Block Vector Predictor Initialization for Intra Block Copy
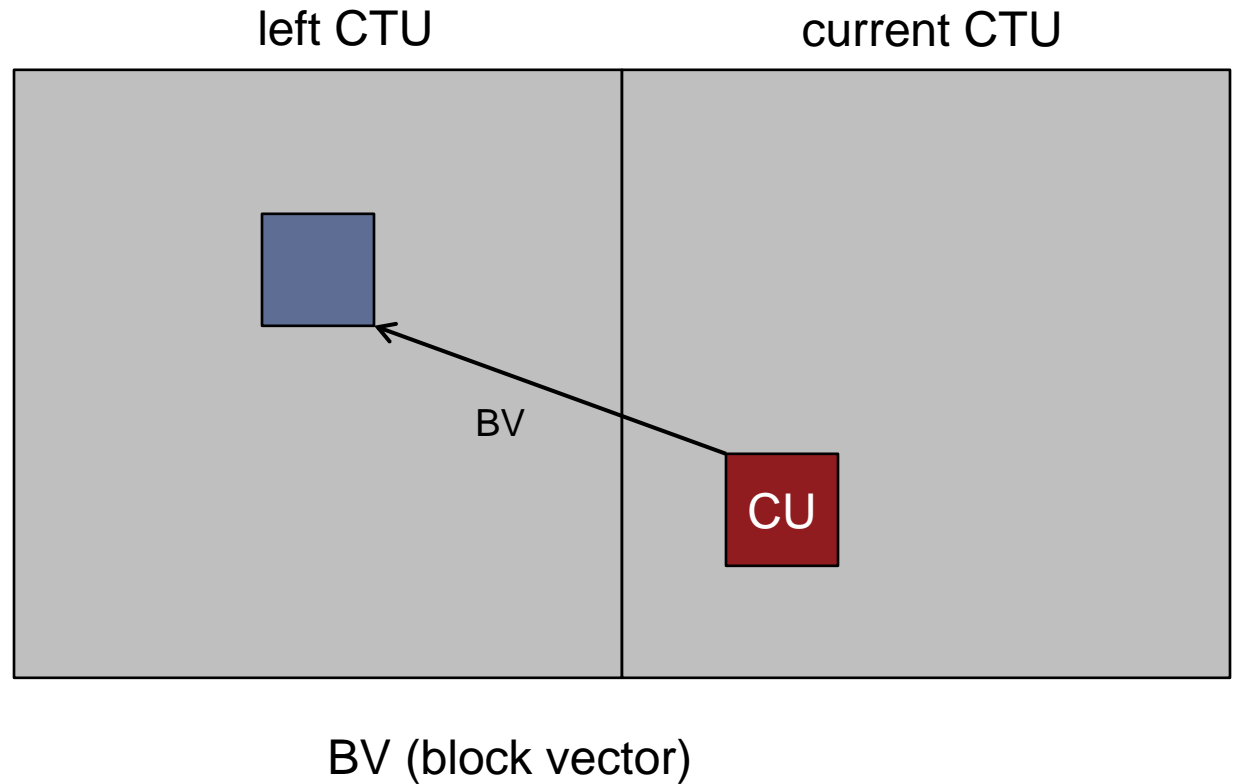
JCTVC-P0150

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Introduction

- **Intra block copy (Intra BC)**

  - JCTVC-N0256

left CTU   current CTU

$$BV$$

CU

BV (block vector)

Issue & Proposed

- **Issue**
  - Currently the first BV in each CTU uses zero BV, (0, 0), as predictor. But the zero vector is not an allowed BV value.

- **Proposed**
  - It is proposed to use (-2*CUWidth, 0) as the vector predictor for the first BV in each CTU.

Lossy

	All Intra HE Main-tier			All Intra HE High-tier			All Intra HE Super-High-tier		
	Y	U	V	Y	U	V	Y	U	V
Class F	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	0.0%	0.0%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC RGB 444	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%	0.0%
Animation RGB 444	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC YUV 444	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%	0.0%
Animation YUV 444	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC(444) GBR Optional	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
SC(444) YUV Optional	-0.1%	-0.1%	-0.1%	0.0%	0.0%	-0.1%	-0.1%	0.0%	-0.1%
Enc Time[%]	99%			100%			99%		
Dec Time[%]	102%			101%			100%		

	Random Access HE Main-tier			Random Access HE High-tier		
	Y	U	V	Y	U	V
Class F	-0.1%	-0.1%	0.0%	0.0%	-0.1%	0.0%
Class B	0.1%	-0.1%	-0.1%	0.1%	0.0%	-0.1%
SC RGB 444	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Animation RGB 444	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC YUV 444	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
Animation YUV 444	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC(444) GBR Optional	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
SC(444) YUV Optional	-0.3%	-0.2%	-0.2%	-0.3%	-0.1%	-0.2%
Enc Time[%]	97%			99%		
Dec Time[%]	101%			101%		

	Low delay B HE Main-tier			Low delay B HE High-tier		
	Y	U	V	Y	U	V
Class F	0.1%	-0.2%	0.6%	0.0%	-0.2%	0.0%
Class B	0.0%	0.2%	-0.1%	0.0%	0.1%	-0.1%
SC RGB 444	-0.3%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%
Animation RGB 444	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%
SC YUV 444	-0.1%	0.0%	0.0%	-0.1%	0.1%	-0.1%
Animation YUV 444	0.0%	-0.1%	-0.1%	0.0%	0.0%	-0.1%
RangeExt	0.0%	0.1%	-0.1%	0.0%	0.0%	-0.1%
SC(444) GBR Optional	-0.1%	-0.2%	-0.2%	0.3%	0.3%	0.4%
SC(444) YUV Optional	0.1%	0.1%	0.2%	0.1%	-0.1%	0.1%
Enc Time[%]	100%			102%		
Dec Time[%]	101%			102%		

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Lossless

	AI Main				RA Main				LB Main			
	Bit-rate saving				Bit-rate saving				Bit-rate saving			
	Total	Average	Min	Max	Total	Average	Min	Max	Total	Average	Min	Max
Class F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC RGB 444	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	-0.1%	0.1%	0.0%	0.0%	-0.1%	0.1%
Animation RGB 444	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC YUV 444	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	-0.1%	0.1%	0.0%	0.0%	-0.1%	0.1%
Animation YUV 444	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC GBR 444 Optional	0.1%	0.2%	0.0%	0.7%	0.0%	0.1%	-0.1%	0.5%	0.0%	0.2%	-0.3%	1.0%
SC YUV 444 Optional	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Enc Time[%]	97%				94%				95%			
Dec Time[%]	96%				102%				106%			

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Conclusions

- An improved BV predictor initialization method is proposed for Intra BC.

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