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Non-CE8: Modification of directional classification for block-based adaptation on ALF

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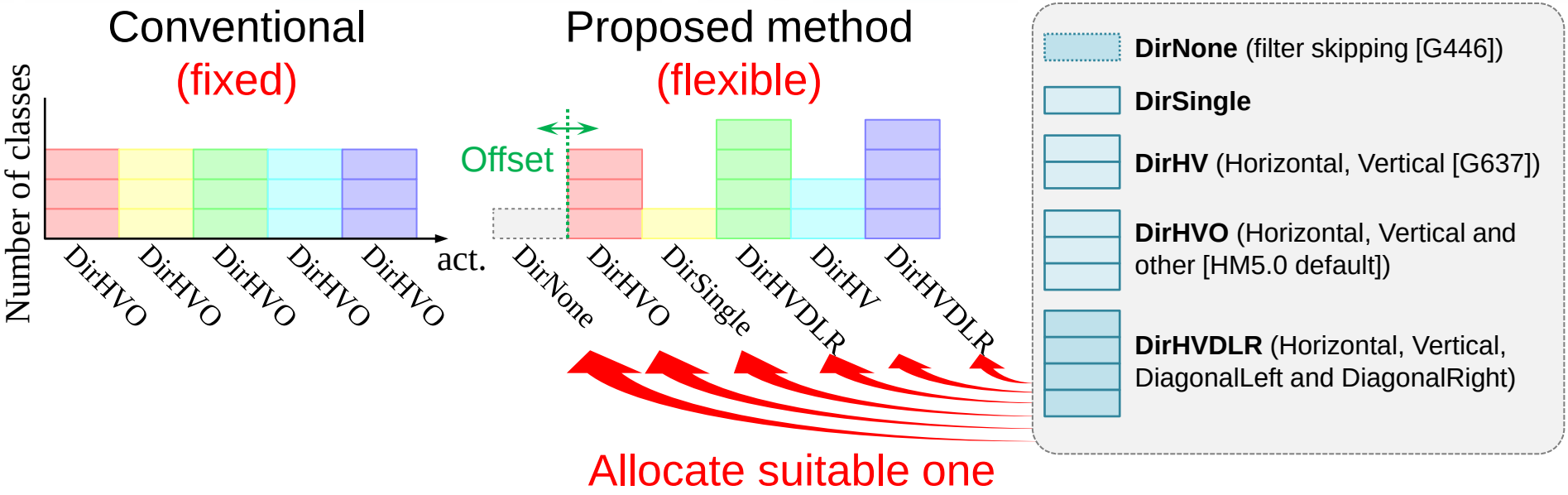
PROPOSAL

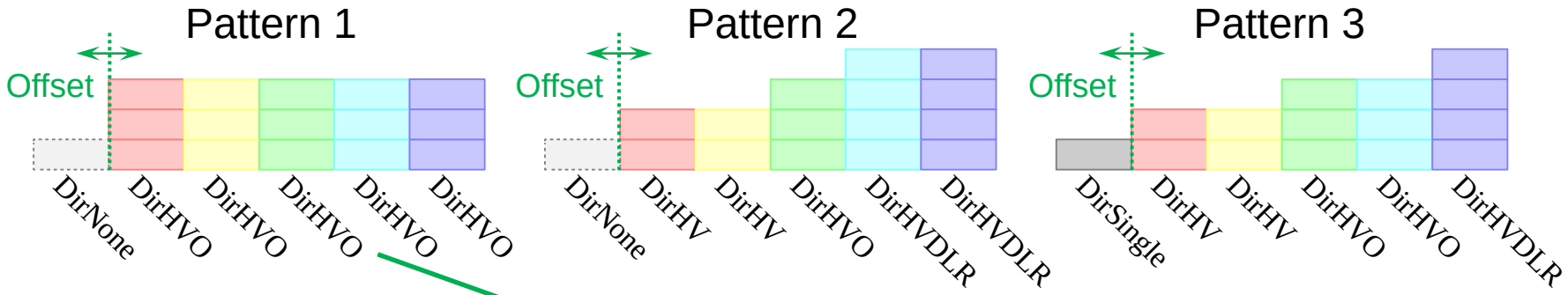
- Flexible classification for BA-mode



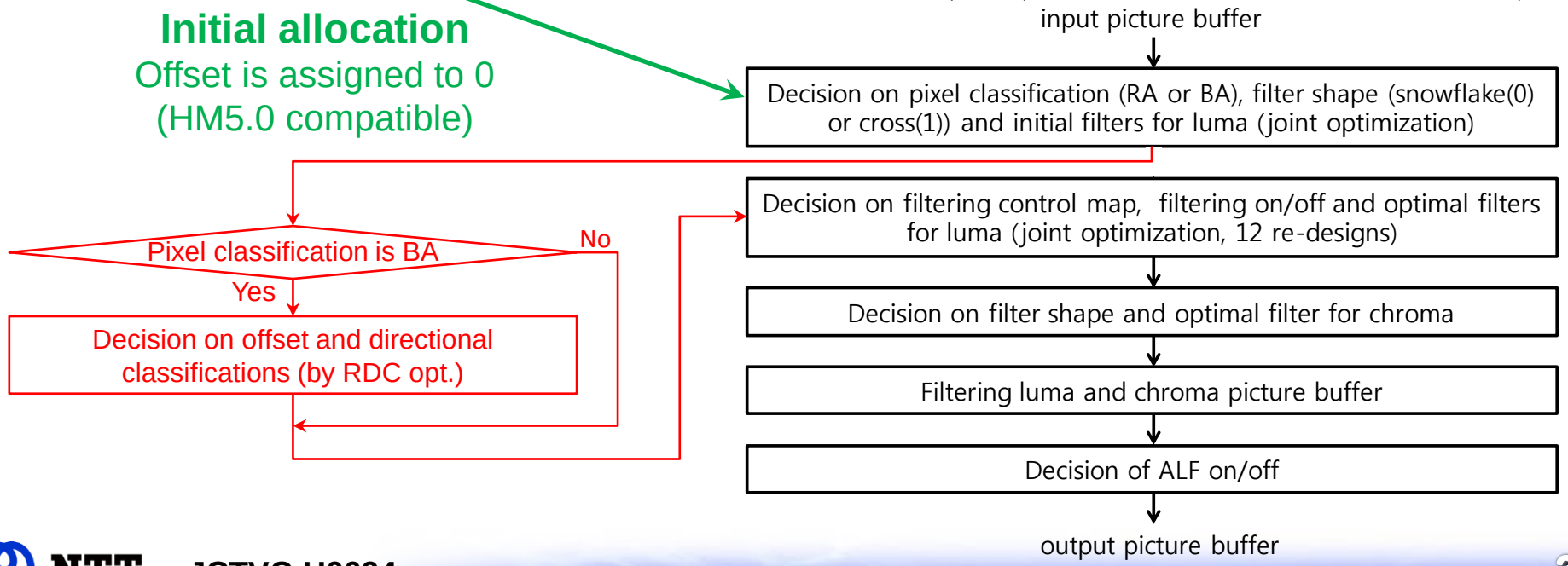
- Benefits
  - Decoding time reduction by filter skipping (DirNone)
  - Maintaining the coding efficiency by flexibility

Encoder description

- Choose the best pattern from among typical 3 patterns
  - Proposed syntax allows more flexible allocations, though



Initial allocation
Offset is assigned to 0
(HM5.0 compatible)



Objective evaluation

	All Intra HE			All Intra HE-10		
	Y	U	V	Y	U	V
Class A	0.2%	0.0%	0.0%	0.2%	0.0%	0.0%
Class B	0.2%	0.0%	0.0%	0.2%	0.0%	0.0%
Class C	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
Class D	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
Class E	0.2%	0.0%	0.0%	0.4%	0.0%	0.0%
Class F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Overall	0.14%	-0.02%	-0.02%	0.16%	-0.01%	-0.01%
	0.13%	-0.02%	-0.02%	0.16%	-0.01%	-0.01%
Enc Time[%]	99.2%			98.7%		
Dec Time[%]	97.7%			97.5%		

	Random Access HE			Random Access HE-10		
	Y	U	V	Y	U	V
Class A	0.2%	-0.1%	-0.1%	0.2%	-0.1%	0.1%
Class B	0.2%	-0.1%	-0.1%	0.2%	0.0%	0.1%
Class C	0.0%	0.0%	0.0%	0.1%	-0.1%	0.0%
Class D	0.1%	-0.2%	-0.1%	0.1%	0.0%	0.0%
Class E						
Class F	-0.1%	-0.1%	-0.1%	0.1%	0.1%	0.2%
Overall	0.12%	-0.06%	-0.07%	0.15%	-0.04%	0.03%
	0.13%	-0.08%	-0.07%	0.16%	-0.05%	0.02%
Enc Time[%]	99.2%			99.3%		
Dec Time[%]	97.6%			97.9%		

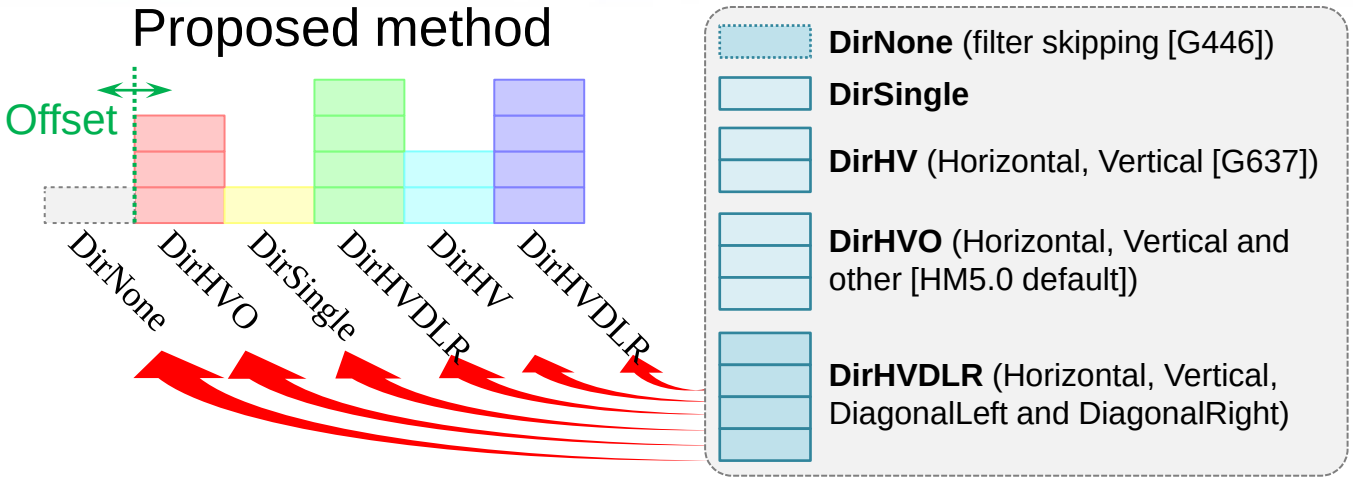
Objective evaluation

	Low delay B HE			Low delay B HE-10		
	Y	U	V	Y	U	V
Class A						
Class B	0.1%	0.0%	-0.1%	0.2%	0.0%	0.0%
Class C	0.0%	-0.2%	0.1%	0.1%	-0.2%	0.1%
Class D	0.0%	-0.1%	-0.1%	0.1%	0.0%	-0.2%
Class E	0.2%	0.3%	-0.1%	0.1%	-0.8%	0.2%
Class F	-0.1%	-0.3%	-0.4%	-0.1%	0.1%	0.2%
Overall	0.05%	-0.06%	-0.13%	0.08%	-0.14%	0.05%
	0.05%	-0.08%	-0.17%	0.08%	-0.13%	0.01%
Enc Time[%]	99.0%			99.0%		
Dec Time[%]	97.7%			98.1%		

	Low delay P HE			Low delay P HE-10		
	Y	U	V	Y	U	V
Class A						
Class B	0.2%	0.1%	-0.2%	0.1%	0.0%	0.2%
Class C	0.1%	0.1%	-0.3%	0.2%	-0.4%	0.1%
Class D	0.1%	-0.2%	0.2%	0.2%	0.3%	0.1%
Class E	0.0%	0.2%	0.0%	0.0%	0.0%	0.1%
Class F	0.1%	0.1%	-0.1%	0.1%	0.0%	0.1%
Overall	0.12%	0.09%	-0.13%	0.14%	-0.02%	0.06%
	0.12%	0.09%	-0.16%	0.14%	0.00%	0.07%
Enc Time[%]	99.2%			99.2%		
Dec Time[%]	97.0%			97.4%		

Conclusion

- Adaptive directional classification is proposed



- Compared to the HM5.0 anchor
  - BD-rate losses were 0.05 - 0.16 [%] (X-checked by KDDI) with encoding time reduction of **0.7 - 1.3 [%]** and decoding time reduction of **1.9 - 3.0 [%]** [H0158]
- Suggestion
  - Adopt this modification in HM/WD