JCT3V-E0093

3D-CE3.h: Results on simple merge candidate list construction for 3DV

(Cross-checked by JCT3V-F0245)

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❖ **We believe that it is essential for 3DV to provide reusability way to enable making benefits from existing and already deployed technology and allow the 3DV standard to be delivered to meet the market demand.**

❖ **The 3D-HEVC module**

◆ **Some tools are integrated without considering H/W implementation comparability and constraints on the existing HEVC module.**

✓ **e.g. MCL module for enhancement views**

Proposed MCL design

❖ **MCL process follows HM design for enhancement views**

❖ **Simplification**

   ◆ **Pruning process for insertion cases of texture candidate, temporal inter-view candidate and disparity inter-view candidate**

   ◆ **Combined bi-predictive candidate derivation**

Pros. vs. Cons. of Proposed MCL design

❖ **Benefits**

  ◆ **Reusability are increased**

  ◆ **WD text are simplified**

  ◆ **Easy implementation is realized in H/W and S/W aspect**
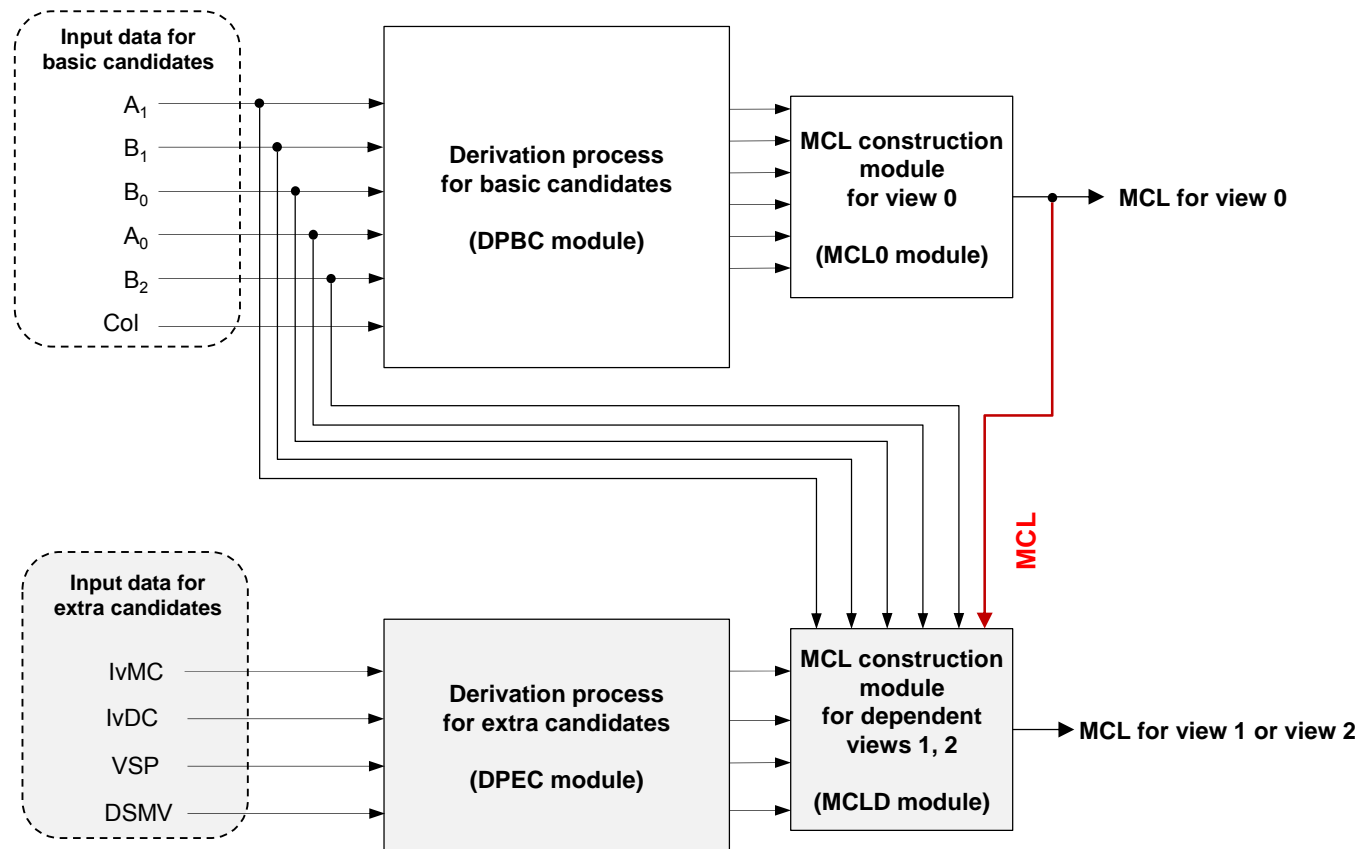
❖ **Modification**

  ◆ **Provide 2-Step Early termination**

  ✓ **Impact in S/W implementation (But, worst case is same as proposed design)**

Conclusion

- **Current Ref. SW is designed for single-core processors.**

- **It is not designed for both HW implementation and software codecs**

- **HW implementation usually uses the parallel processing design**

- **SW implementation also uses parallel processing design for multi-core processers and GPUs, even in Hand-held devices such as smart phones**

- **Early termination is not used in both HW design and SW design that uses multi-core processors.**

- **The proposed method can be implemented as 2 step early termination, and additional number of derivation is negligible. However the advantage of early termination is very limited, even reasonably very small for computational complexity reduction.**

❖ Following the original design of HM

◆ Minimized complexity of HW/SW implementation

Proposed

- ❖ **Clarification: HM design**
- ❖ **Simplification:**
  - ◆ **Redundancy check(Pruning)**
  - ◆ **Combined bi-predictive candidate derivation**

	Complexity			Coding results		
	Additional operations	Additional memory access	Etc.	Video only	Video / total BR	Synthesized / total BR
E0213 vs. HTM 7.0	• **6 redundancy check** • Less calculations on virtual candidates generation (20→12)	No additional memory access	• Early-termination is not allowed	0.1%	0.1%	0.1%
F0093 vs. HTM 8.0	• **0 redundancy check** • Less calculations on virtual candidates generation (20→12)	No additional memory access	• Provide 2-step early-termination (early-termination is implementation issue)	0.0%	0.0%	0.0%

❖ **No need to check BVSP flags on spatial candidates**

❖ **Reduced # of combination (20 → 12)**

combIdx	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
L0Cand Idx	0	1	0	2	1	2	0	3	1	3	2	3	0	4	1	4	2	4	3	4
L1Cand Idx	1	0	2	0	2	1	3	0	3	1	3	2	4	0	4	1	4	2	4	3

Combination table of the HTM 8.0