

JVET-P0381

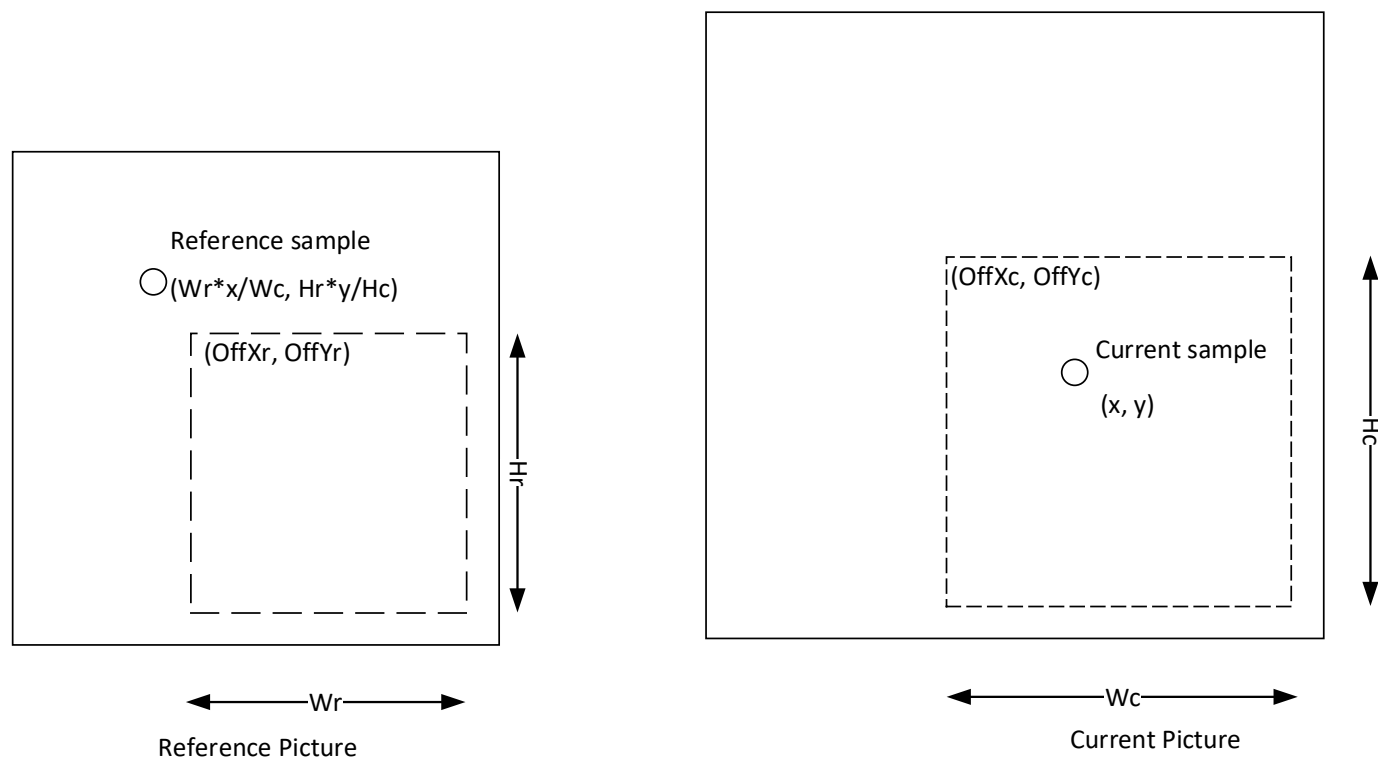
NON-CE1: A FIX ON REFERENCE SAMPLE OFFSET FOR RPR

Kai Zhang, Li Zhang, Hongbin Liu, Zhipin Deng, Jizheng Xu, Yue Wang



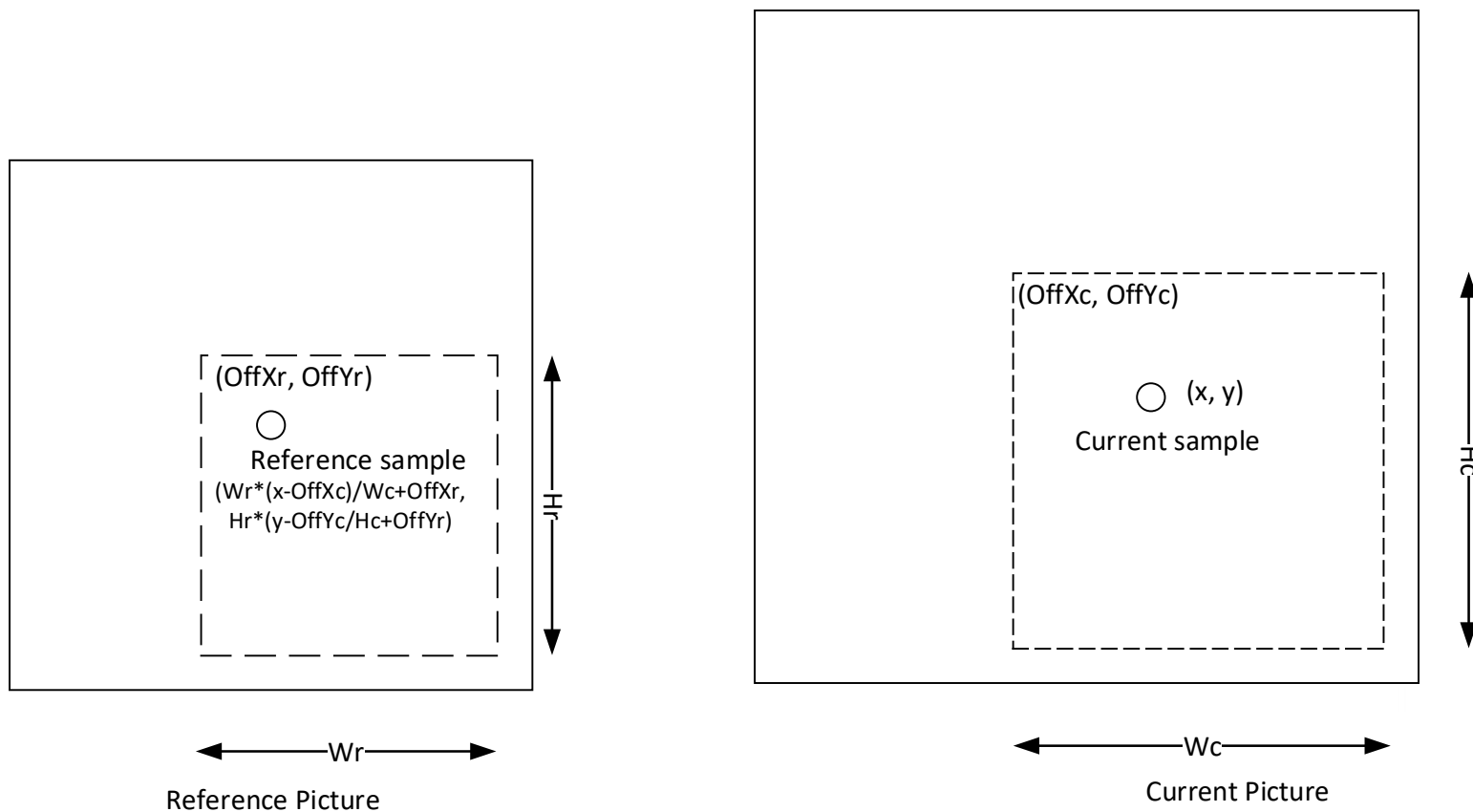
Background of RPR

- The reference sample position (x_r, y_r) is derived based on the current sample position (x_c, y_c) and a scaling ratio between the $W_r \times H_r$ conformance window in the reference picture and the $W_c \times H_c$ conformance window in the current picture: $x_r = x_c \times W_r / W_c$ and $y_r = y_c \times H_r / H_c$.
- However, when the top-left corner of the conformance window in the current picture and that in the reference picture are not at the same position, the derivation may result in a wrong position.



Proposed

- It is proposed to derive the reference sample position considering the non-zero offset between the two conformance windows as shown in Figure 1(b), formulated as
- $x_r = (x_c - OffXc) \times Wr / Wc + OffXr$ and $y_r = (y_c - OffYc) \times Hr / Hc + OffYr$,



Experimental results (nonCTC)

- The top-left corner of the conformance window in a $W \times H$ low-resolution picture is set to be (64, 64)

- Ratio = 1.5

	PSNR1					PSNR2				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class B	-16.12%	-21.00%	-21.71%	95%	100%	-16.32%	-19.13%	-19.52%	95%	100%
Class C	-9.21%	-10.13%	-9.02%	98%	101%	-8.28%	-8.51%	-7.32%	98%	101%
Class E	-28.48%	-47.97%	-48.31%	89%	101%	-35.87%	-45.12%	-46.30%	89%	101%
Overall	-16.91%	-24.12%	-24.13%	94%	101%	-18.53%	-22.09%	-22.15%	94%	101%
Class D	-10.12%	-13.76%	-12.75%	97%	101%	-9.18%	-13.70%	-12.12%	97%	101%

- Ratio = 2.0

	PSNR1					PSNR2				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
Class B	-16.66%	-24.33%	-24.91%	97%	101%	-14.48%	-20.38%	-20.50%	97%	101%
Class C	-7.58%	-14.56%	-13.91%	99%	99%	-6.63%	-10.73%	-9.91%	99%	99%
Class E	-21.67%	-47.18%	-47.74%	92%	99%	-28.01%	-40.05%	-42.26%	92%	99%
Overall	-14.89%	-26.79%	-26.95%	96%	100%	-15.25%	-22.08%	-22.41%	96%	100%
Class D	-6.46%	-14.61%	-14.17%	98%	102%	-5.75%	-13.62%	-12.12%	98%	102%

Conclusions

- Since the offset error of the reference sample derivation in RPR can be fixed, it is recommended that the proposed methods be adopted into VVC.
- Thanks Sharp for cross-checking our proposal ([JVET-P0938](#))