

**JCTVC-F397**

# **Weighted Prediction with Parameter Estimation**

S. Takamura, Y. Bando, S. Matsuo,  
M. Matsumura, K. Kamikura and H. Jozawa

NTT Cyber Space Laboratories

NTT Corporation, Japan



# Summary

- One of the mandates of Weighted Prediction AHG
  - “Discuss and develop analysis software for estimating weighting parameters for explicit WP.”
- One WP estimation method is evaluated based on the software developed by the AHG [F265]
- Results (Y-BDRate gain)
  - with given parameter: 17.6-28.7%
  - with estimated parameter: 17.0-28.2%
  - Estimation time: < 4 seconds

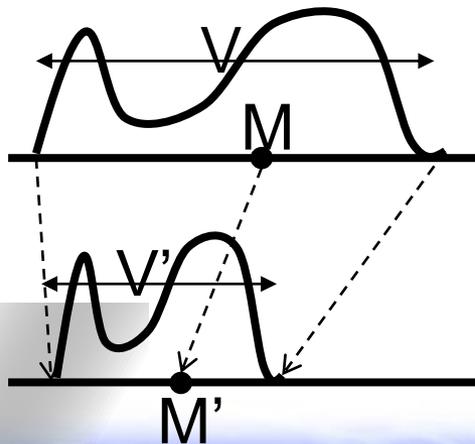
# Condition

- ❑ Software with WP support
  - HM3.0-based
  - Provided by the AhG
- ❑ Faded sequences
  - Controlled B/W fading
  - ~2 seconds duration
  - Provided by the AhG
- ❑ Other conditions are based on common conditions

# WP parameter estimation

[Aoki and Miyamoto, ICIP2008]

- Two image features (at time  $t$ )
  - $M(t)$ : average of the frame
  - $V(t)$ : L1-distance between  $M$  and the frame
- weight ( $w$ ) and offset ( $o$ ) between  $t_{\text{enc}}$  and  $t_{\text{ref}}$  are:
  - $w = V(t_{\text{enc}}) / V(t_{\text{ref}})$
  - $o = M(t_{\text{enc}}) - w * M(t_{\text{ref}})$
- Histogram interpretation



$$V' = w * V$$

$$M' = w * M + o$$

# Results (Y-BDRate, encT, decT)

## Black fade

	Given param.		Estimated param.	
	HE	LC	HE	LC
RA	-17.6	-19.6	-17.0	-19.1
	121%	128%	121%	128%
	100%	103%	103%	104%
LD B	-22.6	-28.5	-21.8	-27.7
	117%	127%	116%	126%
	85%	86%	90%	89%
LD P	-23.8	-28.7	-23.1	-28.2
	100%	109%	101%	110%
	82%	81%	88%	86%

## White fade

	Given param.		Estimated param.	
	HE	LC	HE	LC
RA	-18.4	-20.3	-19.4	-21.6
	119%	125%	117%	123%
	105%	107%	104%	105%
LD B	-21.0	-28.0	-20.4	-27.3
	116%	126%	115%	124%
	88%	90%	89%	93%
LD P	-22.3	-28.5	-21.6	-28.0
	100%	108%	100%	107%
	86%	86%	87%	91%

# Conclusion

- ❑ Confirmed the performance of WP
- ❑ Demonstrated a robust, low-complexity parameter estimation method
- ❑ Future work
  - To investigate good estimation for 1-pass coding
  - HM w/o WP vs. JM w/ WP

**Thank you, questions?**