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Extending the lighting design objectives procedure for holistic lighting solutions

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Comment

Appendix

Comment 1:

Kevin Mansfield (Institute for Environmental Design and Engineering, UCL, London, UK) The LiDOs procedure seems to belong to a tradition of specifying how the boundary surfaces of an architectural space are to be lit and the revealment, by lighting, of objects and people that occupy that space. This tradition runs from Waldram's gross and detail apparent brightness pattern through to the IES Multiple Criterion design approach of the 1970s and on to Lynes' procedure for designing lighting in terms of relative surface illuminances. A stage lighting designer uses a similar approach in setting the background ambience of a stage set and using key lights to 'reveal' the characters on stage. In the digital realm, a video game designer sets the lit 'ambience' of the virtual world and then reveals objects and characters as you move through the inhabited spaces.

The author places spatial brightness at the centre of the discussion defined as an "attribute of visual perception...according to which a luminous environment...appears to contain more or less light". We might ask which characteristics of the space contribute to 'how brightly lit' or 'how dimly lit' a space appears to be? Whittle¹ contends that "The visual system responds to luminance differences, attenuates them by a function of adaptation level and extrapolates brightness across the region between edges". Lynes² agrees that as an observer looks around a lit space, "his adaptation level changes continually and at a speed comparable with the time taken to fixate". Aldworth³ concurs yet points out that "from practical experience we know that moving around most interiors does not dramatically change the visual impression of the room". The author has proposed that 'how brightly' or 'how dimly' lit a space appears—its 'ambient illuminance'—is specified in terms of mean room surface exitance (MRSE). This is a mean, an average, and a measure of flux density (lumens per square metre) linked to psychological descriptors such as 'very brightly lit' and 'dimly lit' as shown in Table 1 of the paper. It would be interesting to hear which characteristics of the visual field, described by MRSE, are creating the physiological, psychological response to the lit space? Is an appropriate analogy that the observer is responding to the diffuse light from the inside of a very large integrating sphere of uniform reflectance? Can this metric fully characterise psychological responses to a lit space with surfaces of varying reflectance and with perhaps self-luminous luminaire elements and views of the sky through fenestration?

The second stage of LiDOs identifies target surfaces or objects to receive direct illumination. The author has compellingly deconstructed the lighting patterns produced when a three-dimensional object intercepts a light field—shading, highlight and sharpness. But what is not often mentioned, and which I believe was in the author's original paper, is that an indicator

of 'good' lighting is that which reveals at the same time the 'glossiness' of the apple, the matt surface of the peach and the 'faceted' nature of the pineapple (Figures 7(a) and (b)). What would be the most suitable metric to use in this case when designing the targeted effects of light?

Finally the author provides in this paper a rich library of lighting design objectives, nine assigned to 'ambient' lighting design and five to the 'targeted' effects of light. Is it a step too far to try and incorporate all or many of these objectives into a universal prescription for lighting design? Or would it be better, depending on the scenario, to check the objective by a separate procedure on a case-by-case basis as suggested by the author with respect to Discomfort Glare?

References

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