

For expanded coverage of this month's topic "UHD/HDR," you can find the following papers in the Digital Edition. Visit the SMPTE digital library at <http://journal.smpte.org> to access the issue and to read these additional papers.

Predicting HDR Cinema Requirements from HDR Home Master Statistics

By Ronan Boitard, Michael Smith, Michael Zink, Gerwin Damberg, and Anders Ballestad

The high-dynamic-range (HDR) home video format launched several years ago and has been adopted by the industry such that HDR home masters are created for most new release titles and are released for home video distribution using ultrahigh-definition Blu-ray and digital formats. Mastering titles in HDR cinema is the next logical evolution toward higher quality content and is thus greatly anticipated. However, mastering for HDR cinema is still experimental due to a wide variety of potential HDR cinema display technologies and their unique dynamic range characteristics. Determining the required dynamic range for HDR cinema masters is thus of great interest. In this paper, we propose an estimation of two properties of the dynamic range required for HDR cinema masters based on two different data sets. The first data set corresponds to the dynamic range statistics and cumulative distribution function of 41 Warner Bros. HDR home masters. Analyzing this data set indicates that the maximum light level of a frame (the peak luminance values) is directly related to the frame average light level (FALL) of the frame. In other words, there is a maximum contrast between the intensity of the highlights in an image and the average intensity of

the image. The second data set is composed of matching mastered grades for standard dynamic range (SDR) cinema (Digital Cinema Initiative), enhanced dynamic range cinema (Dolby Cinema theatrical release), and HDR home formats. Paired matching of content is useful to derive a translation between grades. By performing a cross-analysis between SDR and enhanced dynamic range (EDR) cinema content, we estimate a trend on the evolution of the FALL statistic when an HDR is provided. A second cross-analysis between HDR home and EDR cinema characterizes the translation of midtones between small screens with surround illumination to big screens in a dark viewing environment. Using different analyses, we predict two optimized properties of the dynamic range needed to represent the most future HDR cinema mastered content.

European Athletics Championships: Lessons from a Live, HDR, HFR, UHD, and Next-Generation Audio Sports Event

By Frans de Jong, Dagmar Driesnack, Andrew Mason, Matthieu Parmentier, Paola Sunna, and Simon Thompson

The European Broadcasting Union and several of its member organizations undertook an ambitious trial over the summer period—a live, ultrahigh-definition, high-dynamic-range, high-frame-rate, wide-color-gamut, and next-generation audio trial at the European Athletics Championships in Berlin, Germany. The trial included four 2160p/100 cameras with live control of shading/racking, live vision mixing, live recording, live mixing of audio objects, audiovisual synchronization with audio objects, and live encoding. This paper looks at the lessons learned during the trial—what went well, what needed extra work, and what is needed to overcome current technical hurdles.



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