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Evaluating the Performance of Existing Full-Reference Quality Metrics on High Dynamic Range (HDR) Video Content

Authors : Maryam Azimi, Amin Banitalebi-Dehkordi, Yuanyuan Dong, Mahsa T. Pourazad, Panos Nasiopoulos

Abstract : While there exists a wide variety of Low Dynamic Range (LDR) quality metrics, only a limited number of metrics are designed specifically for the High Dynamic Range (HDR) content. With the introduction of HDR video compression standardization effort by international standardization bodies, the need for an efficient video quality metric for HDR applications has become more pronounced. The objective of this study is to compare the performance of the existing full-reference LDR and HDR video quality metrics on HDR content and identify the most effective one for HDR applications. To this end, a new HDR video data set is created, which consists of representative indoor and outdoor video sequences with different brightness, motion levels and different representing types of distortions. The quality of each distorted video in this data set is evaluated both subjectively and objectively. The correlation between the subjective and objective results confirm that VIF quality metric outperforms all to their tested metrics in the presence of the tested types of distortions.

Keywords : HDR, dynamic range, LDR, subjective evaluation, video compression, HEVC, video quality metrics
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