ISO/IEC JTC 1/SC 29/WG 11

Coding of moving pictures and audio

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Abstract

Exploratory experiment 13.46 intends to systematically evaluate the attribute coders currently present in the current draft specification, and those proposed for in inclusion. The activity is intended to determine the suitability of the various options to different usage scenarios.

Mandate

The mandate of the exploratory experiment is to —

- evaluate the various adopted and proposed attribute coders to determine their performance on, and suitability to, each content type / application requirement.

- evaluate the system level performance of geometry and attribute coding for each content type / application requirement.

- evaluate the scaling of geometry positions for reducing RAHT complexity.

- review attribute coders to identify inefficiency in current implementations.

- evaluate alternative attribute coding orders applied to each attribute coder.

- evaluate the applicability of scalable attribute coding to each attribute coder.

- recommend changes to the draft specification.

Participants

Company	Contact	E-mail	Status
Apple	David Flynn	davidflynn@apple.com	Proponent
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Timeline

2020-07-31	Expected release of TMC13v11
2020-10-07	MPEG 132 document upload deadline
2020-10-12	MPEG 132

Evaluation

All CTC [1] test conditions for TMC13 will be evaluated using category one and three content. Additional configurations shall be investigated to explore the coding tool parameters'. In particular these should include scalable operating points.

The evaluation should be conducted in several stages:

1. Evaluate techniques that reduce complexity or simplify implementation

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2. Review aspects related to attribute coding order

3. Perform the primary mandate

Description of proposals

w19522 – Predicting / Lifting transforms with layers of detail

The current draft [2] includes a set of transforms that implement a generalised lifting scheme across multiple layers of detail. A prediction-only variant permits bounding the maximum error of coded attribute data.

These attribute coders may be parameterised by the number of levels of detail, the method used to construct the levels of detail, the search ranges used for neighbour (predictor) discovery, and the maximum number of predictors to predict each attribute value.

w19522 – RAHT

The current draft includes a region-adaptive hierarchical transform. The current design includes support for transform domain prediction of coded attribute values based upon upsampling of the previous transform level.

m53446 – RAHT (TMC13v6)

An earlier version of the region-adaptive hierarchical transform was included in TMC13v6 [3] before the adoption of the current form. This design was notable for using a lifting approach to simplify computation. It does not support transform domain prediction.

m54267 – RAHT (Haar)

The weighting processes that exist in RAHT can cause issues with supporting partial decoding of a point cloud or lossless attribute coding. The use of the Haar transform can address both of these issues.

References

[1] 3DG, "Common Test Conditions for G-PCC," ISO/IEC JTC1/SC29/WG11, 131st meeting, OnLine, Tech. Rep. w19584, Jun. 2020.

[2] ——, "G-PCC Future Enhancements," ISO/IEC JTC1/SC29/WG11, 131st meeting, OnLine, Tech. Rep. w19522, Jun. 2020.

[3] A. Zaghetto, D. Graziosi, and A. Tabatabai, "[G-PCC] TMC13v6 Implementation as a Low-complexity Point Cloud Coder for Category 3," ISO/IEC JTC1/SC29/WG11, 130th meeting, Alpbach, Tech. Rep. m53446, Apr. 2020.