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| **Title** | **[G-PCC] [New proposal] Improved encode parameters for Lifting attribute coding.** |
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# Abstract

In current G-PCC specification, the Level of Detail (LoD) generation method supports both subsampling by distance, and subsampling by decimation. The subsampling by distance method uses a sequence of distances to compute a set of LoDs, which are leveraged by the lifting-based attribute coding.

In this contribution, we propose improved encode parameters for the distance-based LoD generation scheme. Under the C1 test condition of the CTC [1], the proposed parameters offer 3%, 1.6% and 2.1% average Y-BD, Cb-BD and Cr-BD rate gains, respectively.

# Proposal

In the configuration generation file sequences-cat1.yaml, the sequence of distances is specified by the encode parameter *seq\_dist2*. Table 1 compares the initial and updates values for *seq\_dist2.*

|  |  |  |
| --- | --- | --- |
| Sequence | Initial *seq\_dist2* | Updated *seq\_dist2* |
| basketball\_player\_vox11\_00000200 | 3 | 2 |
| dancer\_vox11\_00000001 | 3 | 2 |
| facade\_00064\_vox11 | 3 | 2 |
| longdress\_vox10\_1300 | 3 | 2 |
| loot\_vox10\_1200 | 3 | 2 |
| queen\_0200 | 3 | 2 |
| redandblack\_vox10\_1550 | 3 | 2 |
| soldier\_vox10\_0690 | 3 | 2 |
| thaidancer\_viewdep\_vox12 | 3 | 2 |
| facade\_00009\_vox12 | 12 | 15 |
| facade\_00015\_vox14 | 48 | 42 |
| frog\_00067\_vox12 | 12 | 15 |
| head\_00039\_vox12 | 8 | 9 |
| house\_without\_roof\_00057\_vox12 | 12 | 14 |
| shiva\_00035\_vox12 | 48 | 51 |
| boxer\_viewdep\_vox12 | 3 | 14 |
| longdress\_viewdep\_vox12 | 3 | 9 |
| loot\_viewdep\_vox12 | 3 | 10 |
| redandblack\_viewdep\_vox12 | 3 | 10 |
| soldier\_viewdep\_vox12 | 3 | 10 |
| ulb\_unicorn\_vox13 | 192 | 176 |
| egyptian\_mask\_vox12 | 192 | 285 |

Table 1. Encode parameter *seq\_dist2:* Initial vs. Update values.

# Experimental results

The RD performances of the TMC13v7 anchor with the initial and updated encode parameters were compared under the CTC conditions. Detailed results are provided in the attached excel sheet. Figure 1 summaries the gains obtained with the new parameters. On average, the following gains are obtained:

* an average Y-BD rate of 3%,
* an average Cb-BD rate of 1.6%, and
* an average Cr-BD rate of 2.1%.

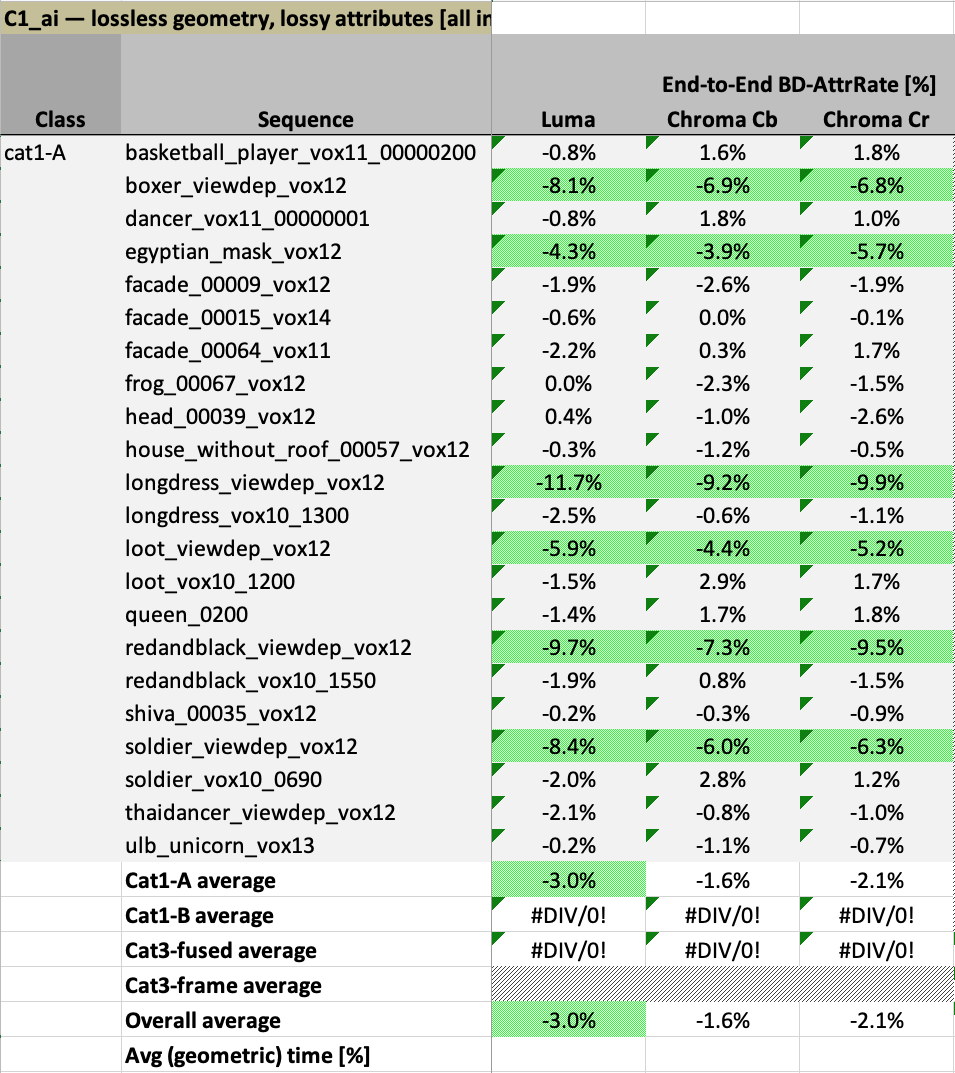


Figure 1. BD rate gains obtained by the proposed encode parameters vs. the CTC parameters.

# Conclusion

In this contribution, we proposed improved encode parameters for the distance-based LoD generation scheme. Under the C1 test condition of the CTC, the proposed parameters offer 3%, 1.6% and 2.1% average Y-BD, Cb-BD and Cr-BD rate gains, respectively. Based on these results, we recommend the adoption of the proposed parameters in the G-PCC CTC.

# References

1. “Common Test Conditions for PCC” ISO/IEC JTC1/SC29 WG11 MPEG2019 Doc. N18474, Geneva, CH, March 2019.