INTERNATIONAL ORGANISATION FOR STANDARDISATION
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ISO/IEC JTC1/SC29/WG4
MPEG VIDEO CODING

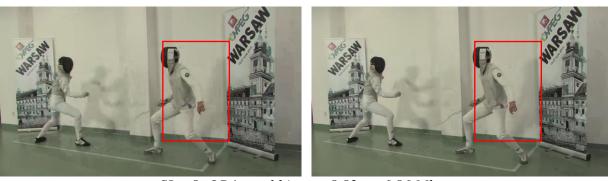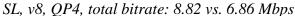|	
Source	**Poznań University of Technology (PUT), Poznań, Poland**
Status	**Input**
Title	**PUT results for EE1 on Coding for Future MPEG Immersive Video**
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1   Introduction

This document provides the results of EE1 experiments [N19491] performed by PUT.

2   Experimental results

2.1   EE1.a: Anchor generation

SL, v8, QP4, total bitrate: 8.82 vs. 6.86 Mbps

SU, v4, QP5, total bitrate: 4.70 vs. 3.82 Mbps

Fig. 1. HEVC vs. VVC – subjective differences.

Table 1. Objective quality evaluation.

Mandatory content - Proposal vs. Low/High-bitrate Anchors | | | **Runtime ratio (%)**

Sequence		High-BR BD rate Y-PSNR	Low-BR BD rate Y-PSNR	Max delta Y-PSNR	High-BR BD rate VMAF	Low-BR BD rate VMAF	High-BR BD rate IV-PSNR	Low-BR BD rate IV-PSNR	Pixel rate [%]	Pixel rate [GP/s]	Frame rate [Hz]	TMIV encoding	HM encoding	HM decoding	TMIV decoding
Carpark	SP	-30.4%	-30.2%	8.01	-32.5%	-33.0%	-18.1%	-22.2%	52%	0.56	25	583.7%	588.9%	######	135.6%
MIV		**-30.4%**	**-30.2%**	**8.01**	**-32.5%**	**-33.0%**	**-18.1%**	**-22.2%**	52%	0.56		583.7%	588.9%	######	135.6%

Optional content - Proposal vs. Low/High-bitrate Anchors

Sequence		High-BR BD rate Y-PSNR	Low-BR BD rate Y-PSNR	Max delta Y-PSNR	High-BR BD rate VMAF	Low-BR BD rate VMAF	High-BR BD rate IV-PSNR	Low-BR BD rate IV-PSNR	Pixel rate [%]	Pixel rate [GP/s]	Frame rate [Hz]	TMIV encoding	HM encoding	HM decoding	TMIV decoding
Fencing	SL	-31.5%	-30.4%	13.54	-33.3%	-34.1%	-24.0%	-26.4%	52%	0.56	25	809.0%	808.2%	######	72.8%
Hall	ST	-33.0%	-33.5%	12.35	-39.5%	-42.1%	-24.8%	-25.0%	52%	0.56	25	545.5%	549.8%	######	137.8%
Street	SU	-30.5%	-30.6%	11.46	-36.8%	-36.9%	-14.4%	-19.6%	52%	0.56	25	1033.1%	1043.9%	######	44.0%
MIV		**-31.7%**	**-31.5%**	**12.45**	**-36.5%**	**-37.7%**	**-21.1%**	**-23.7%**	52%	0.56		795.9%	800.6%	######	84.9%

All the objective quality metric BD-rates show significant improvement. However, the time of encoding also increased, especially for lower compression. Encoding time of 17frame-long first atlas of SU sequence was over 20.5 hours (instead of ~50 minutes needed for HM software).

Full results for sequences SP, SL, ST and SU are attached in: m54943_A17_HEVC_vs_VVC.xlsm

2.2 EE1.b: QP refinement

Full results for QP6 are attached in: m54943_A17_HEVC_vs_VVC_QP6.xlsm

For sequences SD, SE, SL and SO, maximum QP was already reached for QP5 rate point. Therefore, QP6 results for these sequences were not generated.

3 Acknowledgement

4 References

[N19491]   "Exploration Experiments on Coding for Future MPEG Immersive Video"
ISO/IEC JTC1/SC29/WG11 MPEG/N19491, July 2020, Online.