JCTVC-I0260:
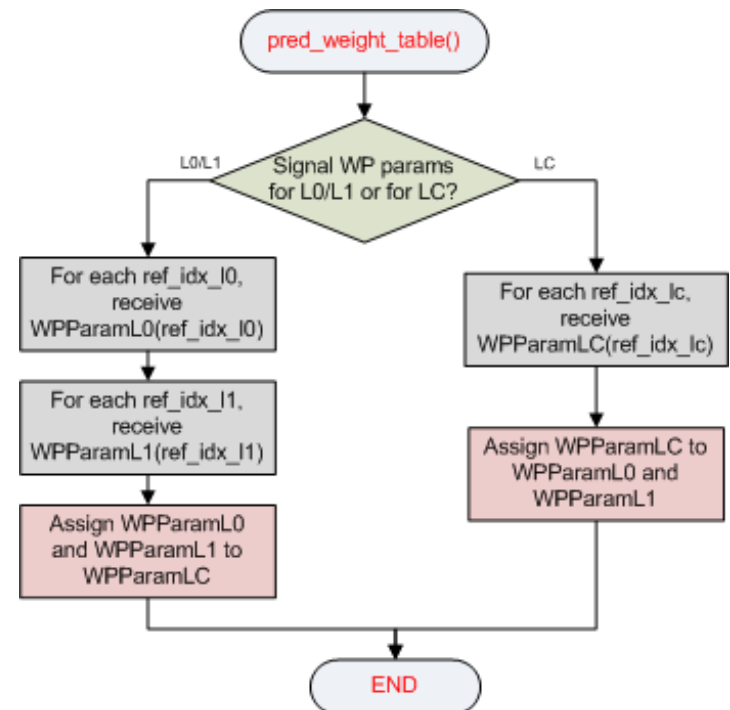# On weighted prediction parameter signalling

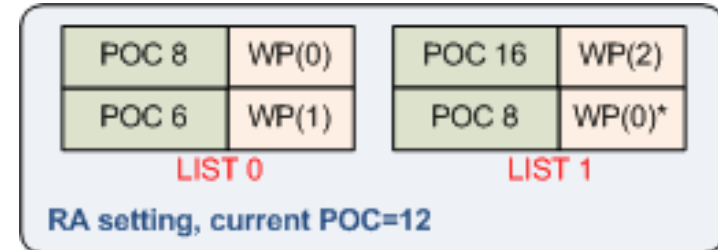Y. He, J. Dong, Y. Ye, E.S. Ryu
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- When explicit WP is used, weights and offsets for luma and chroma components are signaled
- In WD6, two signaling methods are used
  - Indexed by entries in LC if ref_pic_list_combination_flag is 1
  - Indexed by entries in L0 and L1 if ref_pic_list_combination_flag is 0

- Drawbacks of the current scheme:
  - LC is a "virtual" list constrained to be subset of combination of L0 and L1
    - Potential problem of "missing" WP parameters
    - Need to invoke LC modification if L0 and L1 WP parameters differ
  - Redundancy if ref_pic_list_combination_flag = 0
  - Two additional arrays need to be defined to correct problems in decoding process 8.5.2.2.3.2
- Toshiba's proposal I0279 fixes some problems above
- Additional proposals on WP signaling
  - I0335 (Qualcomm), I0421 (Panasonic) , I0439 (LG)

pred_weight_table()

L0/L1 — Signal WP params for L0/L1 or for LC? — LC

For each ref_idx_l0, receive WPParamL0(ref_idx_l0)

For each ref_idx_l1, receive WPParamL1(ref_idx_l1)

Assign WPParamL0 and WPParamL1 to WPParamLC

For each ref_idx_lc, receive WPParamLC(ref_idx_lc)

Assign WPParamLC to WPParamL0 and WPParamL1

END

- To always signal WP parameters for L0 and L1 entries
  - WP parameters for LC entries are "inherited" from L0 and L1
    - PredLCToPredLx[refIdxLC] and RefIdxLCToRefIdxLx[refIdxLC]
  - If different parameters for LC are desired, then use LC modification

- Benefits:
  - Current problems fixed
  - Reduced syntax table and semantics
  - Allows same picture appearing on both L0 and L1 to have different WP parameters

POC 8	WP(0)	POC 16	WP(2)
POC 6	WP(1)	POC 8	WP(0)*

LIST 0   LIST 1

RA setting, current POC=12

- To reduce bit overhead associated with WP signaling, WP parameter prediction is performed
  - WP parameters for the same ref picture are likely to be highly correlated
  - If WP parameters already signaled for a given picture, use those as prediction
  - Also applies to entries in the same list when ref picture duplication is used

- Implementation based on HM6.1
- Fading sequences generated using JCTVC-F018 fading tools
- RA-main and LD-main settings, QP=22
  - RA-main: ref_pic_list_combination_flag = 1
  - LD-main: ref_pic_list_combination_flag = 0
- Average #bits/picture for pred_weight_table() signaling
  - 2.7% increase (<2 bits/picture) for RA
  - 48.2% reduction (94 bits/picture) for LD

	HM6.1	proposed	Δbits/pic	% change
RA-main	69.05	70.93	1.88	2.7
LD-main	195.14	101.00	-94.14	-48.2

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- With WP signaling in WD6, to allow WP parameters to be different for L0 and L1, LC modification must be used
- Increased signaling overhead
  - pred_weight_table() and ref_pic_list_combination()
- Encoder-only change:
  - If weight/offset is rounded down during derivation for L0, then round up for L1, and vice versa
- Overall 16.6% bit overhead saving
  - 9% savings for WP table, 79% savings for list combination

	HM6.1			proposed			% change		
	WP	LC	total	WP	LC	total	WP	LC	total
RA-main	88.54	10.84	99.38	80.52	2.31	82.83	-9.1	-78.7	-16.6

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