multi-criteria analysis and human-centric performance assessment of daylight.
- Daylight performance from a human-centric perspective can provide designers with more information on an occupant's health, interest, and comfort, to move beyond analyses reliant on task-oriented illumination to address specific human needs of ocular light exposure.

Abstract

This paper introduces a novel approach for the assessment of daylight performance in buildings, venturing beyond existing methods that evaluate 2-dimensional illumination and comfort within a fixed field-of-view in order to predict human responses to light concerning non-visual health potential, visual interest, and gaze behavior in a visually immersive scene. Using a 3D rendered indoor environment to exemplify this coordinated approach, the authors assess an architectural space across a