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**ISO/IEC JTC 1/SC 29/WG 11**

**CODING OF MOVING PICTURES AND AUDIO**

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| **Title:** | **Description of Exploration Experiment 13.34** **on filter based attribute prediction** |

1. **Introduction**

This document provides a description of the exploration experiment 13.34 for filter based attribute prediction scheme on G-PCC proposed in [1].

The neighbour searching-based prediction scheme for attribute compression in TMC13v8 only considers the Euclidean distance between neighbours and current point without full consideration of the geometry distribution of those neighbours with respect to current point. When the nearest neighbours are selected in the pred mode based on Euclidean distance, we cannot guarantee that all the neighbours are evenly distributed around the current point. The goal of EE13.34 is to further study and evaluate the enhanced attribute prediction scheme based on filters.

1. **Mandates**

The mandates for EE 13.34 are as follows:

* To implement the fixed point version of the filter based attribute prediction scheme
* To further obtain best parameters for the attribute filter.
* To evaluate the compression performance of the filter based attribute prediction scheme.
* To evaluate the complexity of the filter based attribute prediction scheme.

1. **Participants**

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1. **Method to be evaluated**

A filter-based enhanced intra prediction method for point cloud attribute lossless/near-lossless compression need to be evaluated upon updated test model of G-PCC under the latest CTC.

In m52828 [1], we propose a filter-based enhanced attribute prediction scheme upon TMC13v8. Modifications of pred scheme in the encoder and decoder side are shown in Fig 1 and Fig 2, respectively. The proposed scheme fully consider the geometry distribution of selected neighbours of current point andit would have more potential to get better predictors of attribute.



Fig.1 Proposed modifications of the filter-based enhanced pred scheme in the encoder.



Fig.2 Proposed modifications of the filter-based enhanced pred scheme in the decoder.

The neighbour searching-based pred scheme for attribute compression in TMC13v8 only considers the Euclidean distance between neighbours and current point without full consideration of the geometry distribution of those neighbours with respect to current point. When the nearest neighbours are selected in the pred mode based on Euclidean distance, we cannot guarantee that all the neighbours are evenly distributed around the current point. So we proposed our method.

1. **Test model, anchors and CTC**

The latest G-PCC reference software [3] will be used as the anchor for this EE.

All tests will be conducted on categories 1 and 3-fused average datasets under the latest CTC [2].

1. **Timeline:**

* **2020-02-25**: Expected date for release of cross-verified new TMC13v9 software and anchors;
* **2020-03-20**: Deliver source code and results for cross check;
* **2020-04-03**: Preliminary feedback from cross-checkers to proponents
* **2020-04-15**: MPEG document upload deadline.

1. **References**
2. “An enhanced attribute prediction scheme based on filters”, ISO/IEC JTC1/SC29/WG11 input document. M52828, Brussels, Belgium, January 2020.
3. “Common Test Conditions for PCC” ISO/IEC JTC1/SC29 WG11 MPEG2019”, ISO/IEC JTC1/SC29/WG11 MPEG Doc. w19084, Brussel, Belgium, January 2020.
4. “G-PCC Test Model v9”, ISO/IEC JTC1/SC29/WG11 MPEG Doc. W19083, Brussel, Belgium, January 2020.