



哈爾濱工業大學
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Non-CE9 : Motion information derivation of deformable block

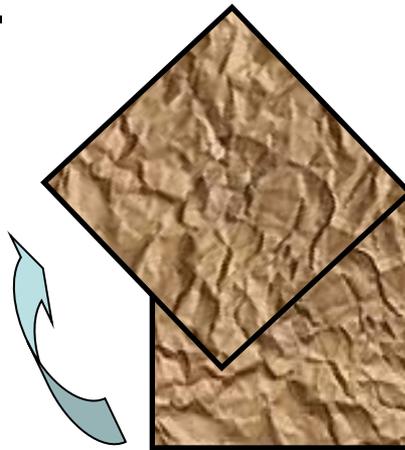
JCTVC-H0655

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Motion Estimation Model in HM4.0

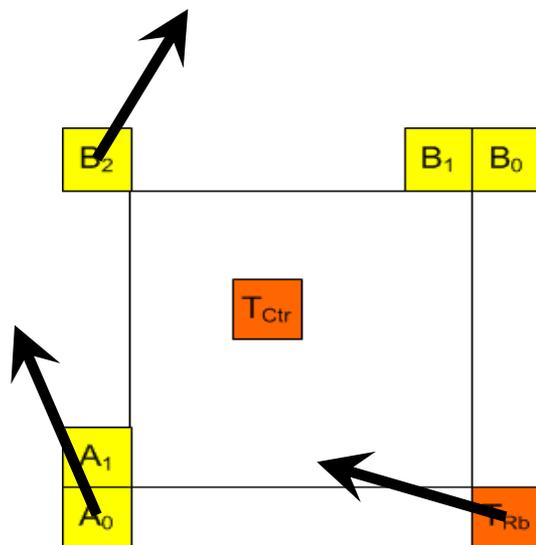
Motivation

- ◆ Block matching motion estimation (BMME)
- ◆ Not efficient for non-translation motion, i.e., rotation, zoom, and etc.



Proposed Method

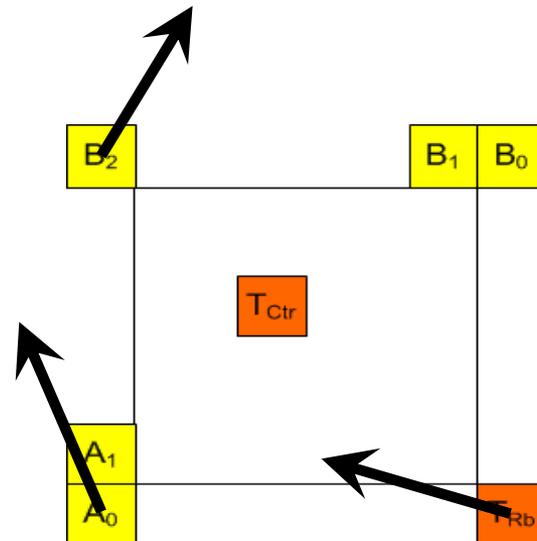
- ◆ Candidate positions of merge mode in HM4.0



- ◆ Motion vector interpolation from corners

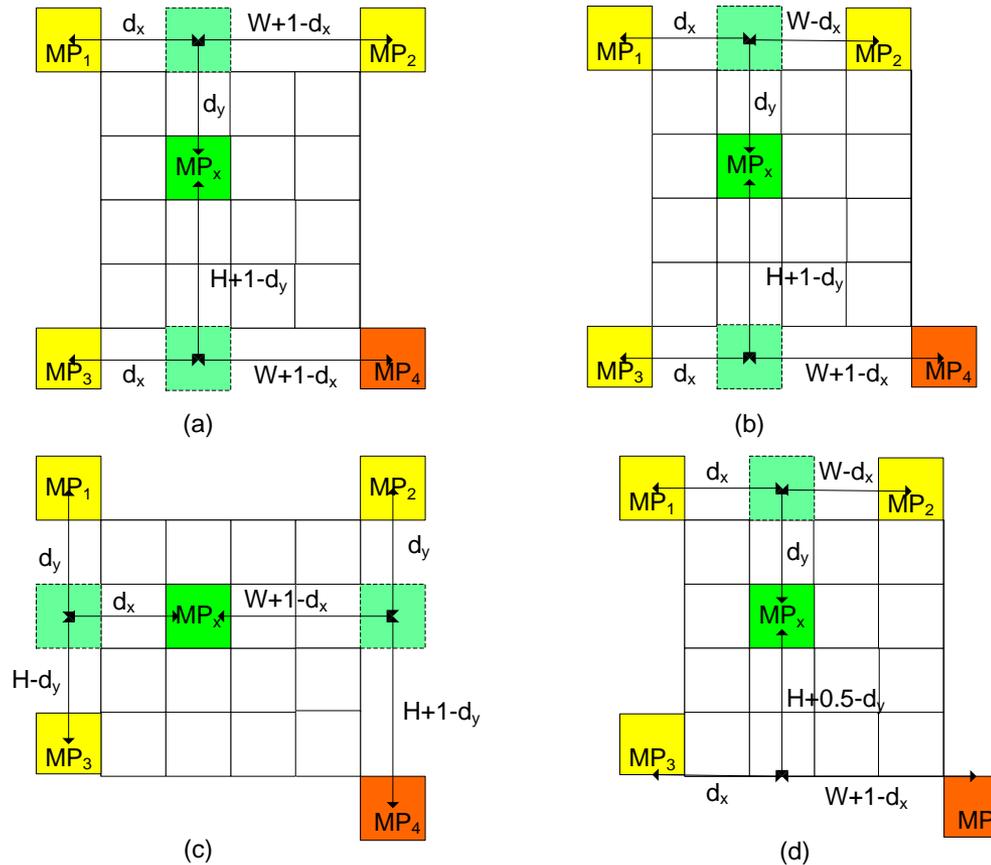
Proposed Method

- ◆ Motion information of each corner can be derived and not identical
 - For above right corner, first check B_1 , then check B_0
 - For below left corner, first check A_1 , then check A_0



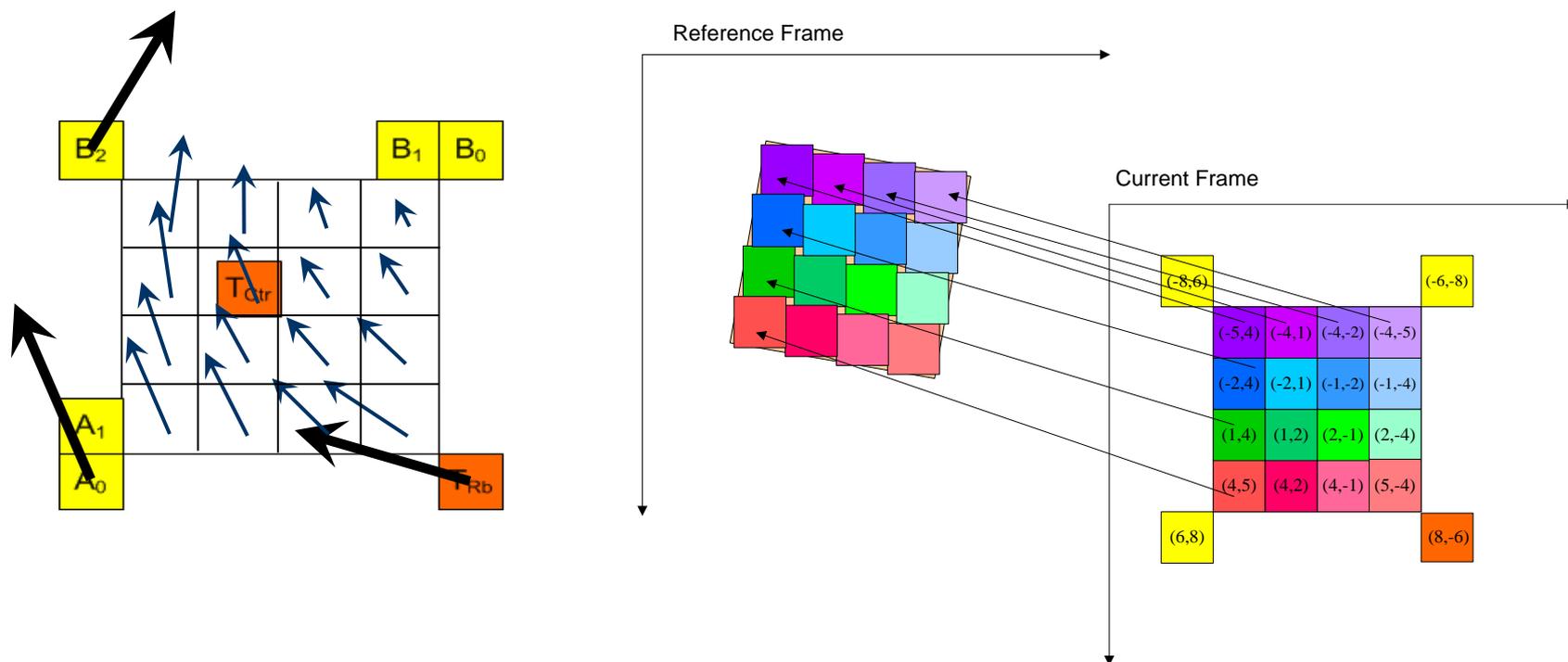
Proposed Method

◆ Motion interpolation for each 4x4 block in a PU



Proposed Method

- ◆ Motion interpolation for each 4x4 block in a PU



Proposed Method

- ◆ RDO-based decision on whether to use the proposed method, one additional flag
 - If used, the additional flag signaled, and no merge index transmitted (proposed)
 - Otherwise, the additional flag signaled, and merge index transmitted (original merge mode)

- ◆ Only applied to CU using merge mode with size larger than 16×16 and the $SIZE_2N \times 2N$.

Experimental Results

Sequence	Resolution	Number of frames
Cactus	1920x1080	300
BlueSky	1920x1080	200
Station	1920x1080	100
Tractor	1920x1080	240
Vidyo3	1280x720	200
Shields	1280x720	100
Flowervase	416x240	300
BasketballDrive	1920x1080	300
BQMall	832x480	300
BasketballPass	416x240	300

Experimental Results

Sequence	Random Access HE			Low delay B HE			Low delay P HE		
	Y	U	V	Y	U	V	Y	U	V
Cactus_1920x1080	-1.0%	-0.8%	-0.9%	-0.9%	-0.7%	-0.3%	-0.6%	-0.8%	-0.9%
BlueSky_1920x1080	-1.1%	-0.8%	-0.9%	-1.8%	-1.3%	-1.2%	-1.2%	-1.2%	-1.0%
Station_1920x1080	-5.3%	-4.2%	-4.4%	-12.2%	-8.3%	-8.6%	-12.1%	-9.5%	-9.8%
Tractor_1920x1080	-2.2%	-1.2%	-1.2%	-4.7%	-3.3%	-3.3%	-4.5%	-4.0%	-3.7%
Vidyo3_1280x720				-1.1%	-0.2%	-0.7%	-0.6%	-1.3%	-0.4%
Shields_1280x720	-2.1%	-1.7%	-1.8%	-4.7%	-3.2%	-2.7%	-3.6%	-3.0%	-2.5%
Flowervase_416x240	-0.7%	-0.4%	-0.3%	-1.2%	-1.3%	-1.3%	-0.6%	1.2%	-0.1%
BasketballDrive_1920x1080	0.0%	-0.2%	0.0%	-0.1%	-0.3%	-0.1%	-0.2%	-0.1%	-0.1%
BQMall_832x480	0.1%	-0.2%	-0.4%	0.0%	-0.3%	0.5%	-0.1%	-0.6%	-0.2%
BasketballPass_416x240	0.0%	0.1%	-0.3%	-0.1%	-0.5%	0.0%	0.0%	-0.7%	0.2%
Enc Time[%]		100%			100%			101%	
Dec Time[%]		103%			102%			102%	

Conclusion

- ◆ Significant coding gain compared to HM4.0 anchor for sequences with complex motion
- ◆ No performance loss for the rest of test sequences
- ◆ The encoding almost identical, decoding time slightly increased

Thank you!