

The background is a solid green color with a repeating pattern of white line-art icons. These icons include various nautical items like anchors, lifebuoys, and seashells, as well as outdoor and travel-related items like a compass, a map, a camera, and a bird in flight.

MEDIATEK

JVET-N0074

CE1-5.5: Simplification of local illumination compensation

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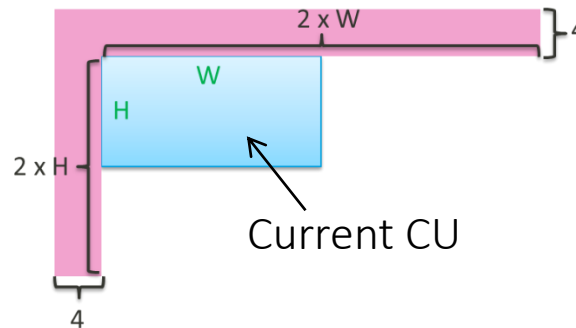
Overall Summary

- Proposed to simplify LIC based on CE1-5.3
 - Normative changes:
 - BiCW is disallowed when LIC is on
 - LIC fast encoding:
 - Reusing the LIC-off motion search results for testing LIC-on
 - Conditionally performing MR-SAD motion search for LIC-on when the LIC usage ratio of neighbouring 4×4 subblocks is larger than or equal to a threshold
 - When performing MR-SAD motion search for LIC-on, if the current best mode of the current CU is uni-prediction, then bi-prediction motion search is skipped
- Experimental results

Over VTM4.0	RA					LB				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
CE1-5.5a	-0.42%	-0.16%	-0.11%	108%	101%	-0.50%	-0.11%	-0.42%	108%	101%
CE1-5.5b	-0.30%	-0.29%	-0.24%	109%	102%	-0.45%	-0.19%	-0.48%	110%	102%
LIC fast encoding based on CE1-5.1a	-0.35%	-0.09%	-0.09%	106%	103%	-0.36%	-0.06%	-0.55%	106%	100%
LIC fast encoding based on CE1-5.1b	-0.24%	-0.15%	-0.15%	106%	101%	-0.31%	-0.15%	-0.13%	106%	100%

LIC Fast Algorithm

- The motion search results of LIC-off is reused to test LIC-on
- If the LIC usage ratio of neighbouring 4x4 subblocks $\geq TH$, then the MR-SAD motion search with LIC-on is further tested
 - Assuming the current CU size is $W \times H$, the number of neighbouring 4x4 subblocks inside the region marked in red is n , and LIC is applied to m out of n subblocks
 - If $m/n \geq TH$, then MR-SAD motion search with LIC-on is further tested
 - TH is set to 0.20 in CE1-5.5a and CE1-5.5b



- When testing MR-SAD motion search with LIC-on, if the current best mode of the current CU is uni-prediction, then bi-prediction motion search is skipped (i.e., only perform uni-prediction motion search)

Detailed Results

CE1-5.5a

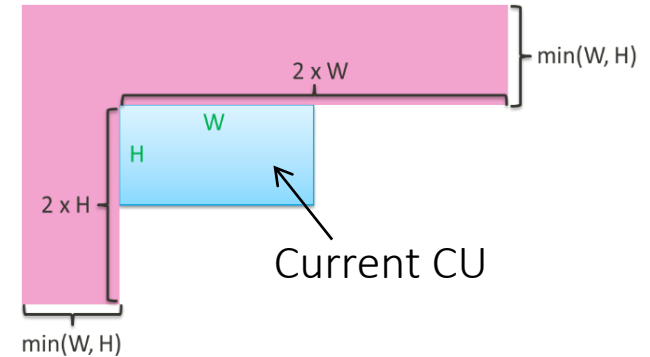
CE1-5.5b

	Random access Main10					Random access Main10				
	Over VTM-4.0					Over VTM-4.0				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class A1	-0.69%	0.04%	0.09%	110%	101%	-0.52%	-0.36%	-0.39%	110%	100%
Class A2	-0.32%	-0.18%	-0.29%	108%	100%	-0.20%	-0.27%	-0.26%	108%	105%
Class B	-0.47%	-0.19%	0.00%	108%	102%	-0.32%	-0.17%	-0.09%	109%	101%
Class C	-0.24%	-0.26%	-0.26%	108%	101%	-0.18%	-0.39%	-0.29%	109%	101%
Overall	-0.42%	-0.16%	-0.11%	108%	101%	-0.30%	-0.29%	-0.24%	109%	102%
Class D	0.00%	0.00%	-0.10%	109%	101%	-0.01%	-0.06%	-0.02%	110%	102%
Class F	-1.07%	-0.56%	-0.70%	105%	100%	-0.84%	-0.55%	-0.64%	106%	100%

	Low delay B Main10					Low delay B Main10				
	Over VTM-4.0					Over VTM-4.0				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class B	-0.68%	-0.49%	-0.22%	109%	102%	-0.61%	-0.43%	-0.59%	110%	103%
Class C	-0.48%	-0.15%	-0.77%	110%	101%	-0.42%	-0.09%	-0.36%	111%	104%
Class E	-0.24%	0.57%	-0.28%	106%	98%	-0.21%	0.05%	-0.46%	107%	99%
Overall	-0.50%	-0.11%	-0.42%	108%	101%	-0.45%	-0.19%	-0.48%	110%	102%
Class D	-0.03%	-0.12%	-0.85%	109%	103%	-0.02%	-0.36%	-1.16%	110%	103%
Class F	-3.16%	-2.65%	-2.86%	109%	101%	-2.89%	-2.34%	-3.29%	109%	101%

LIC Fast Algorithm Based on CE1-5.1

- LIC fast encoding configuration:
 - Extent the region of neighboring 4x4 subblocks
 - TH is set to 0.10



LIC fast encoding based on CE1-5.1a

	Random access Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1	-0.50%	0.28%	0.39%	107%	104%
Class A2	-0.31%	-0.26%	-0.32%	105%	104%
Class B	-0.36%	-0.13%	-0.08%	105%	104%
Class C	-0.23%	-0.18%	-0.29%	105%	100%
Overall	-0.35%	-0.09%	-0.09%	106%	103%
Class D	-0.05%	-0.06%	-0.09%	105%	100%
Class F	-0.83%	-0.47%	-0.48%	104%	102%

LIC fast encoding based on CE1-5.1b

	Random access Main10				
	Over VTM-4.0				
	Y	U	V	EncT	DecT
Class A1	-0.37%	-0.09%	-0.08%	108%	101%
Class A2	-0.21%	-0.18%	-0.23%	105%	101%
Class B	-0.23%	-0.12%	-0.11%	106%	100%
Class C	-0.16%	-0.21%	-0.20%	106%	101%
Overall	-0.24%	-0.15%	-0.15%	106%	101%
Class D	-0.04%	-0.02%	-0.05%	106%	101%
Class F	-0.68%	-0.39%	-0.48%	105%	100%

	Low delay B Main10					Low delay B Main10				
	Over VTM-4.0					Over VTM-4.0				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class B	-0.52%	-0.16%	-0.36%	105%	101%	-0.41%	-0.24%	-0.09%	106%	100%
Class C	-0.34%	0.03%	-0.36%	106%	101%	-0.30%	-0.16%	-0.04%	107%	101%
Class E	-0.12%	-0.01%	-1.11%	105%	99%	-0.16%	0.01%	-0.33%	105%	97%
Overall	-0.36%	-0.06%	-0.55%	106%	100%	-0.31%	-0.15%	-0.13%	106%	100%
Class D	0.00%	-0.24%	-0.28%	106%	103%	-0.06%	-0.32%	-0.68%	107%	102%
Class F	-2.65%	-2.07%	-2.33%	106%	99%	-2.33%	-1.84%	-2.59%	107%	101%

Summary

- This contribution proposes to simplify LIC
- The encoding time and latency issues for LIC are mitigated
- Suggest to be adopted in VTM