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Simplification of MV Derivation for Affine Chroma

JVET-Q0324

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Overview

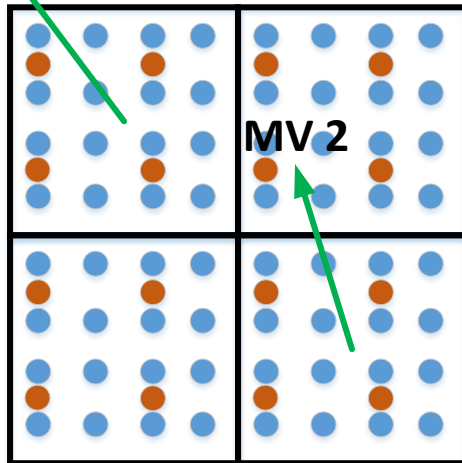
- This contribution proposes to simplify the MV derivation process for chroma sub-block of an affine CU by **removing the average process**.
- The proposed methods show marginal coding performance change on VTM-7.0 anchor.



Overview

□ Current design

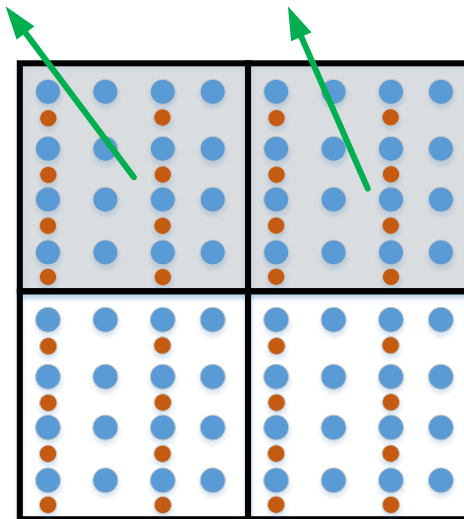
MV 1



(a) 4:2:0 format

MV 1

MV 2



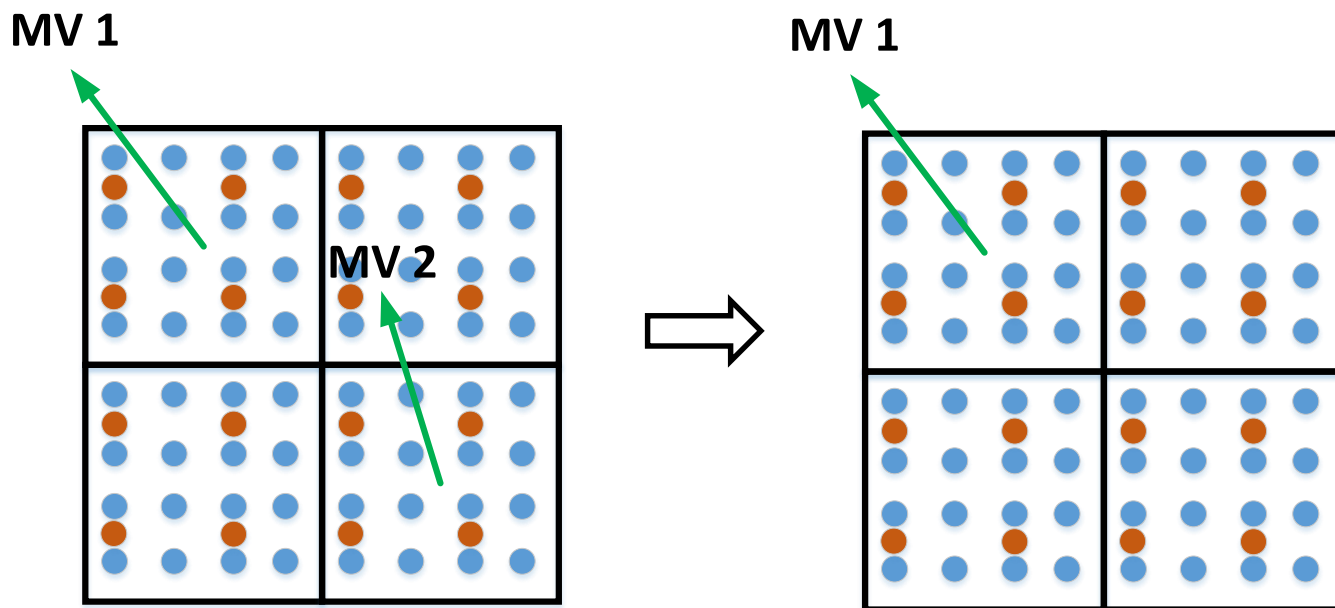
(b) 4:2:2 format

- Luma pixel
- Chroma pixel

Proposed method

- In this contribution, average process is proposed to be removed from MV derivation process for affine chroma.

- 4:2:0 format



Proposed method

□ Experimental results

■ 4:2:0 format

	Random access Main10				
	Over VTM-7.0				
	Y	U	V	EncT	DecT
Class A1	0.01%	-0.07%	0.14%	113%	100%
Class A2	0.13%	0.80%	0.56%	105%	96%
Class B	0.02%	0.18%	0.24%	104%	89%
Class C	0.03%	0.13%	0.10%	97%	84%
Class E					
Overall	0.04%	0.24%	0.25%	104%	91%
Class D	0.00%	0.29%	0.24%	84%	69%
Class F	0.04%	0.45%	0.42%	98%	83%

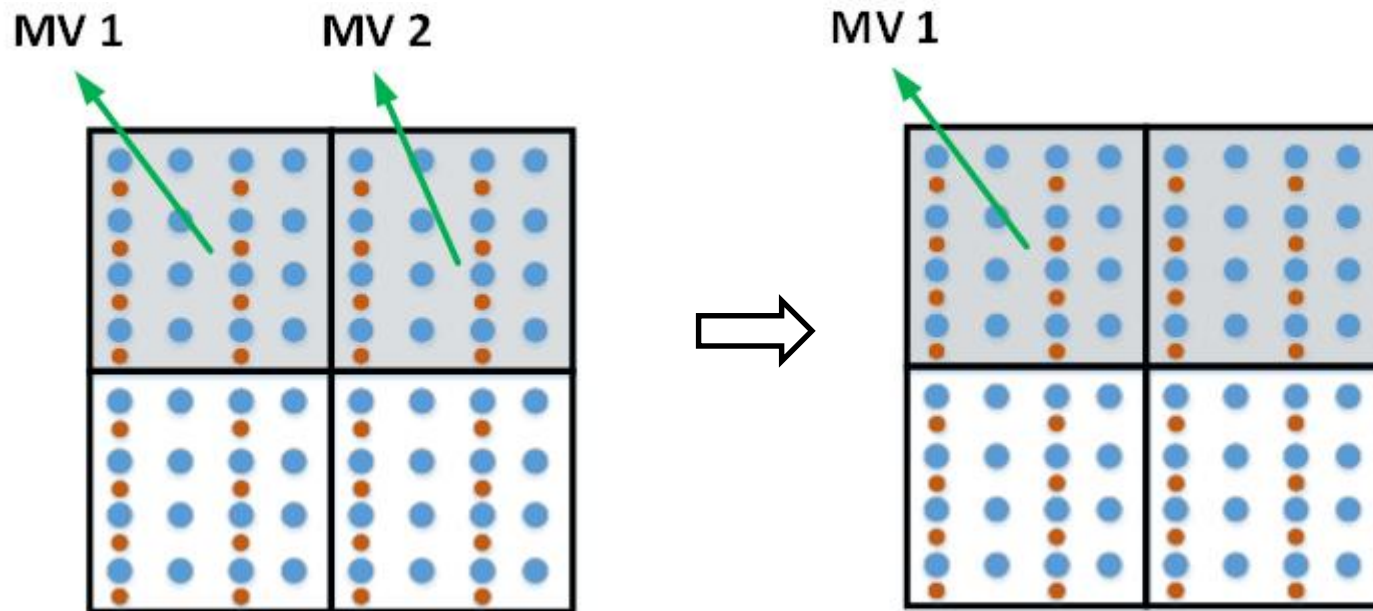
	Low delay B Main10				
	Over VTM-7.0				
	Y	U	V	EncT	DecT
Class B	0.02%	-0.08%	0.05%	120%	99%
Class C	-0.02%	-0.03%	-0.01%	119%	103%
Class E	0.03%	0.22%	0.11%	115%	91%
Overall	0.01%	0.01%	0.04%	119%	98%
Class D	0.04%	0.68%	1.03%	125%	128%
Class F	0.06%	0.13%	1.11%	119%	99%



Proposed method

- In this contribution, average process is proposed to be removed from MV derivation process for affine chroma.

- 4:2:2 format



Proposed method

□ Experimental results

■ 4:2:2 format

	Random Access				
	Over VTM-7.0			EncR	DecR
	Y	U	V		
Traffic	0.01%	-0.06%	-0.07%	100%	102%
Kimono	-0.04%	0.00%	0.06%	100%	95%
Seeking	0.01%	0.00%	0.04%	99%	97%
EBUHorse	0.00%	0.07%	-0.01%	100%	94%
EBUGraphics	0.00%	0.02%	0.04%	99%	98%
EBUWaterRocksClose	0.01%	-0.06%	0.00%	79%	85%
EBUKidsSoccer	-0.01%	-0.10%	-0.13%	90%	91%
Overall	0.00%	-0.02%	-0.01%	95%	95%

	Low delay B				
	Over VTM-7.0			EncR	DecR
	Y	U	V		
Traffic	0.02%	0.08%	0.11%	102%	118%
Kimono	0.05%	0.21%	0.32%	92%	88%
Seeking	0.01%	0.01%	-0.24%	101%	104%
EBUHorse	-0.09%	0.02%	-0.17%	97%	99%
EBUGraphics	-0.04%	0.03%	-0.08%	97%	89%
EBUWaterRocksClose	0.04%	-0.05%	-0.01%	97%	100%
EBUKidsSoccer	-0.10%	-0.83%	-0.14%	119%	115%
Overall	-0.02%	-0.07%	-0.03%	101%	102%



Conclusion

- ❑ This proposal suggests remove average process to simplify the MV derivation process for chroma sub-block of an affine CU.
- ❑ It is recommended to adopt it to the next VVC working draft.
- ❑ Many thanks Tencent for cross-checking!

