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Title: [VCM][CE0] Results of CE0.8
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Abstract

This document contains the results of CE0 test 8 (CE0.8) – Neural-Network-based Chroma Reconstruction turned off, performed between 149th and 150th MPEG meetings.

1. Procedure description

The purpose of the CE0.8 test was to estimate the coding gain that comes from the Neural-Network-based Chroma Reconstruction coding tool of the VCM codec. This test is done by coding and evaluation of the test datasets using VCM codec (VCMRS v0.12) with NN-based Chroma Reconstruction module bypassed and comparison the results with the current anchor.

The test was performed following the CE0 description [1]. The coding scripts have been modified and committed to the dedicated branch for CE0 on Gitlab. For this test, there were no need to change any descriptors for any other tools.

We have done the encoding and evaluation using the machines with the following specification:

- Processor: Intel Core i7-12700K
- RAM: 32 GB
- GPU: nVidia RTX 4090.
- Operating System: Ubuntu 22.04 (updated)

2. Results

The detailed results can be found in the attached excel file. The summary is presented in the tables below.

Table 1. Results for the object detection task

Object Detection		End-to-End BD-Rate [%]					
		Inner			E2E		
		RA	LD	AI	RA	LD	AI
SFU-HW	Class A	-0.01%	-0.01%	-0.01%	-0.01%	-0.20%	-0.01%
	Class B	-0.02%	-0.01%	-0.04%	-0.01%	-0.11%	-0.02%
	Class C	0.02%	0.00%	-0.02%	-0.01%	-0.06%	-1.10%
	Class D	-0.01%	-0.01%	-0.38%	-0.01%	-0.11%	-0.40%
	Average	0.00%	0.00%	-0.14%	-0.01%	-0.10%	-0.50%
	Class O	-6.02%	-2.40%	-0.42%	-3.64%	-1.41%	#####

Table 2. Results for the object tracking task

Object Tracking		End-to-End BD-Rate [%]					
		Inner			E2E		
		RA	LD	AI	RA	LD	AI
TVD	TVD-01-1	0.00%	-0.01%	-0.06%	-0.01%	-0.26%	-0.02%
	TVD-01-2	-0.01%	-0.01%	-0.06%	-0.02%	-0.31%	-0.02%
	TVD-01-3	-0.01%	0.00%	-0.08%	-0.01%	-0.16%	-0.05%
	TVD-02-1	-0.01%	-0.01%	-0.05%	-0.01%	-0.24%	-0.02%
	TVD-03-1	44.72%	7.21%	43.18%	36.98%	9.39%	53.15%
	TVD-03-2	44.52%	33.39%	43.87%	38.74%	21.25%	46.86%
	TVD-03-3	374.95%	267.69%	89.75%	203.62%	98.75%	#####
	Average	66.31%	44.04%	25.22%	39.90%	18.34%	#####

3. Acknowledgements

Thanks to Yegi Lee from Konkuk University for crosschecking the experiment.

4. References

[1] ISO/IEC JTC 1/SC 29/WG 4, “VCM-CE 0: Tool experiments”, doc. N0640, January 2025, Geneva.