

JCTVC-G157

Reference List Construction  
for Random Access Settings

Presented by Hendry  
LG Electronics

# Proposal Item

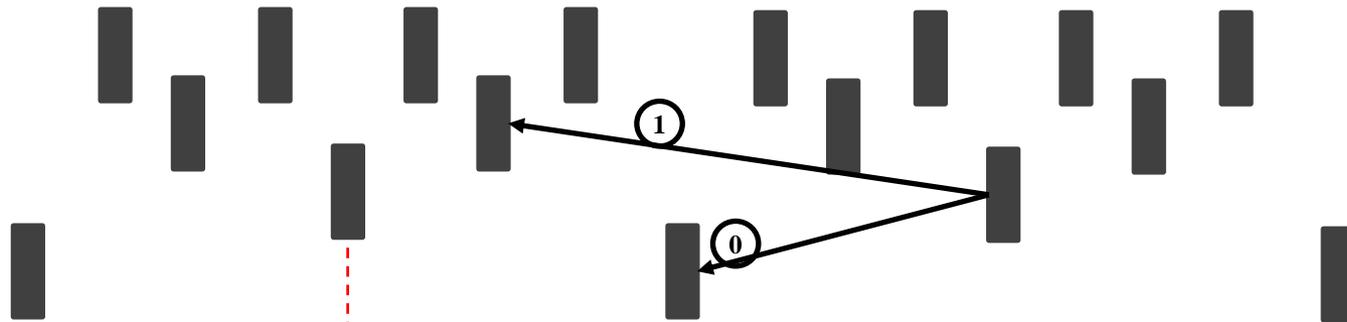
---

- In Torino meeting, reference pictures selection for low delay was modified
  - 3 highest available reference pictures
  - 1 recent reference picture
- But, no change to reference pictures selection for random access yet
  - Sort ref pics based on POC / frame number
  - Select the top n ref pics after the above sorting
- Proposal
  - Sort ref pics based on POC first, then based on QP relative to current picture
  - Select the top n ref pics after the above sorting
- Performance: RAHE (-0.4%Y, -0.4U, -0.4V) – RALC (-0.5%Y, -0.8U, -0.7V)
- Required changes – minimum
  - Modify one function only in HM ref soft (TComSlice::setRefPicList)
  - Add some lines in Section 8.2.2.2

# Current Ref Pic Initialization Process

- Consider only temporal distance between current picture and ref pics
  - After sorting, ref pics nearer to current picture shall fill *RefPicListX*
  - But, they may not be the best candidate actually

POC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	IDR	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

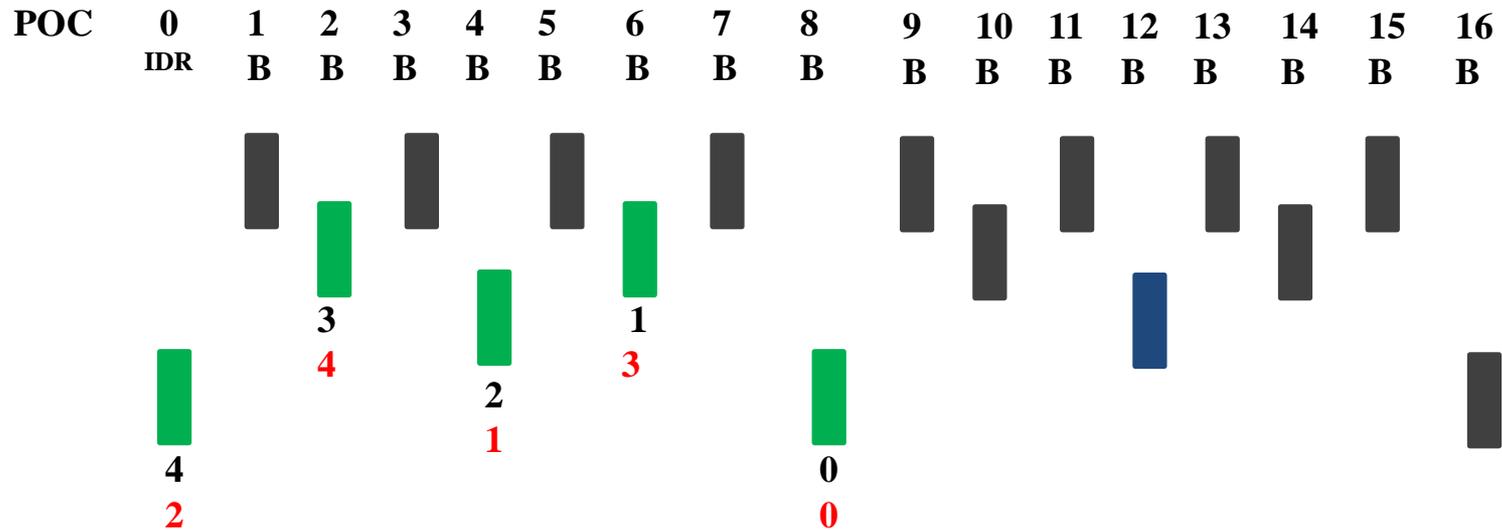


This might be a better candidate than pic with POC 6

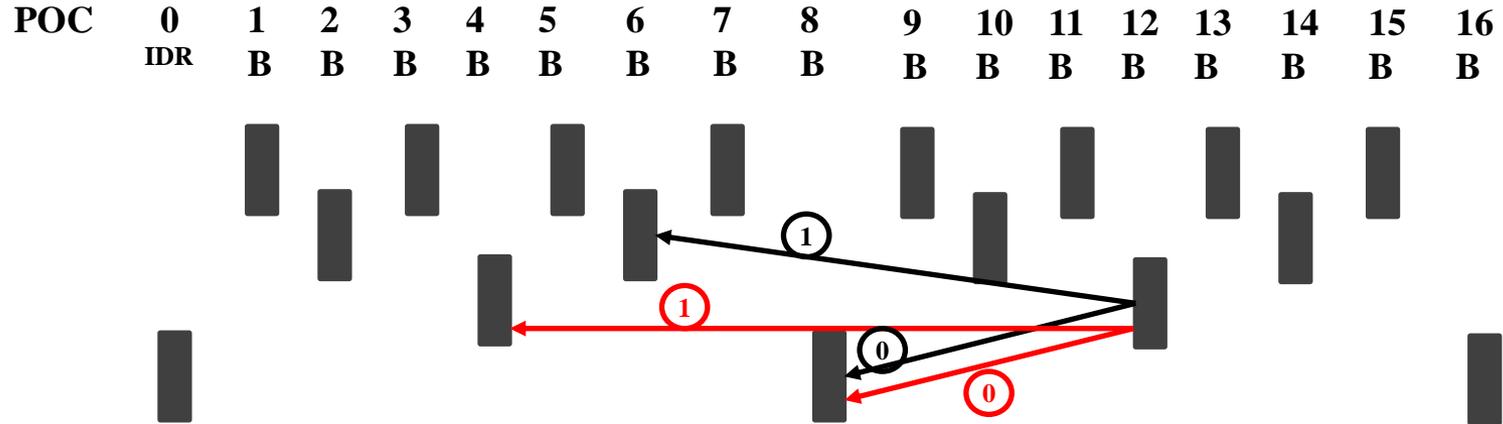
- Coded with better QP
- Not too further way

# Proposed method

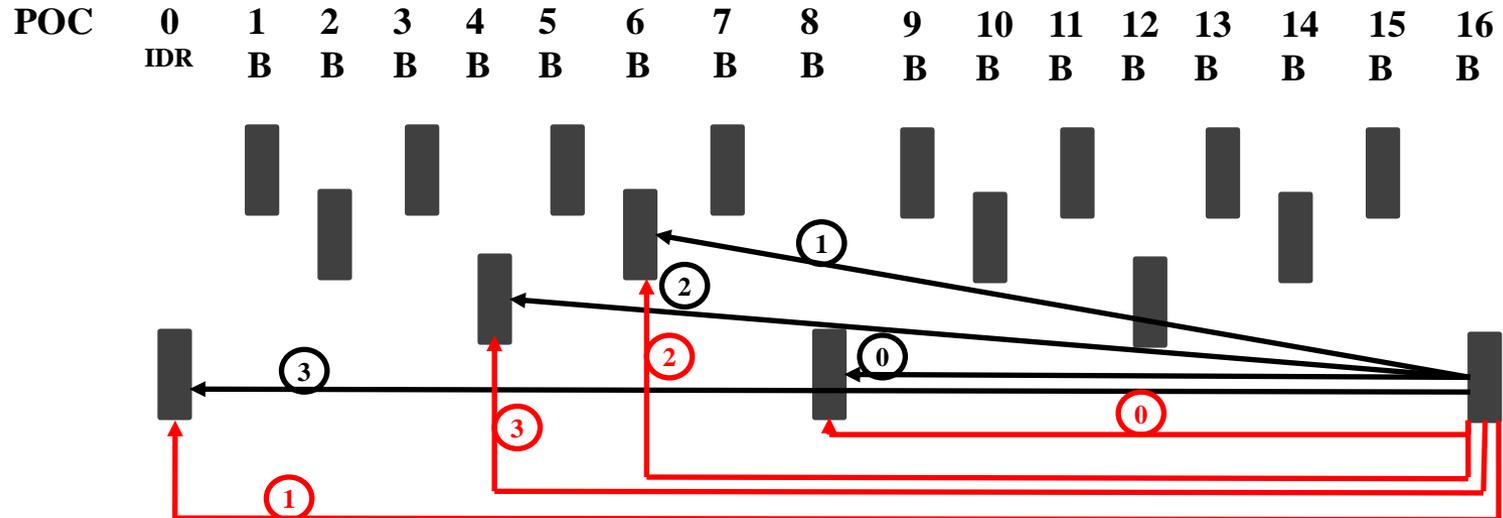
- Apply sorting based on POC as in current process, then
- Apply additional sorting based on relative POC of ref pics to POC of current picture, that is, swap ref pic at index  $jj$  &  $jj - 1$ , if:
  - POC of both ref pics are both lower or both higher than that of current pic
  - QP of ref pic at index  $jj - 1$  is worse than QP of current picture
  - QP of ref pic at index  $jj$  is not worse than QP of current picture



# Effect if proposed scheme is applied



- Reference with current scheme
- Reference with proposed method
- ⊙<sub>x</sub> Order of reference picture in current scheme
- ⊙<sub>x</sub> Order of reference picture in proposed scheme



# Performance

	Random Access HE			Random Access LC		
	Y	U	V	Y	U	V
Class A	-0.1%	-0.5%	-0.4%	-0.1%	-0.8%	-0.9%
Class B	-0.3%	-0.3%	-0.1%	-0.4%	-0.6%	-0.4%
Class C	-0.6%	-0.7%	-0.5%	-0.8%	-0.8%	-0.8%
Class D	-0.5%	-0.4%	-0.5%	-0.7%	-0.8%	-0.9%
Class E						
<b>Overall</b>	-0.4%	-0.4%	-0.4%	-0.5%	-0.8%	-0.7%
	-0.4%	-0.4%	-0.4%	-0.5%	-0.7%	-0.7%
Enc Time[%]		100%			100%	
Dec Time[%]		99%			101%	

- Anchor: HM-4.0 with common test condition
- Cross-check by Panasonic – JCTVC-G500

# Conclusion

---

- Simple modification to ref pic selection is proposed for random access settings
  - Rather than sorting ref pics in DPB based on POC only, consider adding QP as well
- Gains because of using better coded picture for inter prediction
- Thank you to Panasonic for doing the cross-check
- Recommend JCTVC group to adopt the proposed scheme