Evaluating the Subjective Degrees of Discomfort Glare

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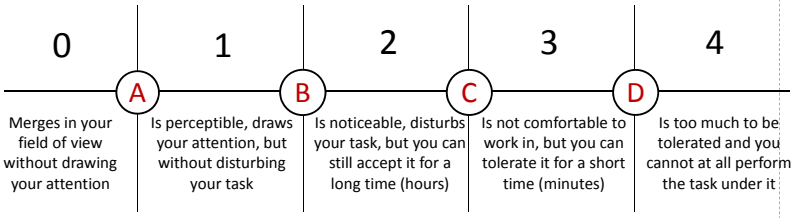
Introduction

Existing subjective degrees of discomfort glare formulae were established by adjusting glare source to predefined criteria reported only in an ascending order (i.e., lowest to highest levels of visual discomfort). [1] This can be an experimental bias.

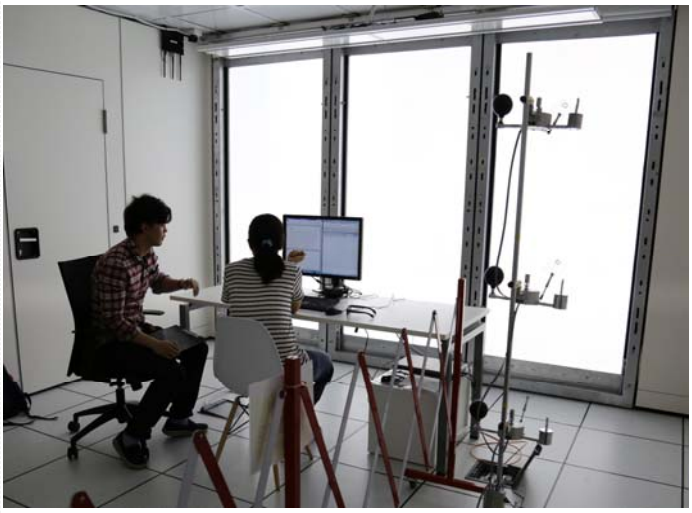
This study investigates the differences in calculated glare index values when using adjustments with ascending, descending and randomized sequences to each criteria.

BEARS Glare Scale

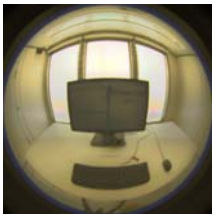
New glare rating scale (BEARS glare scale) has been developed for the experiment:

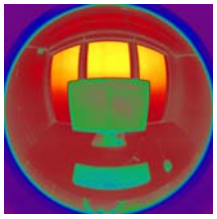


Methodology



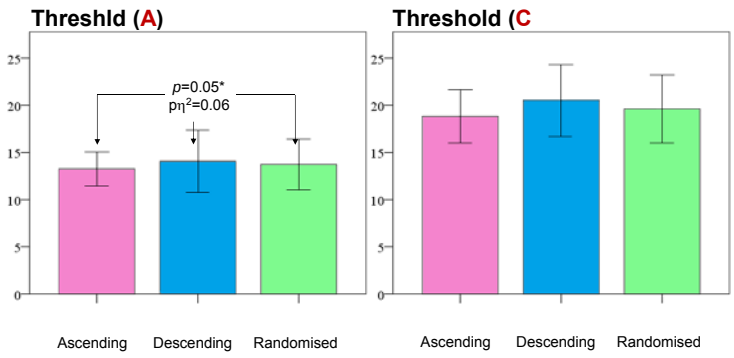
- Adjustments were made to the window brightness of the daylight emulator in SinBerBEST testbed
- Subjects 'vocally' indicated when each threshold corresponding to 'A', 'B', 'C' and 'D' on the BEARS glare scale were reached
- Procedure was repeated using ascending (A>B>C>D), descending (D>C>B>A) and random (e.g. B>D>A>C) sequences
- During procedure, subjects focused on pseudo-text typing task


HDRI photograph


False colour luminance map


Evalglare image

Preliminary Findings



Summary

Statistical and substantive effect of sequence bias have been detected

Results questions alleged precision of existing glare index formulae that are based on Petherbridge and Hopkinson's glare constant equation

New glare index could be developed by using the experimental results

[1]Petherbridge P and Hopkinson RG. Discomfort Glare and the Lighting of Buildings. *Transactions of the Illuminating Engineering Society*, 1950; 15(2): 39-79.

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