



CREATING THE LIVING NETWORK™

JVET-G0028

InterDigital's Response to the SDR
Category in Joint Call for Evidence on
Video Compression with Capability
beyond HEVC

Xiaoyu Xiu, Yuwen He, Yan Ye
InterDigital Communications Inc.
July 2017



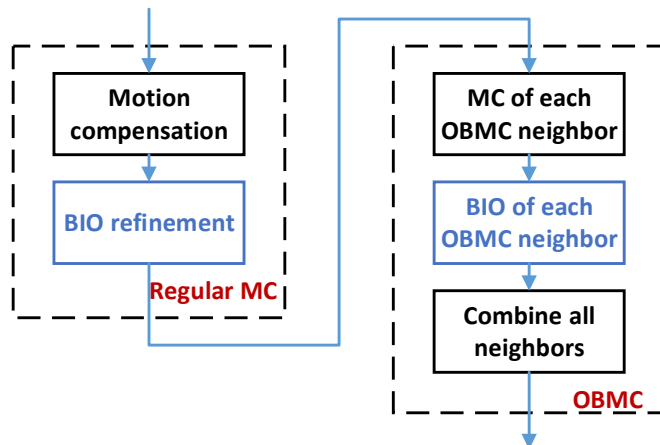
Introduction

- This is InterDigital's response to the CfE in the SDR category
- The proposed solution is built upon JEM-6.0 platform with two BIO simplifications
- Performance summary
 - Compared to HM anchors, BD-rate reduction of 34.2%, 9.9 and 8.7 times increase in encoding and decoding time
 - Compared to JEM anchors, 0.14% BD-rate increase, 8% and 25% reductions in encoding and decoding time

BIO simplifications in this response

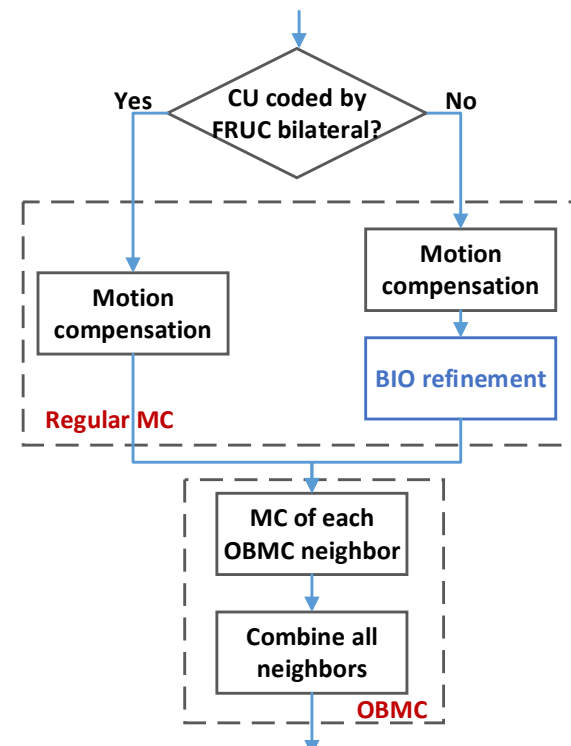
BIO in JEM-6.0

- Applied at both the regular MC stage and the OBMC stage
- Applied to bi-predicted blocks/sub-blocks in all inter coding modes under certain conditions



BIO in this response

- Core design the same as in JEM-6.0
- Remove BIO from the OBMC stage (same as in EE2)
- Disable BIO for CUs coded by the FRUC bilateral mode



Simulation results

- Anchor: HM CfE anchors
- Test: The response

Sequence	BD rate			Encoding (times)	Decoding (times)
	Y	U	V		
Class A	-36.5%	-44.3%	-45.2%	11.5	9.9
Class B	-30.5%	-49.2%	-51.7%	10.5	9.6
Average	-34.2%	-46.2%	-47.7%	10.9	9.7

Simulation results

- Anchor: JEM CfE anchors
- Test: The response

Sequence	BD rate			Encoding (%)	Decoding (%)
	Y	U	V		
Class A	0.14%	0.04%	0.05%	92%	77%
Class B	0.13%	-0.11%	-0.19%	91%	74%
Average	0.14%	-0.02%	-0.04%	92%	75%

Closing remarks

- Two simplifications are applied to BIO in the JEM-6.0
 - BIO is removed from the OBMC stage
 - BIO is disabled at the regular MC stage for CUs coded by the FRUC bilateral mode
- Coding/complexity performance

	BD rate	Enc time	Dec time
HM anchor	34.2% reduction	9.9x increase	8.7x increase
JEM anchor	0.14% increase	8% reduction	25% reduction

Careful study of the interaction among the JEM coding tools is needed to speed up encoding/decoding and simplify design without comprising performance

THANK YOU!



Simulation results

- Anchor: HM CfE anchors
- Test: The response

Sequence		Y	U	V	Encoding (times)	Decoding (times)
Class A	Crosswalk1	-37.8%	-43.8%	-47.5%	11.2	11.0
	FoodMarket3	-34.9%	-46.6%	-48.9%	8.8	9.6
	Tango1	-36.3%	-55.1%	-49.6%	13.0	10.9
	CatRobot1	-40.0%	-52.3%	-45.4%	10.5	11.0
	DaylightRoad1	-40.6%	-53.5%	-38.1%	11.2	9.9
	BuildingHall1	-33.3%	-41.4%	-46.5%	6.5	8.7
	ParkRunning2	-31.5%	-26.1%	-29.2%	11.9	10.7
	CampfireParty	-37.9%	-35.7%	-56.6%	18.9	7.7
Class B	BQTerrace	-30.4%	-50.6%	-61.2%	7.6	9.3
	RitualDance	-27.7%	-38.0%	-41.7%	16.9	9.1
	Timelapse	-26.7%	-61.4%	-67.0%	7.2	9.4
	BasketballDrive	-32.0%	-46.9%	-43.4%	14.7	10.0
	Cactus	-35.9%	-49.1%	-45.1%	11.4	10.1
Average		-34.2%	-46.2%	-47.7%	10.9	9.7

Simulation results

- Anchor: JEM CfE anchors
- Test: The response

Sequence		Y	U	V	Encoding (%)	Decoding (%)
Class A	Crosswalk1	0.17%	0.20%	0.22%	93%	75%
	FoodMarket3	0.06%	0.02%	0.13%	92%	76%
	Tango1	0.14%	-0.06%	-0.07%	93%	73%
	CatRobot1	0.43%	0.17%	0.14%	91%	69%
	DaylightRoad1	0.17%	-0.04%	-0.01%	91%	82%
	BuildingHall1	0.08%	-0.01%	-0.05%	92%	66%
	ParkRunning2	0.04%	0.03%	0.03%	89%	81%
	CampfireParty	0.04%	0.00%	0.01%	93%	83%
Class B	BQTerrace	0.07%	-0.14%	0.00%	91%	79%
	RitualDance	0.14%	-0.16%	-0.04%	92%	84%
	Timelapse	0.13%	-0.19%	-0.76%	92%	60%
	BasketballDrive	0.15%	0.02%	-0.08%	91%	82%
	Cactus	0.15%	-0.06%	-0.09%	90%	64%
Average		0.14%	-0.02%	-0.04%	92%	75%