

JCTVC-Q0074

SEI message for Colour Mapping Information

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technicolor



Context

- Migrating to WCG vs legacy
- Different services, different grades
- Preserve artistic intent from studios
- Ensure rendered colours fidelity at home

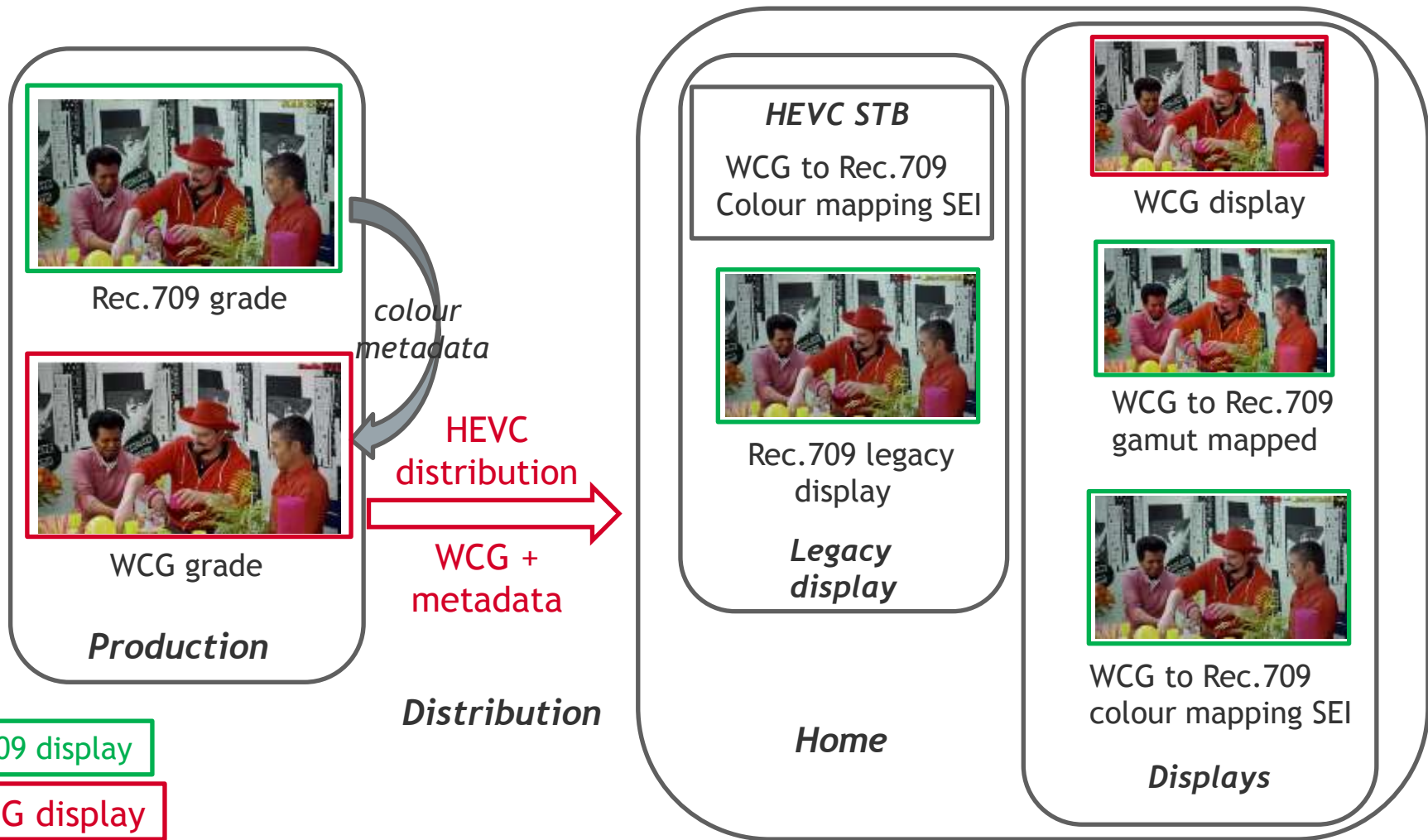
Issues previously addressed

- Scope: clarified
- Complexity: low + using existing resources from targeted devices
- Persistence: like Tone Mapping SEI + JCTVC-Q0183 clarifications

Colour Mapping Info SEI: Applications

■ Example: backward compatibility

- Aid mapping if Rec. 2020 signal rendering is optional for UHD-1 phase 1 devices
- Automatic gamut mapping cannot capture colorist choice (non-deterministic)



Colour Mapping Info SEI: Visually...

Colour graded BT.709



*Colour graded BT.2020
converted to BT.709*



- Hue shift
- Over saturation
- Shadows overprinted
- Darker look
- Colours balance moved
- Global look corrupted
- ...
- Artistic intent skewed

*BT.2020 colour mapped to
BT.709 using proposal*

*Colour graded BT.2020 displayed
as is on BT.709 display*



Colour Mapping Info SEI: Proposition

- Syntax/semantics inspired from:
 - Targeted color space: VUI
 - Model:
 - Tone Mapping SEI + Film Grain SEI
 - Leveraging existing CE resources
- Editorial: identified issues addressed
- Synchronization:
 - One SEI per long sequence gives visually coherent results
 - Artistic intent coherent between grades to keep storytelling consistent
 - Production side: « trim pass » then adaptation and visual control
 - Live broadcast: grading presets consistent temporally
 - Optimal is one per shot/sequence (Blu-Ray, VoD, OTT)
- Softwares provided:
 - SEI implementation in encoder and decoder (HM13.0/RExt6.0)
 - Model parameters identification

Colour Mapping Info SEI: Syntax proposition

Target colour space characteristics

Piece-wise linear model per component

3x3 matrix

Piece-wise linear model per component

colour_mapping_info(payloadSize) {	Descriptor	
colour_map_id	u(1)	
colour_map_cancel_flag	u(1)	
if(!colour_map_cancel_flag) {		
colour_map_persistence_flag	u(1)	
colour_map_video_signal_type_present_flag	u(1)	
if(colour_map_video_signal_type_present_flag) {		
colour_map_video_full_range_flag	u(1)	
colour_map_primaries	u(8)	
colour_map_transfer_characteristics	u(8)	
colour_map_matrix_coeffs	u(8)	
}		
}		
colour_map_coded_data_bit_depth	u(5)	
colour_map_target_bit_depth	u(5)	
colour_map_model_id	u(6)	
if(colour_map_model_id== 0) {		
for(c = 0; c < 3; c++) {		
pre_lut_num_pivots_minus1[c]	u(16)	
if(pre_lut_num_pivots_minus1[c] > 0) {		
for(i = 0; i <= pre_lut_num_pivots_minus1[c]; i++) {		
pre_lut_coded_pivot_value[c][i]	u(16)	
pre_lut_target_pivot_value[c][i]	u(16)	
}		
}		
}		
}		
colour_map_matrix_present_flag	u(1)	
if(colour_map_matrix_present_flag) {		
log2_matrix_denom	u(4)	
for(i = 0; i < 3; i++) {		
for(j = 0; j < 3; j++) {		
colour_map_coeffs[i][j]	se(16)	
}		
}		
}		
for(c = 0; c < 3; c++) {		
post_lut_num_pivots_minus1[c]	u(16)	
if(post_lut_num_pivots_minus1[c] > 0) {		
for(i = 0; i <= post_lut_num_pivots_minus1[c]; i++) {		
post_lut_coded_pivot_value[c][i]	u(16)	
post_lut_target_pivot_value[c][i]	u(16)	
}		
}		
}		
}		
}		
}		

VUI-like/
Film Grain
SEI-like
syntax
elements

Close from
tone
mapping
SEI
model 3

Close from
tone
mapping
SEI
model 3

Colour Mapping Info SEI: Conclusion

- Aid colour mapping
 - Preserving content creator intent/colour fidelity
 - Keeping TV sets manufacturers differentiation
 - Benefits already shown in demo
- Low-complexity model
 - use limited resources from CE devices
- HEVC v1 & RExt profiles/applications related
 - Cf. parent-body comment
- Softwares supplied
 - on top of HM13.0-RExt6.0
 - parameters identification provided for the model

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