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Title: AHG4: first report of spatial scalability verification tests

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Source: InterDigital, INSA

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Abstract

This contribution reports the results a formal visual quality assessment of VVC in spatial scalability mode, following preparation work described in JVET-X0202. With equal bitrate for base HD and enhancement UHD layer, PSNR-Y based performance is -24% vs simulcast, while MOS-based performance is around -15%; other layer bitrate allocations are tested in JVET-Y0048. Part of those results were used as a subjective evaluation report of VVC scalable profile in response to the TV 3.0 project Call for Proposals from the Brazilian Digital Terrestrial TV Forum (see JVET-U0128, JVET-V0167 and JVET-X0202). Beyond that, these tests can be used as a basis for JVET verification tests of VVC in scalable mode.

Introduction

The Brazilian Digital Terrestrial TV Forum (SBTVD Forum) has released in July 2020 a publicly available Call for Proposals [1][2] for the specification of the next generation of the Brazilian Digital Terrestrial Television system, named "TV3.0" project. For the video coding part, VVC has been proposed by several organizations, namely DiBEG, Ateme, Fraunhofer HHI, and Interdigital, as a candidate addressing both single-layer coding and scalable dual-layer coding.

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CARD<http://vexpertise.stbit.ru/documents/JVET-Y0047>

https://jvet-experts.org/doc_end_user/documents/25_Teleconference/wg11/JVET-Y0047-v1.zip



https://jvet-experts.org/doc_end_user/current_document.php?id=11239



http://vexpertise.stbit.ru/meeting-notes/source/meeting_25_y



MEETING NOTES

[JVET-Y0047](#) AHG4: First report of spatial scalability verification tests [P. de Lagrange, F. Urban, E. François (InterDigital), W. Hamidouche (INSA)]

This contribution reports the results a formal visual quality assessment of VVC in spatial scalability mode, following preparation work described in JVET-X0202. With equal bit rate for base HD and enhancement UHD layer, PSNR-Y based performance is -24% vs simulcast, while MOS-based performance is around -15%; other layer bit rate allocations are tested in JVET-Y0048. Part of those results were used as a subjective evaluation report of VVC scalable profile in response to the TV 3.0 project Call for Proposals from the Brazilian Digital Terrestrial TV Forum (see JVET-U0128, JVET-V0167 and JVET-X0202). Beyond that, these tests can be used as a basis for JVET verification tests of VVC in scalable mode.

2x spatial scalability is investigated.

Performance comparison vs. simulcast and single-layer

Unlike SHVC verification test, which used 0.5 s IRAP period, 1 s was used

MCTF preprocessing was not found effective in scalable coding

Base layer and low res in simulcast almost identical

Quality/rate of base vs. enhancement layer was equivalent to SHVC verification test.

From sequences that were previously used in SHVC verification tests, it is concluded that gain against simulcast are similar (with PSNR based criteria).

Base layer quality might not be chosen in an optimum way over the different rate points. needs to be improved. It is also suggested that one possibility would be including an upsampled base layer to determine appropriate settings. Cases should be investigated where scalability has demonstrable benefit. Also, it should be avoided that quality saturates at the high rate end.

The base layer should be viewable.

At the highest rate points, saturation occurs.

Should a verification test include SHVC, or would it be sufficient to demonstrate the benefit vs. simulcast?

It was suggested to further investigate the definition of a scalable VVC verification test, in particular with regard to the optimum rate/quality settings for base and enhancement layers. Put this as mandate of AHG4.

JVET-Y0048 is also related to this.

Test material (3)

Contributions in this area were discussed in session 13 at 1445–1520 UTC on Monday 17 Jan. 2022 (chaired by JRO) and in session 24 at 0010–0030 UTC on Friday 21 Jan. 2022 (chaired by JRO).

JVET-Y0042 (section 4.10) is also related.

CITATION

P. de Lagrange, F. Urban, E. François, W. Hamidouche, "AHG4: first report of spatial scalability verification tests", JVET-Y0047, 25th Meeting: by teleconference, January 2022.

REFERENCES

1. [JCTVC-V0069](#)
2. [JCTVC-W1004](#)
3. [V. Baroncini, M. Wien, "VVC verification test report for UHD SDR video content", JVET-T2020, 20th Meeting: by teleconference, October 2020.](#)
4. [M. Raulet, T. Biatek, T. Guionnet, B. Bross, P. de Lagrange, R. Schaefer, M. Kerdranvat, E. François, "Information on the TV 3.0 project Call for Proposals from the Brazilian Digital Terrestrial TV Forum", JVET-U0128, 21st Meeting: by teleconference, January 2021.](#)
5. [M. Raulet, T. Biatek, T. Guionnet, B. Bross, P. de Lagrange, R. Schaefer, M. Kerdranvat, E. François, "Updated information on the TV 3.0 project Call for Proposals from the Brazilian Digital Terrestrial TV Forum", JVET-V0167, 22nd Meeting: by teleconference, April 2021.](#)
6. [V. Baroncini, M. Wien, "VVC verification test report for high dynamic range video content", JVET-W2020, 23rd Meeting: by teleconference, July 2021.](#)
7. [P. de Lagrange, F. Urban, E. François, W. Hamidouche, "AHG4: preparation of spatial scalability verification tests", JVET-X0202, 25th Meeting: by teleconference, October 2021.](#)
8. [P. de Lagrange, F. Urban, G. Marquant, "AHG10: study of layer bitrate allocation for spatial scalability in VTM", JVET-Y0048, 25th Meeting: by teleconference, January 2022.](#)