

Perceptual Impact of Peak Luminance and Contrast in Direct View HDR Display

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Paper + Data + Code

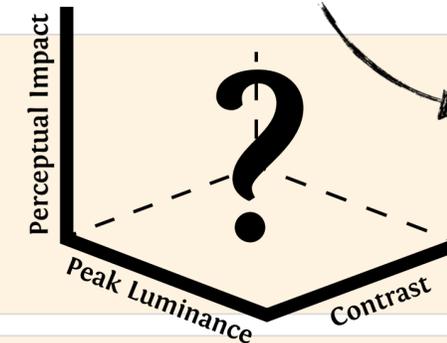


Problem

Given a display's contrast and peak luminance, how do we know if it qualifies as HDR?

Industry standard and prior user studies exist...

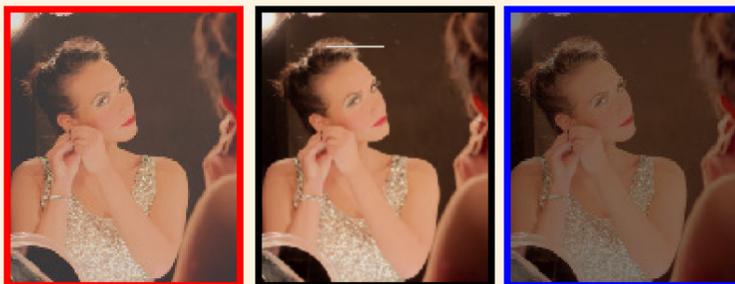
But they either do not provide perceptual rationale or only study a limited set of conditions.



User Study

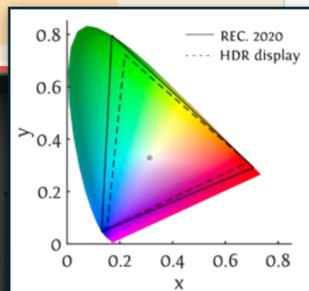
Which video, **A** or **B**, is closer to the reference, in terms of both contrast and brightness?

Video A Reference Video B



Hardware

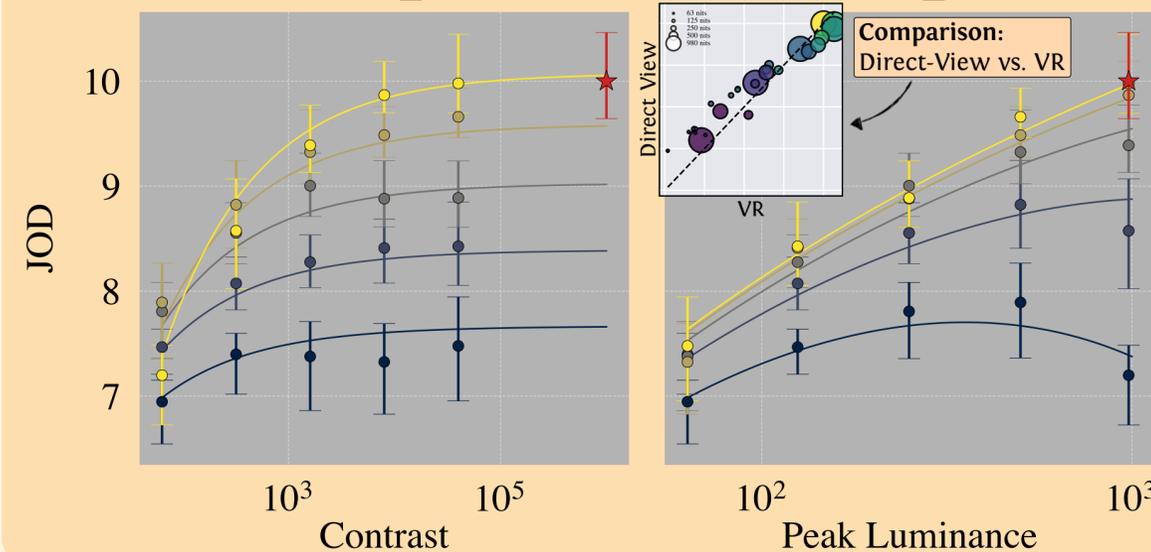
EIZO HDR display:
 1,000 nits peak luminance
 1,000,000:1 contrast



REC.2020
 PQ EOTF

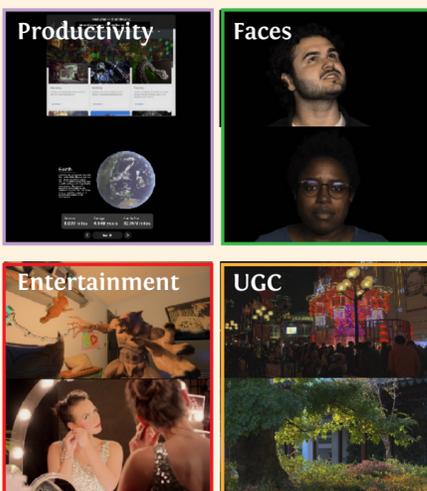
Results

63 nits, 125 nits, 250 nits, 500 nits, 1,000 nits, Reference, 64:1, 320:1, 1,600:1, 8,000:1, 40,000:1, Reference



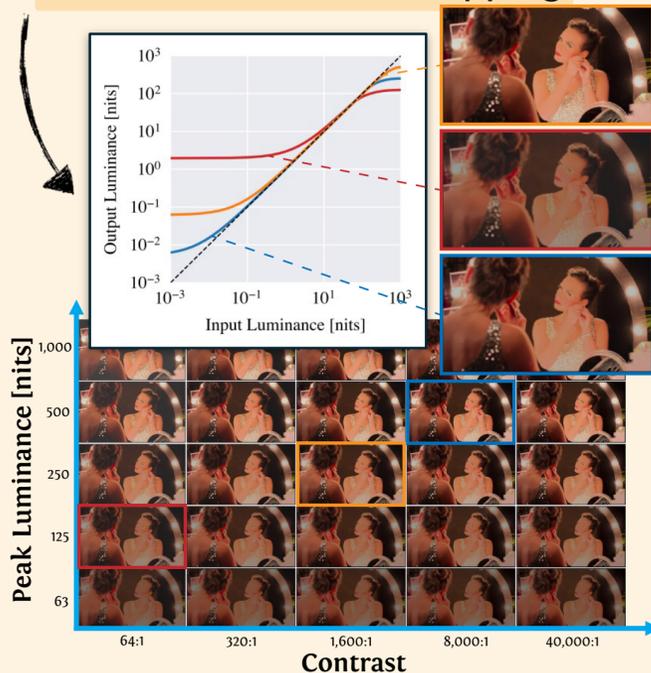
Stimuli

8 scenes
 5 contrasts
 5 peak luminosities
 = 200 total trials



Display Simulation

Simulation via tone mapping



Application

