

Perceptual Impact of Luminance and Contrast in Immersive Displays

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Problem

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

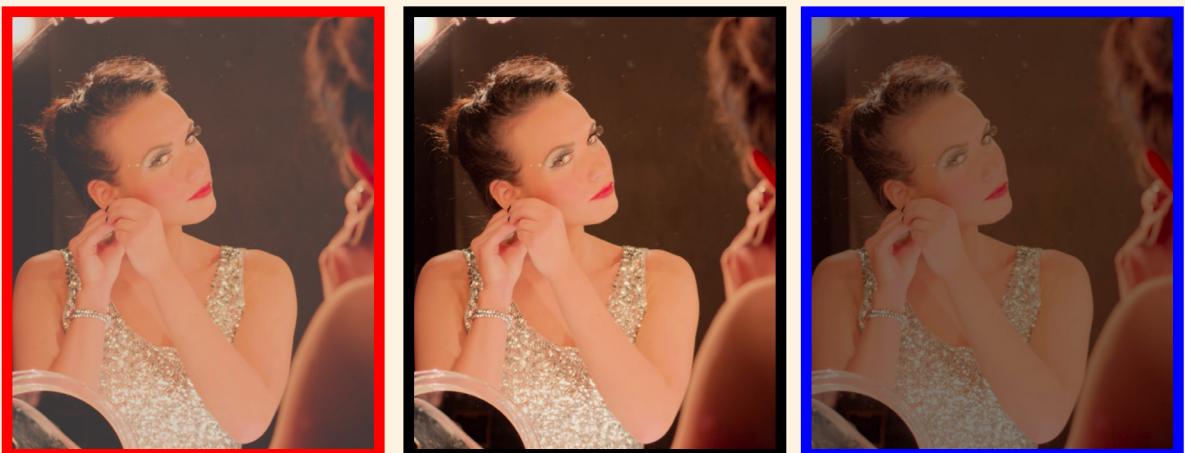
Industry standard and prior user studies exist...

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**



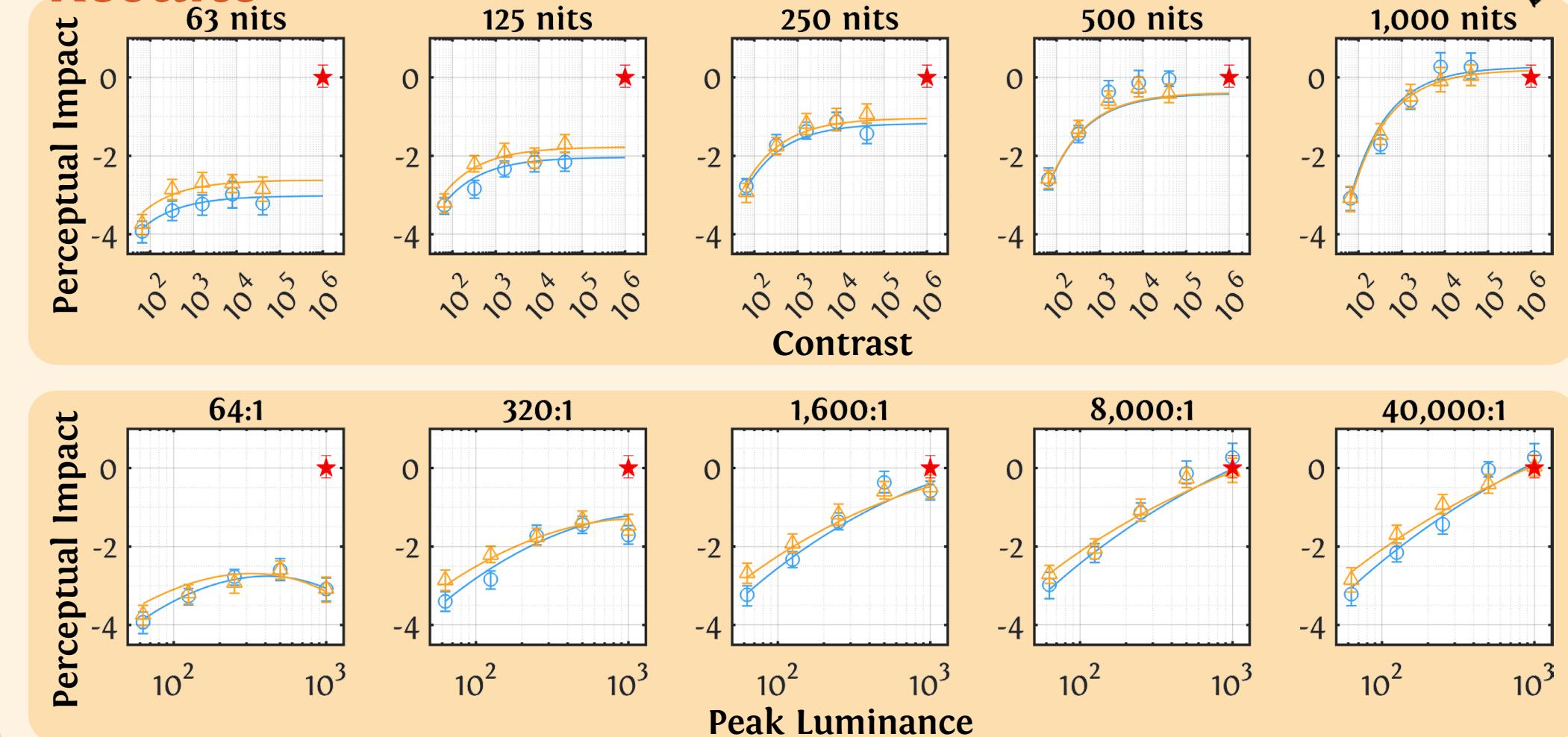
Hardware

HDR haploscope:
1,000 nits peak luminance
1,000,000:1 contrast

HDR Displays

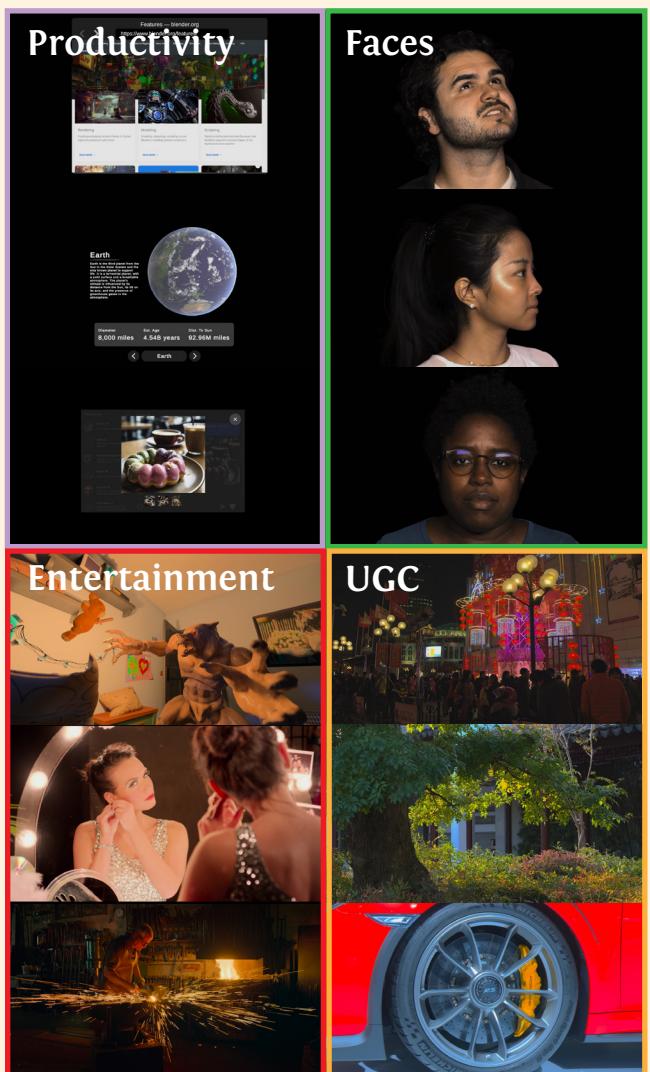


Results



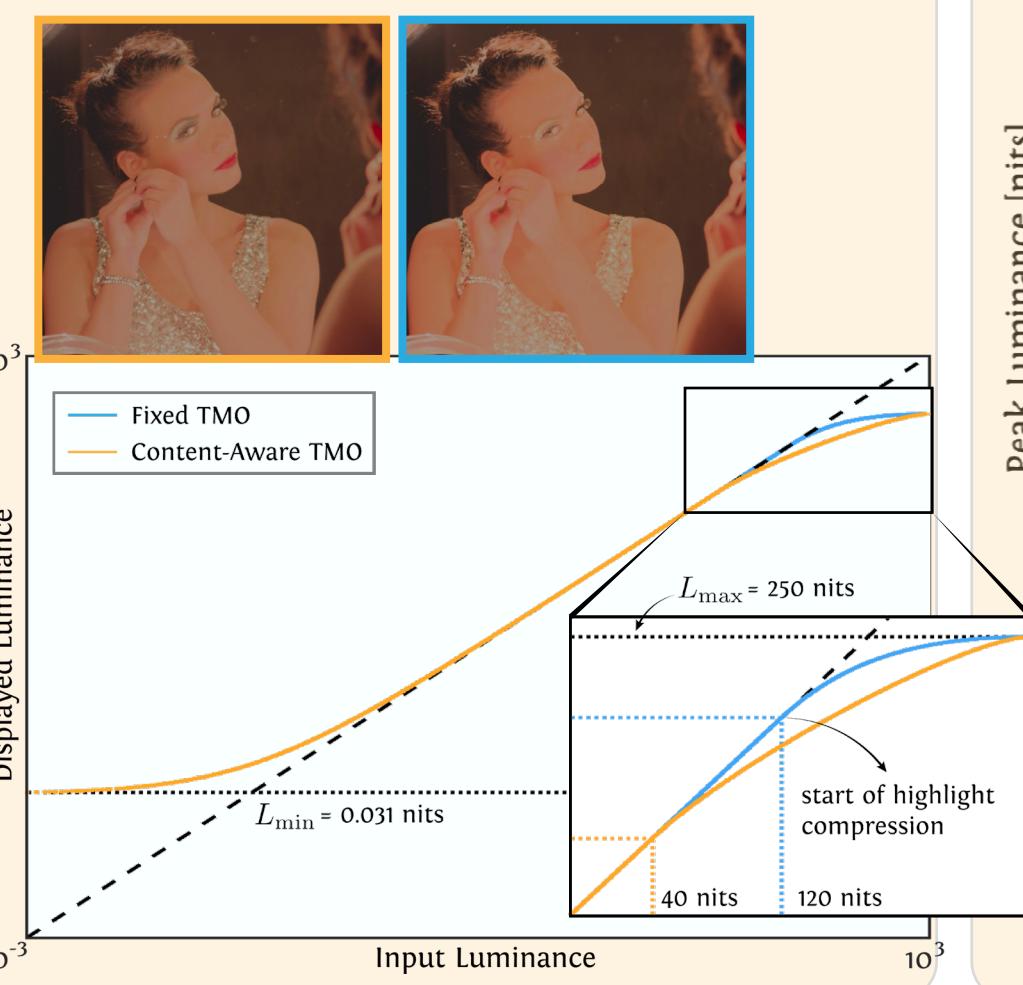
Stimuli

12 scenes
5 contrasts
5 peak luminances
2 tone mappers

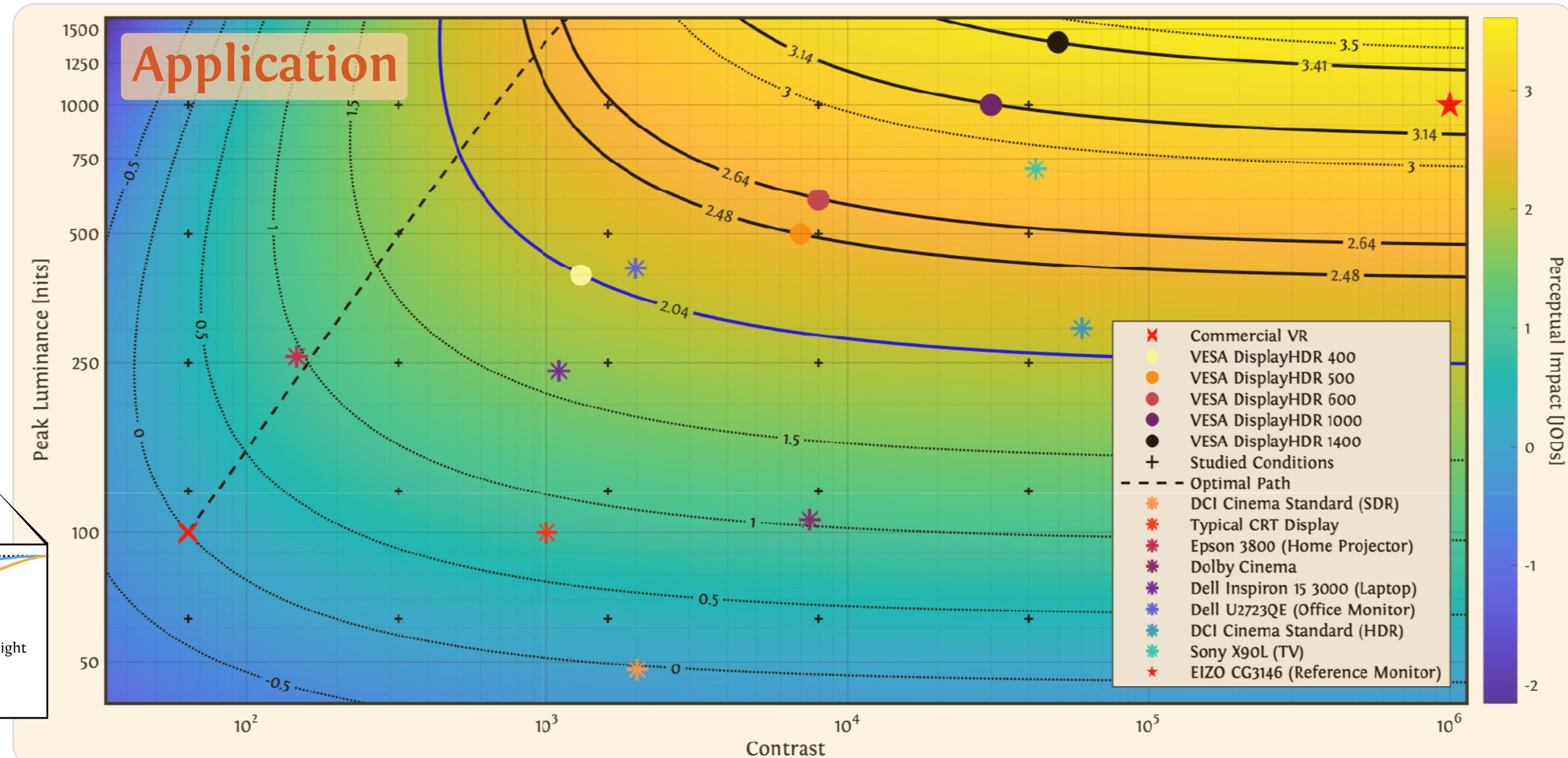


Display Simulation

Display parameters are simulated via tone mapping.



Application



Paper + Data + Code

