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| *Title:* | **3D-AVC results on improved inside view motion prediction** | | |
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# Abstract

Modifications on IVMP (Inside View Motion Prediction, M22583) are proposed to improve coding gains. IVMP availability conditions and motion prediction method are changed. Other parts including syntaxes are not changed at all. The proposed algorithms are tested using 3D-ATM version 0.4 with CTC.

# Proposed modifications

## IVMP Availability

For the mixed resolution 3D video cases, the IVMP is enabled when all of the corresponding four texture macroblocks are coded as skip or inter 16x16 or inter 16x8 or inter 8x16. In the proposed modification, IVMP is allowed when at least one corresponding texture macroblock is coded as inter mode including P8x8 mode. Thus, more depth macroblocks have a chance to be encoded as IVMP. For the intra coded texture macroblock, motion information of inter coded neighboring macroblock is used.

## Motion Prediction

For the mixed resolution 3D video cases, the four texture macroblocks are corresponds to one depth macroblock. In IVMP, motion information of the one texture macroblock is mapped to 8x8 sub-block of one depth macroblock as shown in Fig. 1.

**Fig.1. Macroblock correspondence of texture and depth for mixed resolution 3D video**

The motion prediction of 8x8 sub-block is determined by mb\_type of corresponding texture macroblock. For example, the motion prediction unit of A’ is 8x4 block if mb\_type of A is P16x8. However, depth does not need to accurate motion vector as much as texture. Thus, the proposed motion prediction uses 8x8 block size regardless of mb\_type of corresponding texture. Instead, process that finds the reliable motion vector is added. In H.264/AVC can have up to other 16 motion vectors for a macroblock. The motion information of the 4x4 block that has motion vector of maximum magnitude is selected for motion prediction.

# Coding experiments

Results of the coding experiment using a 3D-ATM version 0.4 including the proposed modifications for the three view case are given in . It can be seen that run time is almost same with anchor and a rate reduction of 0.2% for the synthesized views can be achieved. Additional results can be found in the attached excel sheet.

Table : coding results for proposed modifications

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Total (Coded PSNR) | | Total (Synthesized PSNR) | | Complexity estimate (ratio to anchor) | |
|  | dBR, % | dPSNR, dB | dBR, % | dPSNR, dB | Encoder Time, % | Decoder Time, % |
| PoznanHall2 | -0.27 | 0.01 | -0.18 | 0.00 | 99.97 | 100.71 |
| PoznanStreet | -0.14 | 0.00 | -0.14 | 0.00 | 98.23 | 100.95 |
| UndoDancer | -0.15 | 0.01 | -0.27 | 0.01 | 99.64 | 98.61 |
| GhostTownFly | -0.12 | 0.00 | -0.10 | 0.00 | 99.82 | 100.23 |
| Kendo | -0.14 | 0.01 | -0.28 | 0.01 | 99.47 | 101.36 |
| Balloons | -0.18 | 0.01 | -0.16 | 0.01 | 99.31 | 99.63 |
| Newspaper | -0.07 | 0.00 | -0.07 | 0.00 | 100.34 | 97.95 |
| Average | -0.15 | 0.01 | -0.17 | 0.01 | 99.54 | 99.92 |

Table : coding results for IVMP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total (Coded PSNR) | | Total (Synthesized PSNR) | |
|  | dBR, % | dPSNR, dB | dBR, % | dPSNR, dB |
| PoznanHall2 | -0.06 | 0.00 | -0.25 | 0.01 |
| PoznanStreet | -0.38 | 0.01 | -0.44 | 0.01 |
| UndoDancer | -0.27 | 0.01 | -0.35 | 0.01 |
| GhostTownFly | -0.34 | 0.01 | -0.68 | 0.02 |
| Kendo | -0.23 | 0.01 | -0.35 | 0.01 |
| Balloons | -0.23 | 0.01 | -0.44 | 0.02 |
| Newspaper | -0.32 | 0.01 | -0.49 | 0.02 |
| Average | -0.26 | 0.01 | -0.43 | 0.02 |

# Conclusion

Modifications on IVMP have been suggested. Coding results for these modifications have been presented. It achieves 0.2% coding gain without run time increase. The improvement is almost half gain of IVMP.

# Patent right declaration(s)

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