Pedagogical Teaching Aids

Sem: VII **Subject:Digital Image Processing** **Subject code: 18EC733**

Model Title: Basic experimental setup used to characterize brightness discrimination

This model has been used as a teaching aid to teach VII sem students for the subject Digital Image Processing (18EC733) for the topic Basic experimental setup used to characterize brightness discrimination from the module-1 Digital Image Fundamentals

Description: The ability of the eye to discriminate between changes in light intensity at any specific adaptation level is also of considerable interest. A classic experi-ment used to determine the capability of the human visual system for bright-ness discrimination consists of having a subject look at a flat, uniformly illuminated area large enough to occupy the entire field of view.This area typically is a diffuser. that is illuminated from behind by a light source whose intensity, I, can be varied. To this field is added an increment of illumination, ΔI. in the form of a short-duration flash that appears as a circle in the center of the uniformly illuminated field, as shown in below model. If ΔI is not bright enough, the subject says "no," indicating no perceivable change. As ΔI gets stronger. the subject may give a positive response of "yes," in-dicating a perceived change. Finally, when ΔI is strong enough, the subject will give a response of "yes" all the time. The quantity $\Delta I_C/I$. where ΔI_C, is the increment of illumination discriminable 50% of the time with background illumination I, is called the Weber ratio. A small value of $\Delta I_C/I$ means that a small percentage change in intensity is discriminable. This represents "good" brightness discrimi-nation. Conversely, a large value of $\Delta I_C/I$ means that a large percentage change in intensity is required. This represents "poor" brightness discrimination.

Outcome: This model will help students to understand the experimental setup used to characterize brightness discrimination.

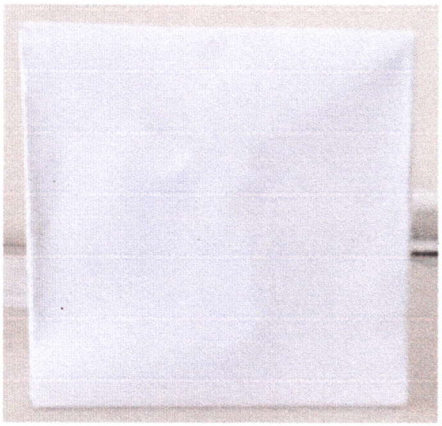

Fig. 1. Illuminated from behind by a light source whose intensity, I

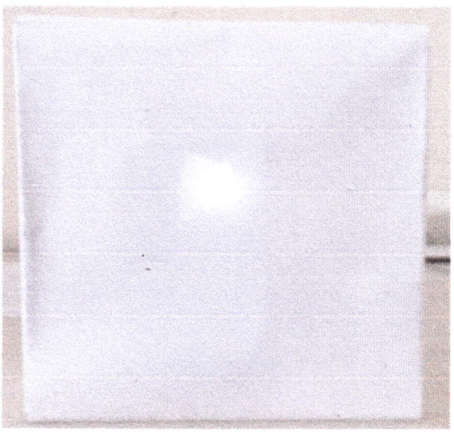

Fig. 2. Illuminated from behind by a light source whose intensity, $I + \Delta I_C$

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