

TECHNICAL NOTE

Example Luminance Measurement Setup for UGR

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EXAMPLE LUMINANCE MEASUREMENT SETUP FOR UGR

Summary

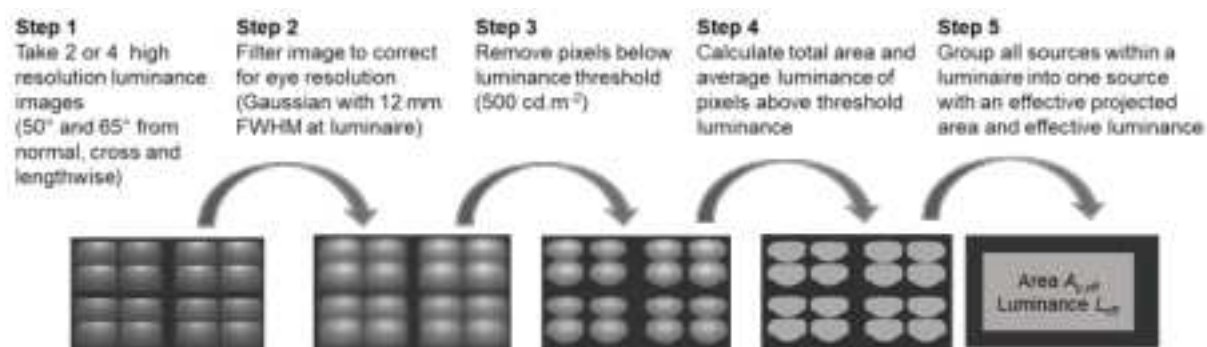
Technical Report CIE 232:2019 specifies a supplement to the Unified Glare Rating (UGR) method to determine the glare source area in case the glare source has a non-uniform luminance. The method requires high dynamic range (HDR) luminance images of the glare source. In this Technical Note, an HDR luminance image measurement setup is described that can be used to generate images according to CIE 232:2019 specifications. Two examples of such measurements are given, including the image analysis and the determination of the glare source dimensions. Although some guidance is given, this Technical Note is not intended to be a detailed measurement guide and should be used in conjunction with other CIE publications.

1 Introduction

Technical Report CIE 232:2019 “Discomfort caused by glare from sources with a non-uniform source luminance” describes a measurement method to determine the glare source area to be used in the calculation of the Unified Glare Rating (UGR) (CIE 2019). The measurement involves high dynamic range (HDR) luminance imaging of the glare source using an imaging luminance measurement device (ILMD), also referred to as a luminance camera, at a few specified measurement angles and with a specified image resolution. While the report clearly describes the luminance image specifications, it does not describe how such images can be measured.

NOTE: Rigorously speaking, an “image” is a representation of the set of measurements which is used for visual analysis; however, in this document the term “image” is also used to describe the set of measurements.

Figure 1 summarizes the image measurement and analysis method according to CIE 232:2019.



NOTE The FWHM is the full width at half maximum of a distribution function.

Figure 1 – Overview of the measurement and image processing steps that are required to obtain the effective projected area and effective luminance (Figure 2 of CIE 232:2019)

The result is an effective luminance, L_{eff} , and an effective projected area, $A_{\text{p,eff}}$, of the non-uniform glare source. These quantities can then either be used to compute a correction to UGR or to redefine the projected area such that no correction is needed. In the latter case, this new projected area $A_{\text{p,new}}$ is

$$A_{\text{p,new}} = \frac{I^2}{L_{\text{eff}}^2 A_{\text{p,eff}}} \quad (1)$$