

Efficient Atlas Coding Strategy using cropping for Object-based MPEG Immersive Video

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In this study, we propose an efficient atlas coding strategy for the object-based MPEG Immersive Video (MIV) coding standard. The main concept of Object-based MIV is to use a video codec, such as High Efficiency Video Coding (HEVC) or Versatile Video Coding (VVC), to compress the 2D atlas videos generated from objects of interest videos taken through multiple cameras located in multiple positions in 3D space. However, the current coding method on the atlas in MIV is not effective for coding the objects of interest in videos because there are some cases where the atlas has an unnecessary area generated from the MIV encoder. If there is such an area that is not used in the atlas, the amount of computation required for coding can be reduced by decreasing the atlas resolution during encoding. The proposed method shows that the weighted-to-spherically uniform PSNR (WS-PSNR) based Bjøntegaard delta rate gains between -8.2% and -10.1%, and the Immersive Video PSNR (IV-PSNR) based on the Bjøntegaard delta rate gains between -5.7% and -7.1% compared to the reference model of MIV.

Keywords— Immersive video coding, MPEG immersive video, 6DoF video coding, Object-based coding, Metaverse, versatile video coding, high efficiency video coding



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