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| **Joint Collaborative Team on 3D Video Coding Extensions**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  7th Meeting: San José, US, 11–17 Jan. 2014 | Document: JCT3V-G0036 |

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| *Title:* | **Simplified VSP subblock decision** | | |
| *Status:* | Input Document to JCT-3V | | |
| *Purpose:* | Proposal | | |
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# Abstract

This proposal presents a simplified VSP subblock decision. Currently subblock size of VSP is decided based on depth values except of AMP PU. This contribution proposes to further simplify the decision so that depth base decision is applied only to square PUs. With this simplification, the depth access in VSP subbock decision is the same as the DoNBDV depth access since the access point is completely the same (no additional, no less). The experiment result shows that the BD-rate gain is 0.0 %, 0.0 % and 0.0 % in video, total video and synthesis respectively.

# Introduction

Currently VSP subblock is decided based on depth value in case that both width and height is proportional to 8 as Figure 1 shows.



Fig. 1 Depth base subblock decision (HTM9)

# Proposal

In this proposal, if PU width and PU height is the same (2Nx2N or NxN), the sub block size is derived from depth values. Otherwise the sub block size is derived from the comparison of PU width and PU height.



Fig. 1 Simplified subblock decision (proposal)

# Proposed Text

The variables nSubBlkW and nSubBlkH are set equal to nPSW and nPSH, respectively.

When splitFlag is equal to 1, nSubBlkW, nSubBlkH are modified as specified in the following:

* ~~The variable minSubBlkSizeFlag is derived as specified in the following:~~ 
  + - 1. ~~minSubBlkSizeFlag = ( nPSW % 8 != 0) | | ( nPSH % 8  != 0 ) (‑290)~~
* ~~Depending on the value of minSubBlkSizeFlag, the following applies.~~ 
  + ~~If minSubBlkSizeFlag is equal to 1, the following applies:~~ 
    - 1. ~~horSplitFlag = ( nPSH % 8 ! = 0 ) (‑291)~~
  + If nPSW is larger than nPSH
    - 1. horSplitFlag = 1 (‑290)
  + Otherwise (nPSW is equal to or less than nPSH), if nPSH is larger than nPSW
    - 1. horSplitFlag = 0 (‑291)
  + Otherwise (nPSW is equal to nPSH ~~minSubBlkSizeFlag is equal to 0~~), the following applies:
    - 1. xP0 = Clip3( 0, pic\_width\_in\_luma\_samples – 1, xTL ) (H‑292)
      2. yP0 = Clip3( 0, pic\_height\_in\_luma\_samples – 1, yTL ) (H‑293)
      3. xP1 = Clip3( 0, pic\_width\_in\_luma\_samples – 1, xTL + nPSW – 1 ) (H‑294)
      4. yP1 = Clip3( 0, pic\_height\_in\_luma\_samples – 1, yTL + nPSH – 1 ) (H‑295)
      5. horSplitFlag = ( refDepPels[ xP0 ][ yP0 ] < refDepPels[ xP1 ][ yP1 ] )  
          = = ( refDepPels[ xP1 ][ yP0 ] < refDepPels[ xP0 ][ yP1] ) ) (‑296)

# Simulation results

Experiment result based on HTM90r1 is shown in Table 1.

Table 1 Experimental results (anchor: HTM90r1)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 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% | -0.2% | 0.0% | -0.01% | -0.01% | -0.02% | 100.0% | 98.5% | 99.9% |
| Kendo | 0.0% | -0.1% | 0.0% | -0.03% | -0.03% | -0.11% | 97.6% | 100.8% | 99.7% |
| Newspaper\_CC | 0.0% | 0.0% | 0.0% | 0.01% | 0.01% | 0.07% | 97.8% | 98.6% | 99.5% |
| GT\_Fly | 0.0% | -0.1% | -0.1% | -0.02% | -0.02% | -0.01% | 99.2% | 100.9% | 100.2% |
| Poznan\_Hall2 | 0.0% | 0.1% | -0.1% | 0.00% | 0.01% | 0.05% | 99.9% | 99.9% | 100.0% |
| Poznan\_Street | 0.0% | -0.1% | -0.2% | -0.03% | -0.02% | -0.02% | 100.3% | 98.6% | 99.0% |
| Undo\_Dancer | 0.0% | -0.1% | -0.1% | -0.01% | -0.01% | -0.01% | 99.9% | 99.9% | 99.5% |
| Shark | 0.0% | -0.1% | -0.1% | -0.01% | -0.01% | 0.02% | 99.4% | 99.3% | 100.6% |
| 1024x768 | 0.0% | -0.1% | 0.0% | -0.01% | -0.01% | -0.02% | 98.5% | 99.3% | 99.7% |
| 1920x1088 | 0.0% | 0.0% | -0.1% | -0.01% | -0.01% | 0.01% | 99.7% | 99.7% | 99.9% |
| **average** | **0.0%** | **-0.1%** | **-0.1%** | **-0.01%** | **-0.01%** | **0.00%** | **99.3%** | **99.6%** | **99.8%** |

# Conclusion

This contribution proposes simplification of VSP subblock decision. It is recommended to adopt this method in 3D-HEVC.

# Patent rights declaration(s)

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