



JCTVC-G247

CAVLC counters normalization per LCU

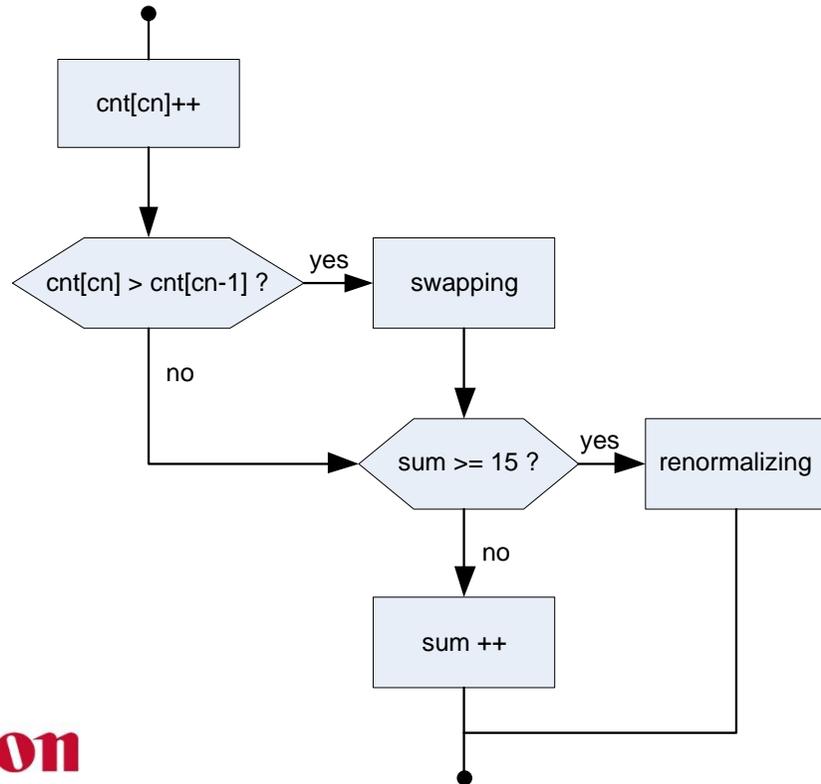
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Canon

Background

- Relates to counter-based adaptation for CAVLC
- Current design
 - Coding occurrence (counter sum) of syntax element is counted
 - Counters renormalized each time counter sum reaches 16

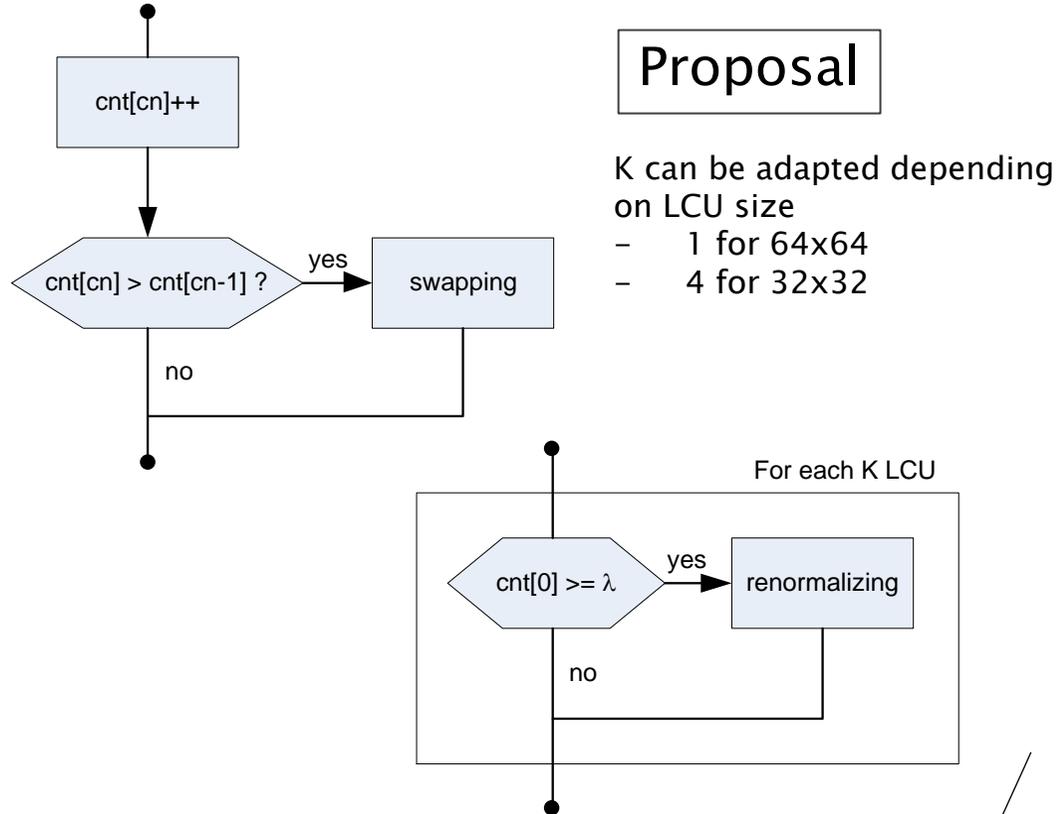
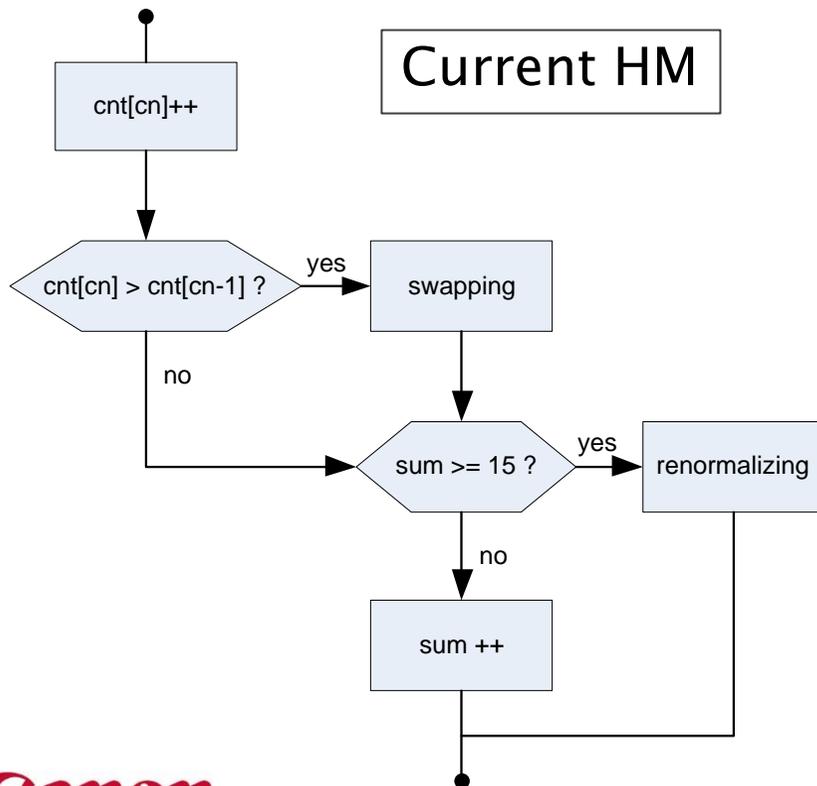


Need to check the counter sum at each coding of the syntax element

Proposal description

■ Reduce number of checks for each coding

1. Counters renormalization once per K LCU
2. Use `cnt[0]` instead of counter-sum for condition of renormalization



Results

■ Test different settings

- Different values of LCU renormalization period **K**
- Different number of bits for counters **N**
 - Counter saturation: $\text{cnt} = (\text{cnt}++) \& (2^N - 1)$
- Different values of renormalization threshold **λ**

■ Good Trade off: **K=1 N=6 $\lambda=32$**

- No significant impact on coding efficiency

	All Intra LC			Random Access LC			Low delay B LC		
	Y	U	V	Y	U	V	Y	U	V
Class A	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.1%			
Class B	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.2%	0.2%
Class C	0.0%	0.0%	0.0%	0.0%	-0.2%	0.1%	0.0%	0.1%	-0.1%
Class D	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	-0.1%
Class E	0.0%	0.0%	0.1%				-0.2%	0.3%	-0.2%
Overall	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
Enc Time[%]		99%			99%			99%	
Dec Time[%]		100%			100%			99%	

Conclusion

- Simplification of CAVLC counters normalization
 - Performed once each K (1) LCU
 - No more counter sum checking
 - No more use of counter sum
 - Limitation of counter bitdepth to 6 bits
- Negligible impact on coding performance