

REDEFINING MOBILITY



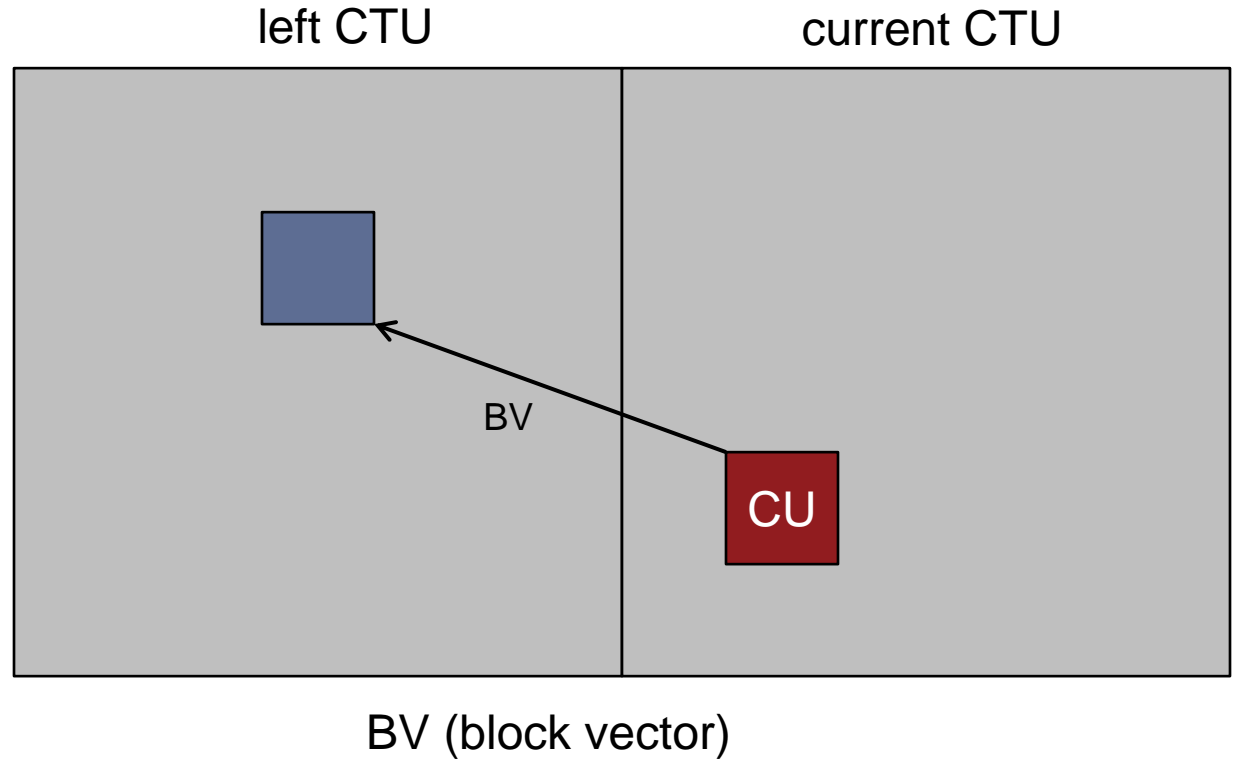
Fast Encoder Search for NxN PU Intra BC

JCTVC-P0151

Chao Pang, Joel Sole, Rajan Joshi, Marta Karczewicz

Introduction

- Intra block copy (Intra BC)



- In RCE3 Subtest B.3, Intra BC is extended to NxN PU for the smallest CU.

Proposed

■ Fast Encoder Search Method

- During the BV search for the CU of size 8×8 , the SADs of the 4 4×4 blocks are reused for the BV search for $N \times N$ PU;
- The Intra BC $N \times N$ mode is not checked if
 1. $intra_cost < \max(48, 32 \times \Lambda)$
 2. $bUse1DSearchFor8x8 = true$
 3. The BVs of the 4 4×4 blocks obtained from the BV search for the CU of size 8×8 are the same;

Proposed vs The anchor (lossy)

	All Intra Main-tier			All Intra High-tier			All Intra Super-High-tier		
	Y	U	V	Y	U	V	Y	U	V
Class F	-2.8%	-2.7%	-2.7%	-2.8%	-2.7%	-2.7%	-2.7%	-2.6%	-2.6%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB 4:4:4 SC	-7.3%	-7.2%	-7.2%	-8.0%	-7.8%	-7.8%	-8.3%	-8.1%	-8.1%
RGB 4:4:4 Animation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YCbCr 4:4:4 SC	-6.8%	-6.7%	-6.5%	-7.7%	-7.6%	-7.3%	-8.1%	-7.9%	-7.8%
YCbCr 4:4:4 Animation	0.0%	0.0%	-0.1%	0.0%	0.0%	-0.1%	0.0%	0.0%	-0.1%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB 4:4:4 SC (Optional)	-8.4%	-8.0%	-8.0%	-9.4%	-9.0%	-9.0%	-10.2%	-9.7%	-9.7%
YCbCr 4:4:4 SC (Optional)	-9.7%	-9.6%	-9.5%	-11.9%	-11.6%	-11.5%	-13.9%	-13.3%	-13.5%
Enc Time[%]	109%			108%			108%		
Dec Time[%]	103%			103%			102%		

	Random Access Main-tier			Random Access High-tier		
	Y	U	V	Y	U	V
Class F	-2.0%	-2.2%	-2.1%	-2.0%	-2.1%	-2.1%
Class B	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
RGB 4:4:4 SC	-6.3%	-6.0%	-6.1%	-6.7%	-6.4%	-6.4%
RGB 4:4:4 Animation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV 4:4:4 SC	-5.7%	-5.6%	-5.7%	-6.5%	-6.3%	-6.4%
YUV 4:4:4 Animation	0.0%	-0.1%	-0.1%	0.0%	0.0%	0.0%
RangeExt	0.0%	0.1%	0.0%	0.0%	0.0%	-0.1%
RGB 444 SC (Optional)	-6.5%	-6.1%	-6.2%	-7.6%	-7.0%	-7.2%
YUV 444 SC (Optional)	-8.4%	-8.2%	-8.4%	-10.2%	-9.9%	-10.1%
Enc Time[%]	100%			100%		
Dec Time[%]	99%			99%		

	Low delay B Main-tier			Low delay B High-tier		
	Y	U	V	Y	U	V
Class F	-0.9%	-1.4%	-0.8%	-1.1%	-1.1%	-1.1%
Class B	0.0%	0.2%	0.1%	0.0%	0.1%	0.0%
RGB 4:4:4 SC	-4.2%	-4.0%	-4.0%	-5.0%	-4.6%	-4.6%
RGB 4:4:4 Animation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV 4:4:4 SC	-3.7%	-3.6%	-3.6%	-4.5%	-4.2%	-4.3%
YUV 4:4:4 Animation	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%
RangeExt	0.0%	0.1%	0.0%	0.0%	-0.1%	0.0%
RGB 444 SC (Optional)	-5.1%	-4.8%	-5.1%	-6.7%	-6.0%	-6.4%
YUV 444 SC (Optional)	-7.0%	-6.7%	-6.7%	-9.0%	-8.8%	-8.7%
Enc Time[%]	100%			100%		
Dec Time[%]	99%			99%		

Proposed vs The anchor (lossless)

	AI	RA	LB
Class F	-1.2%	-0.6%	-0.2%
Class B	0.0%	0.0%	0.0%
RGB 4:4:4 SC	-5.3%	-4.4%	-4.1%
RGB 4:4:4 Animation	0.0%	0.0%	0.0%
YCbCr 4:4:4 SC	-5.6%	-4.5%	-4.3%
YCbCr 4:4:4 Animation	0.0%	0.0%	0.0%
RangeExt	0.0%	0.0%	0.0%
RGB 4:4:4 SC (Optional)	-8.6%	-7.2%	-7.2%
YCbCr 4:4:4 SC (Optional)	-10.9%	-10.0%	-11.1%
Enc Time[%]	115%	102%	103%
Dec Time[%]	99%	99%	99%

Conclusions

- Several fast encoder search tools are proposed for NxN PU Intra BC.