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Title: **Exploration Experiments on Future MIV: PUT results**
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Abstract & Recommendations

The document presents the results of EE-related experiments that were conducted by PUT. The results include full results of EE1 and EE2.1. The recommendation is that the EE1 should be continued to test the performance of the new TMIV 10.0 if considerable changes will be made to CTC, while EE2.1 should be continued to further explore the performance of MV-HEVC in comparison with TMIV.

1 Introduction

The document presents the results of EE-related experiments that were conducted by PUT. The results include full results for EE1 and EE2.1, which can be found in the attached reporting templates.

2 Experiments

For EE1, GCC 10.2.0 was used to compile all used software, while for EE2.1, VS10 was used.

2.1 EE1

The experiment tested the performance of depth maps estimated by IVDE in comparison with the current CTC depth maps. The table below compares the performance of the A17 anchor against the new depth maps (estimated at the TMIV encoder side).

Comments:

- As expected, the quality of depth maps generated in the experiment is lower than for CTC depth maps. The depth maps in this experiment are generated using the same estimation parameters for all sequences, while for CTC depth maps (even if they were generated earlier using IVDE), the parameters were fine-tuned to give the best possible quality.

- The high quality in SO, as previously, is the result of much higher redundancy in atlases when estimated depth maps are used (more information from input views is transmitted, resulting in the increased quality of synthesized views). There are also fewer high-frequency edges in depth maps (fewer details on a fan), which decreased the bitrate of encoded geometry atlases.
- A high BD-rate decrease was observed for SE and ST. The possibility of generating new CTC depth maps for this sequence is considered.
- The quality of SI is identical as in MIV Anchor since depth maps from the previous EE are used now in this anchor and no changes to the IVDE were made.
- **If this EE will be continued, its description should be more precise, to eliminate typical, easy to avoid, configuration errors.**

Mandatory 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 IV-PSNR	Low-BR BD rate IV-PSNR
ClassroomVideo	A	---	637.0%	4.35	494.1%	391.8%
Museum	B	---	---	18.30	1151.6%	547.2%
Fan	O	-63.1%	-62.0%	5.98	-40.3%	-44.7%
Kitchen	J	80.3%	52.7%	14.36	49.4%	36.2%
Painter	D	43.5%	35.4%	9.07	53.2%	38.7%
Frog	E	-14.7%	-6.1%	6.23	-4.3%	0.4%
Carpark	P	34.8%	45.5%	6.95	40.1%	48.9%
Chess	N	---	---	27.13	---	---
Group	R	---	---	23.38	---	---
MIV		**---**	**---**	**12.86**	**---**	**---**

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

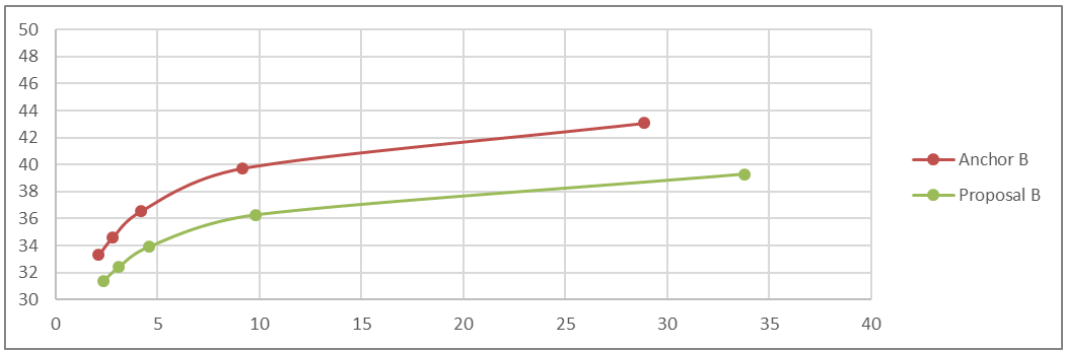
Fencing	L	1.4%	22.8%	8.95	2.9%	24.9%
Hall	T	-63.8%	-54.6%	10.55	-45.7%	-45.9%
Street	U	13.4%	18.4%	8.34	16.5%	21.0%
ChessPieces	Q	---	---	27.71	---	---
Hijack	C	---	---	22.21	---	---
Mirror	I	0.0%	0.0%	8.77	0.0%	0.0%
MIV		**---**	**---**	**14.42**	**---**	**---**

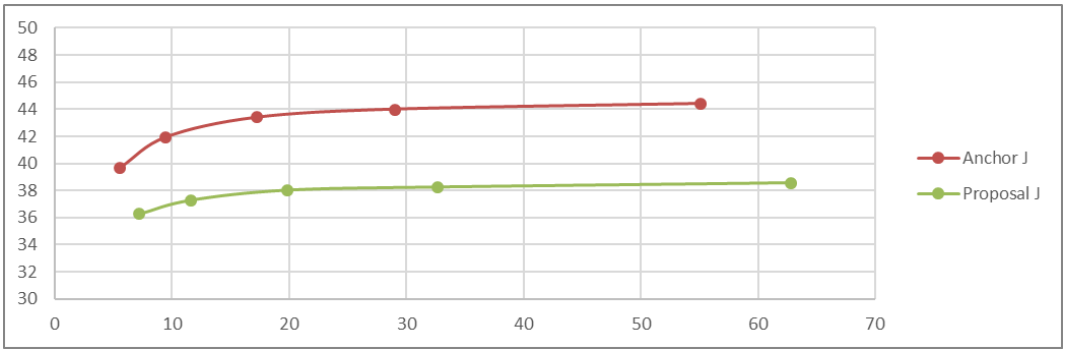
Recommendations:

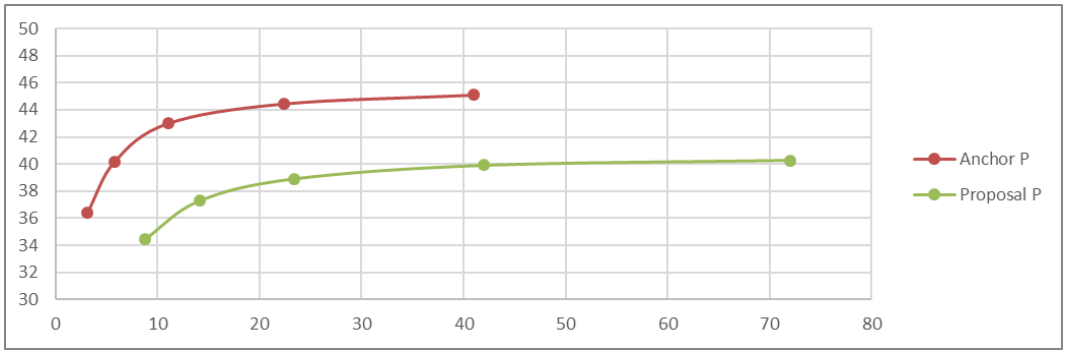
- EE1 should be continued to test the performance of the new TMIV 10.0 if considerable changes will be made.

2.2 EE2.1

The experiment tested the performance of MV-HEVC in MIV CTC conditions (17 frames). PUT was testing B, J and P sequences. The comparison of MIV Anchor (Anchor) and MV-HEVC (Proposal) is shown below.







Comments:

- QPs were not defined, different testers used different values. Still, RD-curves were overlapping, therefore, cross-check was successful.
- MV-HEVC is showing worse performance and TMIV for all sequences (objectively).

Recommendations:

- EE2.1 should be continued to further explore the performance of MV-HEVC in comparison with TMIV.

Acknowledgement

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