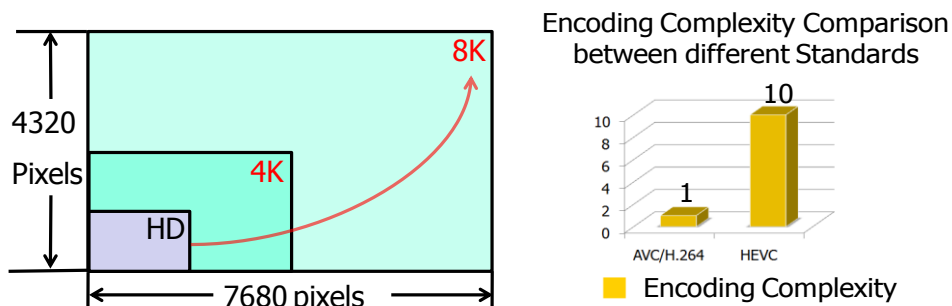


# Temporal Information based Adaptive Coding Unit Depth Decision for Low-Complexity HEVC Inter Prediction

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## Research background



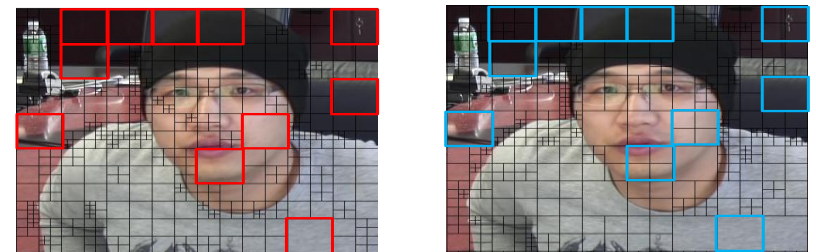
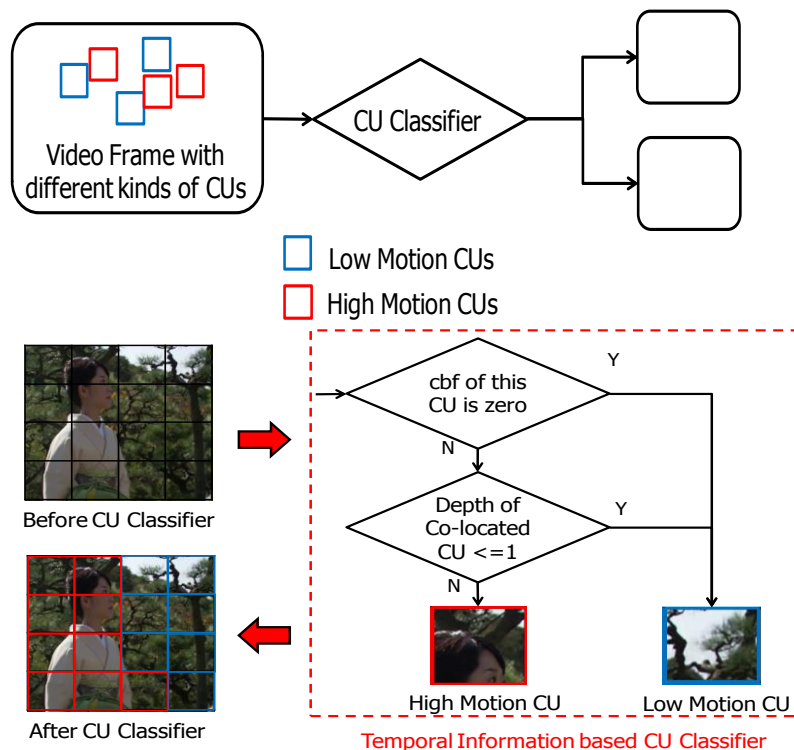
## Problem

1. Edge based CU Classifier is not accurate
2. Encoding Complexity of High Motion CUs are not reduced

## Research Target

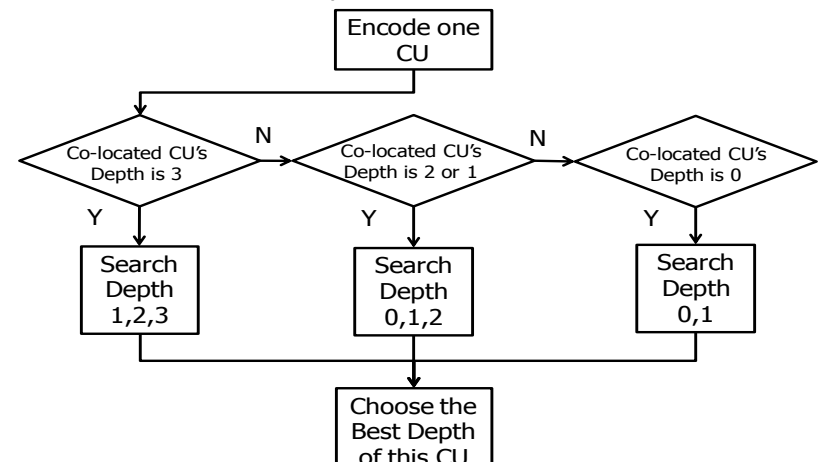
Reduce the encoding complexity for all the CUs equally with less quality loss

## Proposed method



		Current CU Depth			
Co-located CU Depth		0	1	2	3
	0	7	3	1	0

Table. 1 CU Depth Distribution of frame1&2



## Experimental result

Sequences Chosen:

➢ High Motion Sequences

Large movement, moving background

➢ Low Motion Sequences

Small movement, still background



Low Motion Sequences



High Motion Sequences

## Conclusions

### Proposal

- Temporal Information based CU Classifier
- Adaptive Coding Unit Depth Decision

### Result

- For high motion sequences, current proposal is 7.1% better than Guo's Paper.
- Performance on quality loss is better than the reference papers

Sequence		BD-bitrate [%]			$\Delta$ PSNR [dB]			Time Saving Rate [%]		
		Proposal	Lee's	Guo's	Proposal	Lee's	Guo's	Proposal	Lee's	Guo's
high motion sequence	Traffic	0.5	0.3	1.23	-0.01	-0.33	-0.04	43.2	24.2	31.46
	PeopleOnStreet	0.7	1.7	1.12	-0.02	-0.26	-0.03	42.7	33.8	32.65
	BasketballPass	1.2	1.1	1.14	-0.04	-0.74	-0.05	38.6	21.1	35.03
	BasketballDrive	1.5	1.5	1.56	-0.04	-0.68	-0.03	38.9	45.9	40.34
	BasketballDrill	1.1	1.4	0.52	-0.08	-0.18	-0.02	39.2	32.8	34.28
	RaceHorses	0.7	0.9	1.31	-0.07	-0.36	-0.05	40.5	37.7	27.91
	BlowingBubbles	0.6	0.9	1.52	-0.02	-0.53	-0.05	40.2	40.8	32.18
	Average	0.9	1.0	1.2	-0.04	-0.44	-0.04	40.5	33.7	33.4
low motion sequence	BQTerrance	1.0	0.8	1.94	-0.02	-0.73	-0.03	37.6	41.4	60.64
	Vidyo1	0.6	0.8	0.87	-0.03	-0.80	-0.02	35.2	35.1	72.02
	Vidyo4	0.8	0.6	1.62	-0.04	-0.73	-0.04	36.7	40.2	64.56
	Average	0.8	0.73	1.48	-0.03	-0.75	-0.03	36.5	38.9	65.7



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