JCT3V-D0166

CE1.h:
On reference view selection in NBDV and VSP

Feng Zou, Dong Tian, Anthony Vetro, Huifang Sun

Mitsubishi Electric Research Labs (MERL)

Cambridge, MA

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Outlines

- Reference view selection for NBDV
- Reference view selection for VSP

Problems with NBDV

- In NBDV process
  - Base view (refViewIdx = 0) is always referenced
- PIP interview test case
  - No problems for any views
- IBP interview test case (or IPP test case)
  - Two potential reference views for the B view (or second P view)
  - DV derived from neighboring block may refer to either reference view
    - refViewIdx = 0
    - refViewIdx = 1
  - Conceptually inconsistent!

Proposed fix on NBDV process

- The reference view returned by NBDV process
  - Set to the actual reference being used
  - The depth fetching process in NBDV is proposed to use the actual reference view

Problems with VSP reference view

- Share the common problem with NBDV process
- In addition, ui-direction prediction is always used for VSP prediction
  - From refPicList0
- PIP interview test case
  - No problems with any views
- I**B**P interview test case (or IP**P** test case)
  - Lack of a way to determine the prediction direction, when uni-prediction is in use
  - Lack of a way to support bi-direction prediction
- **In-complete design and inefficient**
  - **Feature missing**

Proposal on Bi-VSP

- Include the proposed NBDV fix
- Prediction direction determination
  - Based on interview reference availability
- For a P picture
  - Always uni-direction prediction
  - The prediction direction is <u>determined</u> by the <u>actual</u> view associated with the DV returned from NBDV
- For a B picture
  - If only one reference picture list has an interview reference picture, uni-direction used, same as P picture
  - If there are different interview reference pictures from the two lists, bi-VSP prediction is proposed

Simulations – NBDV fix only

- IBP test case
- For B view, 0.2% bitrate saving
- For video PSNR vs. video bitrate, 0.0% bitrate saving
- For synthesis PSNR vs. total bitrate, 0.0% bitrate saving

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time	ren time
Balloons	0.0%	0.0%	0.8%	0.1%	0.1%	0.2%	99.6%	101.6%	104.9%
Kendo	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	101.6%	102.2%	101.1%
Newspaper_CC	0.0%	0.0%	0.5%	0.1%	0.1%	0.1%	101.2%	98.7%	96.4%
GT_Fly	0.0%	0.0%	-2.2%	-0.2%	-0.2%	-0.1%	99.7%	109.9%	113.1%
Poznan_Hall2	0.0%	0.0%	-0.2%	0.0%	0.0%	0.0%	99.8%	108.4%	106.7%
Poznan_Street	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	100.2%	107.5%	138.2%
Undo_Dancer	0.0%	0.0%	-0.5%	0.0%	0.0%	0.0%	101.6%	104.4%	144.5%
1024x768	0.0%	0.0%	0.4%	0.1%	0.1%	0.2%	100.8%	100.8%	100.8%
1920x1088	0.0%	0.0%	-0.7%	-0.1%	-0.1%	0.0%	100.3%	107.5%	125.6%
average	**0.0%**	**0.0%**	**-0.2%**	**0.0%**	**0.0%**	**0.0%**	**100.5%**	**104.6%**	**115.0%**

Simulations – Bi-VSP fixes

- IBP test case
- For B view, 3.1% bitrate saving
- For video PSNR vs. video bitrate, 0.3% bitrate saving
- For synthesis PSNR vs. total bitrate, 0.1% bitrate saving

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time	ren time
Balloons	0.0%	0.0%	0.6%	0.2%	0.2%	0.3%	105.1%	99.6%	99.5%
Kendo	0.0%	0.0%	-0.6%	0.0%	0.1%	0.3%	101.8%	100.9%	98.1%
Newspaper_CC	0.0%	0.0%	0.7%	0.1%	0.1%	0.2%	102.1%	96.2%	95.2%
GT_Fly	0.0%	0.0%	-8.8%	-0.7%	-0.7%	-0.4%	100.0%	115.9%	107.4%
Poznan_Hall2	0.0%	0.0%	-0.7%	-0.1%	-0.1%	0.0%	100.5%	106.0%	99.1%
Poznan_Street	0.0%	0.0%	-3.7%	-0.3%	-0.3%	-0.1%	100.8%	105.7%	119.7%
Undo_Dancer	0.0%	0.0%	-9.0%	-1.0%	-1.0%	-0.6%	100.8%	107.2%	131.8%
1024x768	0.0%	0.0%	0.2%	0.1%	0.1%	0.3%	103.0%	98.9%	97.6%
1920x1088	0.0%	0.0%	-5.5%	-0.5%	-0.5%	-0.3%	100.5%	108.7%	114.5%
average	**0.0%**	**0.0%**	**-3.1%**	**-0.3%**	**-0.2%**	**-0.1%**	**101.6%**	**104.5%**	**107.3%**

Conclusions

- The proposed fixes on NBDV and VSP address problems with test cases like **IB**P and **IPP**

- Make the design correct and complete

- Improved coding performance is validated
  - 3.1% for B view, and 0.1% for overall

- Recommend to adopt the proposed fixes/functionalities into software, and WD

THANKS

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