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The background is a dark, abstract composition of blue and green bokeh lights. The lights are out of focus, creating a soft, ethereal glow. The colors range from deep navy blue to a vibrant, slightly greenish-blue. The overall effect is reminiscent of a starry night sky or a microscopic view of light particles.

STEREO COMFORT

Viewing Comfort in 3D is dependent on two factors:

- Ocular and Oculo-motor health
- Stereoscopic Reproduction

Stereo Reproduction Factors - Viewing Comfort

- Stereo Symmetry
- Vergence
- 2D Vs 3D



STEREO SYMMETRY

Stereo Symmetry

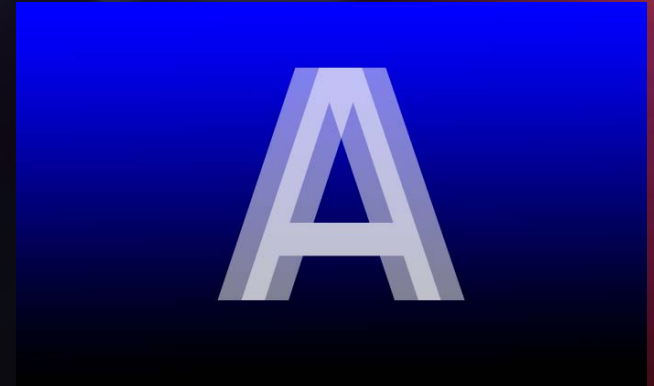


Complementary pair (Symmetry)

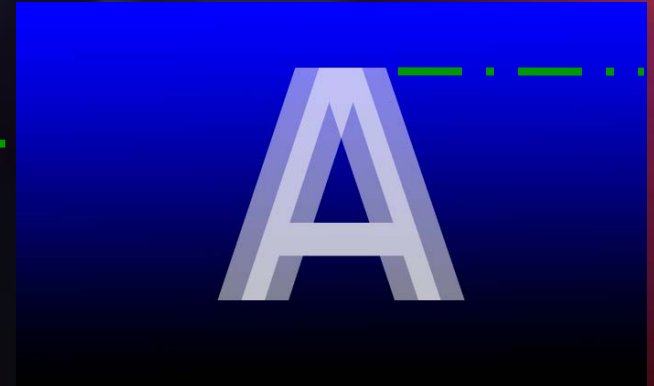


Mismatched pair (Asymmetry)

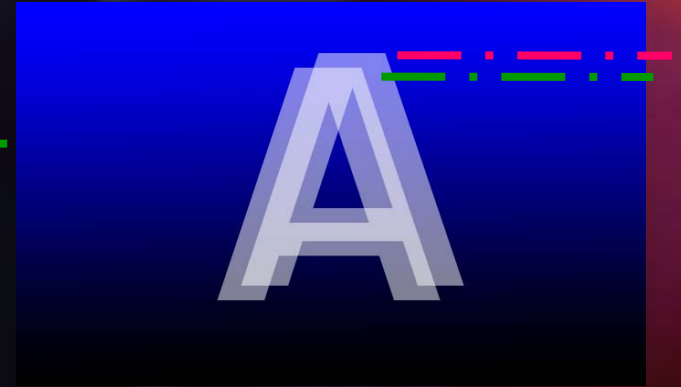
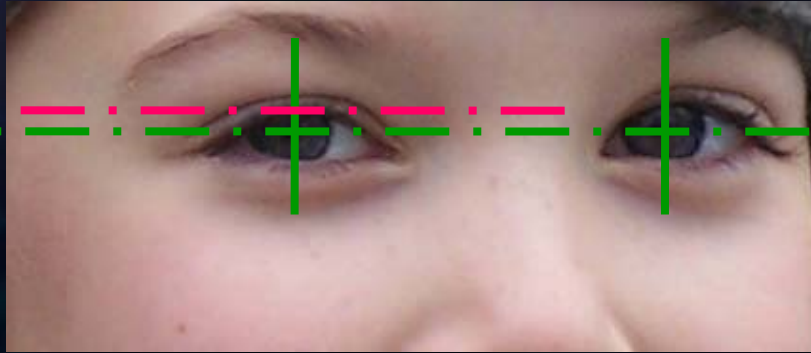
Stereo Symmetry



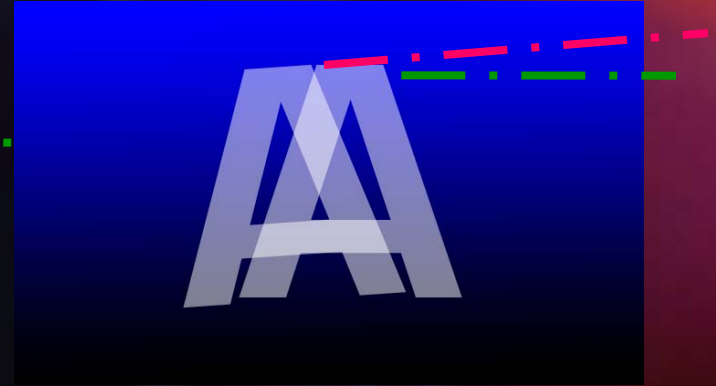
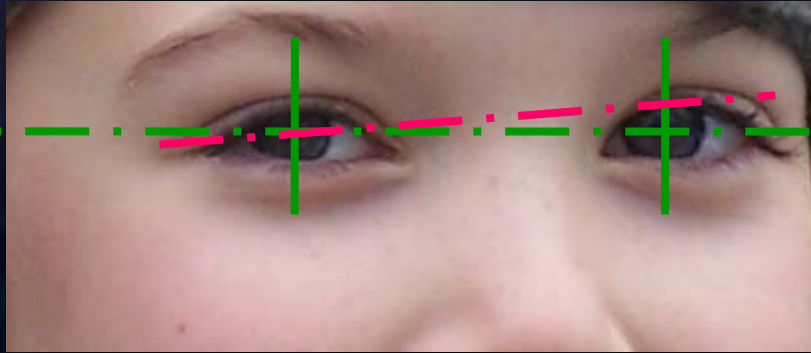
Stereo Symmetry



Stereo Symmetry



Stereo Symmetry



Stereo Symmetry - Some Examples



Alignment / Scale / Rotation



Depth Of Field

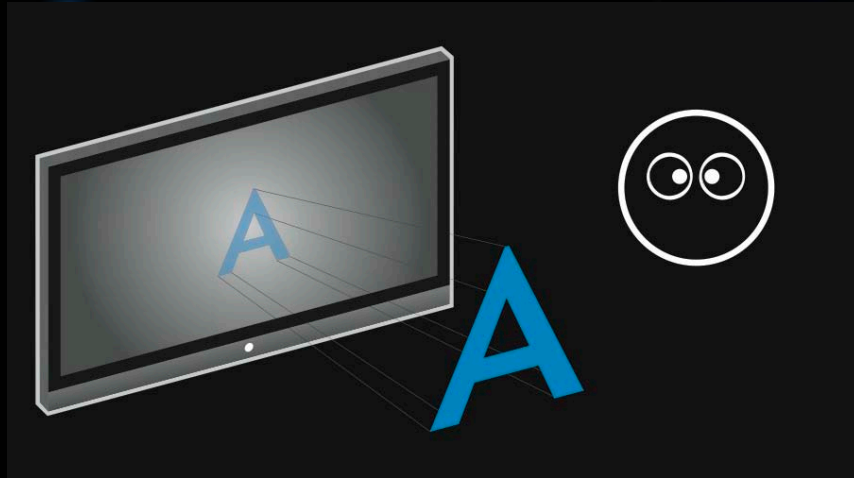


Color / Luma

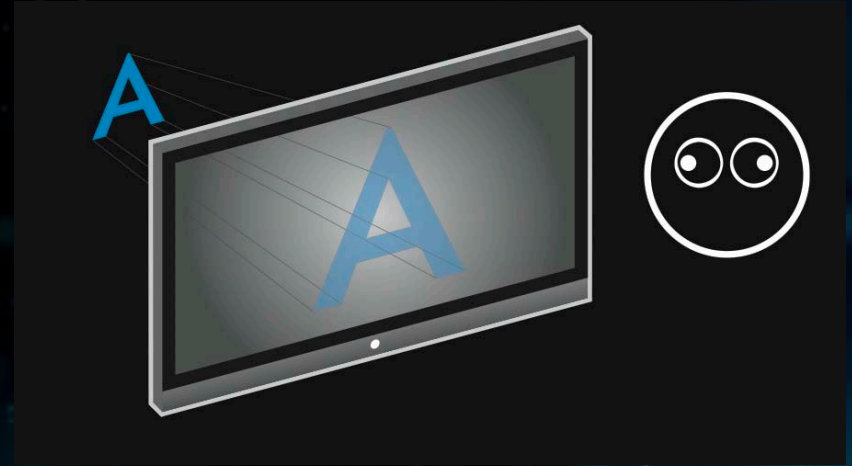
- Flares
- Contamination
- Sync / Genlock
- Visual Mismatch

VERGENCE

Vergence



Hyper Convergence



Hyper Divergence

Vergence Varies By Venue

2K Cinema

Hyper Convergence: Beyond -15px

Hyper Divergence: Beyond +30px

Depth Budget: 45px overall

HDTV

Hyper Convergence: Beyond -40px

Hyper Divergence: Beyond +60px

Depth Budget: 100px overall

2D Vs 3D

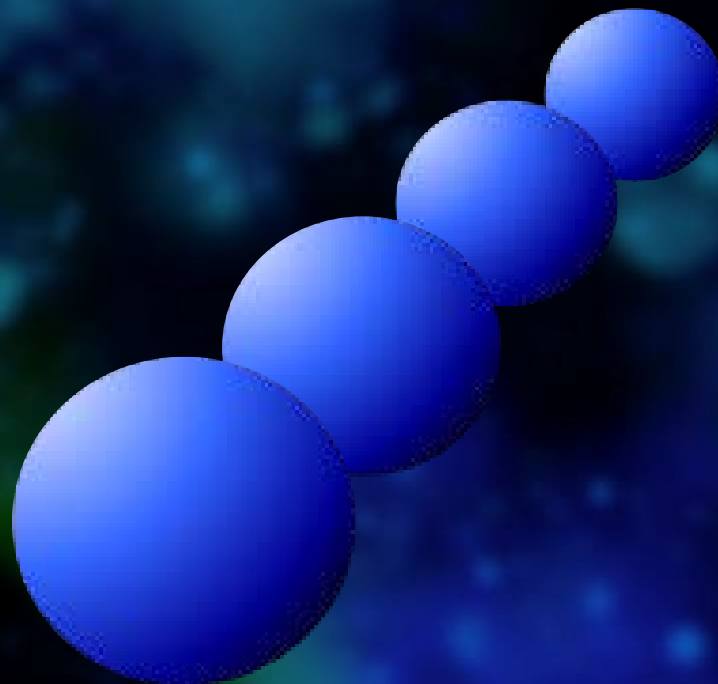
2D Vs 3D



Monocular (2D) Vision
 \neq
Stereoscopic (3D) Vision

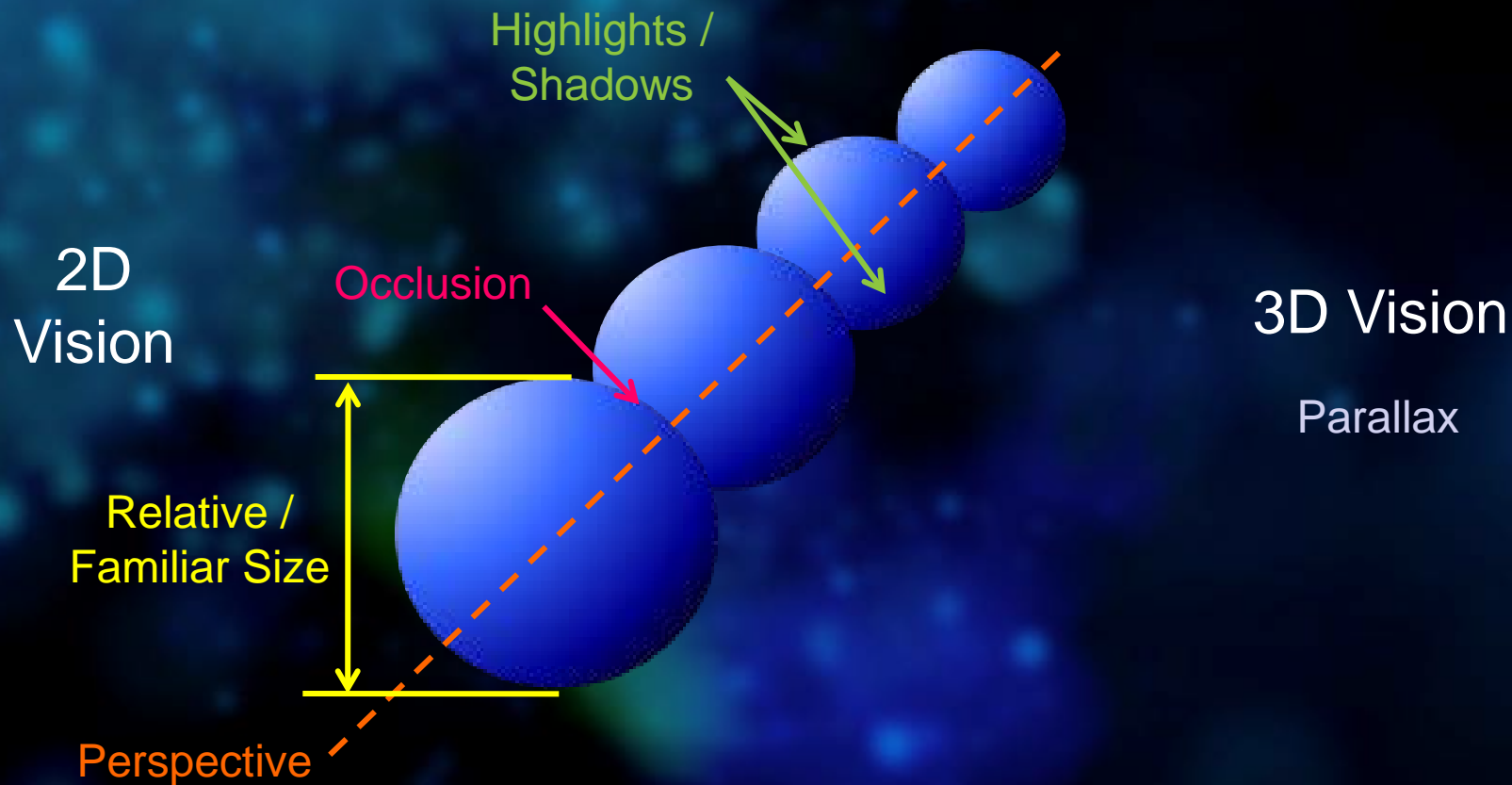
2D Vs 3D

2D
Vision



3D Vision

2D Vs 3D



2D Vs 3D - Usual Suspects

- Subtitles and Captions
- Graphics
- Visual Effects
- Bad 2D to 3D Conversion

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EXAMPLES

certifi**3D**

The Certifi3D Standard

- 15 objective stereo reproduction criteria to ensure comfortable 3D viewing
- Values are dependent on viewing environment:
 - Theatrical
 - TV
 - Mobile

The Certifi3D Standard

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certifi3D Stereoscopic Quality Criteria

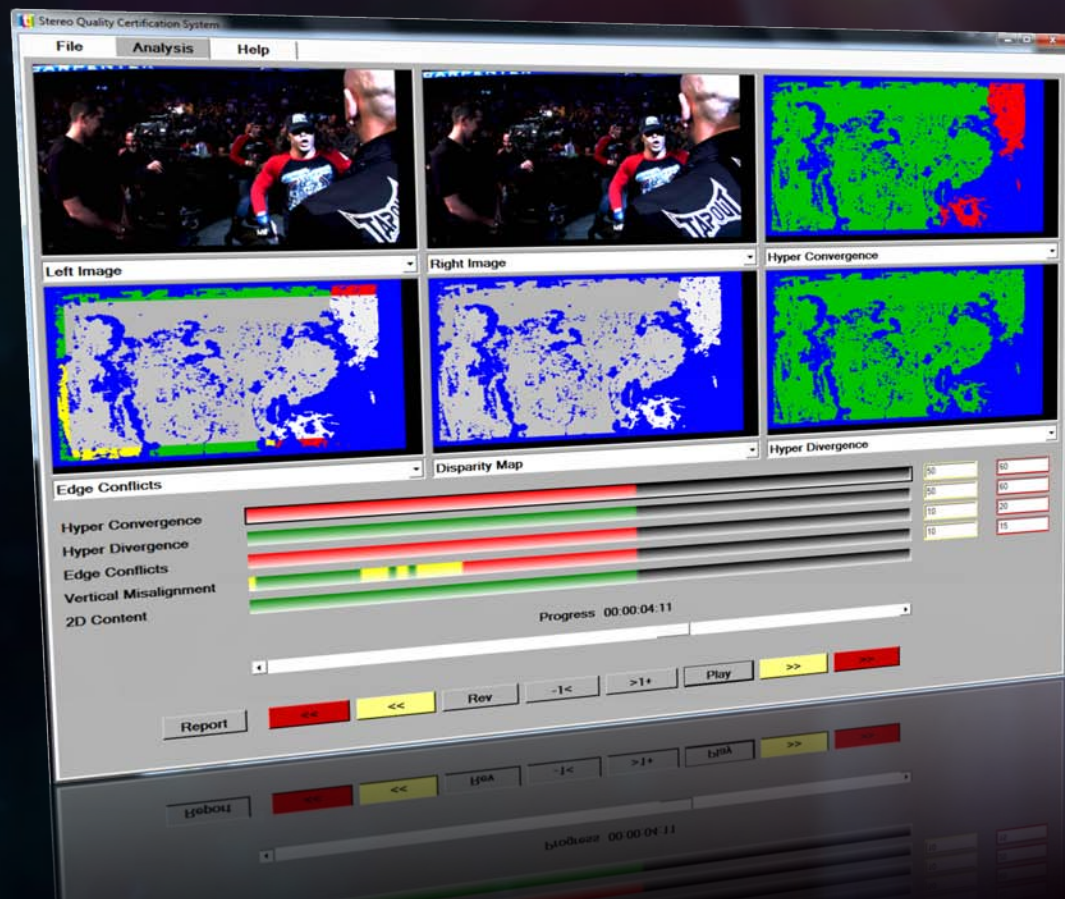


<p>1. Alignment/Geometry</p> <p>What is it? Imperfect vertical alignment of left and right images</p> <p>What causes it? Cameras not matched properly in production</p> <p>How to fix it? Geometry realignment</p>	<p>2. Luminance/Colorimetry</p> <p>What is it? Left image is brighter, darker or of a different hue than right image</p> <p>What causes it? Cameras not matched and/or lenses splitter diffraction</p> <p>How to fix it? Color adjustment</p>	<p>3. Depth of Field</p> <p>What is it? Focus not matching in the left and right eye</p> <p>What causes it? Different aperture settings/blur matching lens focus values</p> <p>How to fix it? Cannot be fixed without significant post-production work or blurring the focused image to match</p>	<p>4. Reflections, Polarization, Flares</p> <p>What is it? Reflections on shiny objects not matching the left and right images</p> <p>What causes it? Beam splitter polarization, camera angles</p> <p>How to fix it? Cannot be fixed without significant post-production work</p>
<p>5. Contamination</p> <p>What is it? Dust, water, dirt or other particles in one of the images</p> <p>What causes it? Challenges environment, lens/window not cleaned thoroughly</p> <p>How to fix it? Dust removal techniques</p>	<p>6. Sync/Gerlock</p> <p>What is it? Left and right images are not time accurate</p> <p>What causes it? Non-gerlocked cameras or editing error</p> <p>How to fix it? Sync the left, Gerlock issues cannot be fixed without significant post-production work</p>	<p>7. Full Reverse Stereo</p> <p>What is it? Left and right images are swapped</p> <p>What causes it? Data management or editing error</p> <p>How to fix it? Swap left and right images</p>	<p>8. Hyperconvergence</p> <p>What is it? Objects are too close to the viewer's eye to be viewed comfortably</p> <p>What causes it? Inappropriate camera settings or object going beyond the safe 3D zone</p> <p>How to fix it? Push convergence back, or compress the 3D space</p>
<p>9. Hyperdivergence</p> <p>What is it? Objects are too far back to be viewed comfortably</p> <p>What causes it? Inappropriate camera settings or objects going beyond the safe 3D zone</p> <p>How to fix it? Pull convergence forward or compress the 3D space</p>	<p>10. Edge Mismatch</p> <p>What is it? Left and right eye side edges not matching, either due to the addition of 'flaring' windows or beam splitter loss</p> <p>How to fix it? Remove flaring windows or match edge</p>	<p>11. Partial Reverse Stereo</p> <p>What is it? Some of the layers in a 3D composition are reversed left and right</p> <p>What causes it? 3D compositing error</p> <p>How to fix it? Swap incorrect layers in compositing. Cannot be fixed on the final image without significant post-production work</p>	<p>12. Depth Mismatch</p> <p>What is it? Elements within a 3D composition are not in the correct depth to the scene</p> <p>What causes it? 3D compositing error</p> <p>How to fix it? Fix composition. Cannot be fixed on the final image without significant post-production work</p>
<p>13. Visual Mismatch</p> <p>What is it? Elements within a 3D composition that do not match left and right</p> <p>What causes it? 3D compositing error</p> <p>How to fix it? Fix composition. Cannot be fixed on the final image without significant post-production work</p>	<p>14. 2D to 3D Ratio</p> <p>What is it? Too many shots in 2D to qualify the show as genuine 3D</p> <p>What causes it? Lack of 3D content</p> <p>How to fix it? Replace scenes scenes content with stereo content</p>	<p>15. High Contrast</p> <p>What is it? An element deep inside or far out of the window is high contrast with its environment, creating a double image on the display</p> <p>What causes it? Refresh rate of the display device (partial resolution of left and right images by the 3D glasses)</p> <p>How to fix it? Reduce contrast, change convergence or compress the 3D space</p>	

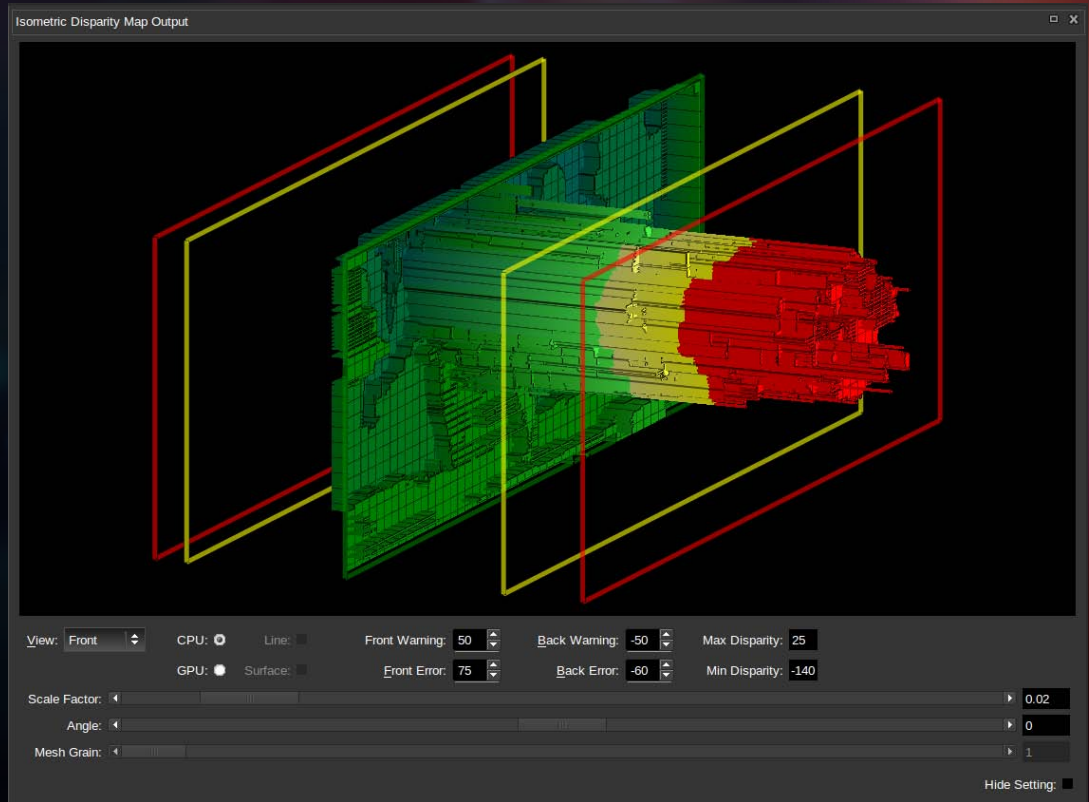
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and Color-Best Hollywood, CA 90001, USA
email: info@technicolor.com www.technicolor.com/3d

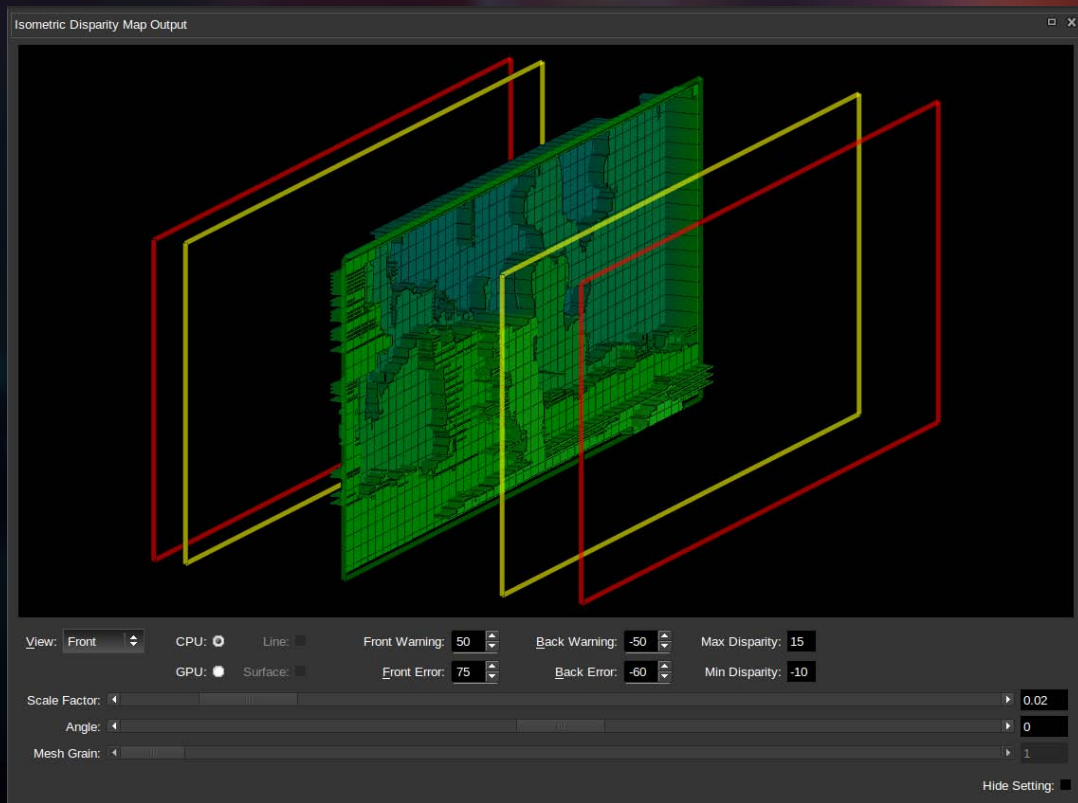
Control Environment



Hyperconvergent image



2.5D Image



Deployment of Certifi3D

certifi3D

Dailies

certifi3D

Home

certifi3D

Theatrical

certifi3D

Mobile

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THANK YOU

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THANK YOU