



CREATING THE LIVING NETWORK™

JVET-00577

Non-CE9: Bi-directional Optical Flow
(BDOLF) for Chroma Components

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Introduction

- The bi-directional optical flow (BDOF) tool is included in VTM-5.
 - Refine the bi-prediction signal of a bi-prediction inter CU at the 4×4 sub-block level.
 - Only applied to luma component.

Proposal

- Extend the BD OF to chroma at 4×4 sub-block level as well.
 - Reduced complexity: refined delta motion already computed for luma is reused for chroma.
 - The motion refinement values are halved before applying to chroma.
 - 8x8 sub-block in luma corresponds to 4x4 sub-block in chroma: there are four pairs of motion refinement values for one 4x4 sub-block in chroma.
 - Excludes 4xN CU
 - 4xN sub-block in luma corresponds to 2x(N/2) sub-block in chroma

Simulations

- Applying BDOF on both luma and chroma components

	Random Access Main10				
	Over VTM-5.0				
	Y	U	V	EncT	DecT
Class A1	-0.02%	-0.31%	-0.43%	101%	101%
Class A2	-0.08%	-0.61%	-0.77%	101%	101%
Class B	0.01%	-0.34%	-0.41%	101%	102%
Class C	-0.02%	-0.33%	-0.44%	101%	101%
Class E	-	-	-	-	-
Overall	-0.02%	-0.39%	-0.49%	101%	101%
Class D	0.00%	-0.49%	-0.52%	100%	99%
Class F	0.00%	-0.15%	-0.16%	101%	100%

Summary

- Propose to extend the BD OF to chroma as well
 - Align the operation on both luma and chroma components
 - Better performance: RA-YUV BD-rate saving: -0.02%/-0.39%/-0.49% (over VTM-5.0)

Thank Bytedance for cross-checking !
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