

Improvements to Color Matching in Multi-Projector Display Systems

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Industry standard practices for calibration of multi-projector display system white point were established at a time when display primaries were based on stable CRT phosphors. Since the phosphor's color coordinates did not change, calibrating the white point was simply a matter of getting the right ratio of red, green, and blue. A standard Three Filter Colorimeter (TFC) had acceptable precision to consistently balance the white point in multi-projector systems. This was despite limited accuracy in the reported color coordinates. This is no longer true. Expanding SPD diversity and variability has reduced the effective precision of the TFC. Today's light sources include Arc Lamp, LED, Laser Phosphor and more. This paper reports on demonstrated visual mismatch found regularly in modern multi-projector simulation applications if a TFC is used. Spectroradiometric devices are reviewed and found to provide a complete solution for white point calibration. Furthermore, Human Visual System (HVS) limits are used to determine minimal criteria for spectroradiometric devices used in simulation applications. An alternative framework is also presented to account for the disparity in SPD associated with different light sources, when using TFCs. This method requires only that the SPD of the primaries is known.

BIO

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Terry Linn is a Senior Staff Display Systems Engineer for the Visual Simulation division of FlightSafety International (FSI) in St. Louis, Missouri. His 32 years of experience has been applied to the design of the VITAL product line, Skylight projection system, and display systems delivered by FlightSafety. Besides his work at FlightSafety, he has served the Image Society as Display Systems Special Interest Group Chairman from 2006 to 2010. He received his Bachelor's degree in Electrical Engineering from University of Wisconsin in Madison.