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**CODING OF MOVING PICTURES AND AUDIO**

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**PCC Core Experiment 0.2 on Content**

# Abstract

This document provides a description of Core Experiment 0.2 on the new PCC content that was contributed to the PCC group in recent MPEG PCC meetings but has not yet been included in the PCC CTC.

# Introduction

The goals of CE0.2 are to:

1. Investigate the new MPEG PCC content. Decide what (if anything) needs to be modified in the content so that it is in a state where the V-PCC and G-PCC Test Models (PCC TMs) can be run on it, and so that it fits within the requirements outlined in the CTC document.
2. Prepare the content according to the decisions made in step 1.
3. Run the PCC TMs on the new content, for the category for which the content was intended by the contributors, under the corresponding CTC conditions, to make sure that the PCC TMs and the metric software works as expected, and to produce anchor results for the new datasets.
4. To maintain the CTC sequence on the MPEG content server.

The experimental results of this CE will be evaluated by the 3DG/PCC AhG. The desired end goal is that the new content will then be recommended for inclusion in the PCC CTC, for the category/ies for which the content was intended by the contributors.

# Descriptions of Contributed Datasets

The contributed datasets in question contain: dynamic (multi-frame) point cloud sequences. The contributed dynamic (excluding dynamically captured) datasets represent a single person in the scene. The contributions are summarized below:

## Fraunhofer HHI sequences

Fraunhofer HHI [2, 3] contributed 2 dynamic, 200-frame (8 s) point cloud sequences, intended for Category 2. The point x, y, z positions are floating-point values, and the R, G, B colour values are 8-bit integers. The images in Figure 2 show the point clouds from one example frame and one example viewpoint in each case.



Figure 1 Fraunhofer HHI content

## Samsung sequences

Samsung [5] contributed one 300-frame (10 s) point cloud sequence, intended for Category 2. The point x, y, z positions are floating-point values, and the R, G, B colour values are 8-bit integers. The image in Figure 4 shows the point cloud from one example frame and one example viewpoint.



Figure 2 Samusung content

## Mesh sequences generated from Point cloud

m53533 provides information to generate the Mesh sequence from the Point cloud in CTC. The conversion process will be verified in the activity.

  

 

Figure 3. Snapshots of the 10-bit meshes generated from the CTC point clouds



Figure 4. Snapshots of the 10-bit sparse meshes with per-vertex color generated from the Owlii’s meshes

# Mandates

The mandates for CE0.2 are as follows:

1. Investigate the new MPEG PCC content that was recently contributed by Fraunhofer HHI [2, 3] and Samsung [5], and decide what (if anything) needs to be modified in the content so that it is in a state where the appropriate TMs and the metric can be run on it, and so that it fits within the requirements outlined in the CTC document.Prepare the content according to the decisions made in step 1.
2. Run the TMs on the new content, for the category for which the content was intended by the contributors, under all the corresponding CTC conditions, to make sure that the TMC software, and to produce anchor results for the new datasets.
3. Provided that the content is deemed usable by the PCC group according to the results of the investigation and experiments described above, recommend the content for inclusion in the PCC CTC, for the category/ies for which the content was intended by the contributors.
4. To maintain the CTC content on the content server.

## CE activity

1. Prepare the content to enable it to be used with the latest versions of the TMs (according to the category/ies for which the content was intended by the contributors) and the metric software, and so that it fits within the CTC conditions. In most cases, the companies that provided the content will be responsible for preparing their own content; if this is not possible, another company in the PCC group has been assigned to this task, as described below.
   1. HHI content:
      1. Provide a cleaner version of the original datasets and integerize x, y, z values for both datasets.
      2. The action is coordinated by Technicolor.
   2. Samsung content:
      1. Provide a cleaner version of the original dataset. (Samsung staff outsde the PCC group), and integerize x, y, z values.
      2. The action is coordinated by Samsung (MPEG delegates).
   3. Mesh content from Point cloud:
      1. Provide a method (e.g. Script) to generate the Mesh content from the Point cloud
      2. Provide information (e.g. md5sum) to verify the generated Mesh is identical
      3. The action is coordinated by Samsung (MPEG delegates).
2. Each proponent (or a company acting on their behalf, as noted in step 1, above) will test their own content with the latest TMs, for the category/ies for which they intended the content to be used, under all the test conditions for those categories, as specified in the CTC document and the associated Excel spreadsheet. All the tests are conducted on V-PCC Test Model. The Owlii content test will also be conducted on G-PCC Test Model.

The goals of these tests are to:

* 1. Check that the corresponding TMs, as well as the metric software, can read in the input data. If the software crashes or does not work as expected, contact the software coordinator to see if it can be fixed quickly; if not, provide an input document for the next MPEG meeting, to detail what needs to be changed in the software to enable it to be used with the new content, or else propose how the content should be modified further in order to be able to use it with the software.
  2. Provide the anchor results for the new content, using the appropriate test conditions specified in the CTC.

3. The CE participants works for the CTC content on the MPEG content server.

* To upload the missing CTC content ( i.e. Facade\_00064\_vox11 ) on the server with the necessary supplemental information (i.e. copyright, source info)
* To tidy the CTC content accessibility
  + e.g. Category based clean-up, sequence by sequence accessibility, md5sum maintainance.

Regarding the maintainance work, to use the following folder structure is suggested.

* + /ctc\_test\_sequences:
    - zip individual sequences (ply, copyright，any processing documents such as readme, md5 for ply)
    - cat2/3: each sequence includes multiple ply files;
    - one MD5 with one entry per line
    - Generate MD5 using binary option (md5sum in linux)
  + /candidate\_test\_sequences:
    - store those sequences which may become test sequences in the future
  + /archived\_test\_sequences
    - store old version of test sequences, clear named such as \*\_float.zip, or different versions of ctc\_test\_sequences for archive purpose

## Participants

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Participant*** | ***Contact*** | ***Email*** | ***topic*** | ***Type*** |
| Sony | Ohji Nakagami | ohji.nakagami@sony.com | CTC content maintenance | C |
| Tencent | Wen Gao | wengao@tencent.com | CTC content maintenance | C |
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| Fraunhofer HHI | Thomas Ebner | thomas.ebner@hhi.fraunhofer.de | HHI dataset (Cat 2) | P |
| InterDIgital | Ralf Schaefer | ralf.schaefer@interdigital.com | HHI dataset (Cat 2) | C |
| KDDI | Kyohei Unno | [ky-unno@kddi-research.jp](mailto:ky-unno@kddi-research.jp) | CTC content maintenance | C |

(P = proponent, C = cross checker)

# Document and Software References

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