



REDEFINING MOBILITY



# **JCT3V-D0195:** CE6.h related: Unification of new intra modes in 3D- HEVC

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# Summary

- A unified intra mode singling design for all the new Intra modes
  - Depth Modeling Mode (DMM) modes
  - Chain Coding Mode (CCM)
  - Simplified Depth Coding (SDC) modes
- It significantly simplifies the syntax design of the current 3D-HEVC and enables to a large extent decoupling the parsing of HEVC syntax elements and the newly added syntax elements
- Simulation results report:
  - 0.14% coding gain in CTC
  - 0.1% coding gain for total video and 0.06% coding loss for synthesized views in all intra coding case

# Background

- Three new sets of intra modes are introduced on top of HEVC intra modes
  - DMM (with mode 1, 2, 3 and 4)
  - chain coding mode
  - SDC modes
- Problems
  - The syntax design for the existing modes is managed not in a systematic manner: a lot of unnecessary flags are introduced to signal different modes and combinations.
  - Too much interaction between the HEVC syntax elements and the 3D-HEVC syntax elements, therefore, unnecessary complication is introduced for 3D-HEVC parsers if built on top of an existing HEVC version 1 decoder implementation.

# Proposed method

- All newly introduced modes, including DMM, SDC, and CCM are signalled by one syntax element: `depth_intra_mode`. Based on this value of this syntax element, other additional information is signalled.
- All depth intra prediction modes are signalled in a unique syntax table and interact with minimum interaction with the HEVC syntax elements.

# Simulation results

## ■ Results

- Platform: HTM 6.0
- Test conditions: CTC

	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate
Balloons	0.0%	0.1%	0.00%	-0.11%	-0.11%
Kendo	0.0%	0.0%	0.00%	-0.27%	-0.18%
Newspapercc	0.0%	0.1%	0.01%	-0.05%	-0.07%
GhostTownFly	0.2%	0.2%	0.05%	0.03%	0.03%
PoznanHall2	-0.4%	0.0%	-0.11%	-0.08%	-0.18%
PoznanStreet	0.1%	0.0%	0.01%	-0.02%	0.06%
UndoDancer	0.0%	0.1%	0.01%	0.05%	-0.51%
1024x768	0.0%	0.1%	0.01%	-0.14%	-0.12%
1920x1088	0.0%	0.0%	-0.01%	-0.01%	-0.15%
<b>average</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.00%</b>	<b>-0.06%</b>	<b>-0.14%</b>

# Simulation results

## ■ Results

- Platform: HTM 6.0
- Test conditions: all intra case

	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate
Balloons	0.00%	0.00%	0.00%	-0.16%	0.03%
Kendo	0.00%	0.00%	0.00%	-0.22%	0.04%
Newspapercc	0.00%	0.00%	0.00%	-0.12%	0.08%
GhostTownFly	0.00%	0.00%	0.00%	-0.05%	0.08%
PoznanHall2	0.00%	0.00%	0.00%	-0.14%	-0.04%
PoznanStreet	0.00%	0.00%	0.00%	-0.04%	0.10%
UndoDancer	0.00%	0.00%	0.00%	0.04%	0.13%
1024x768	0.00%	0.00%	0.00%	-0.16%	0.05%
1920x1088	0.00%	0.00%	0.00%	-0.05%	0.07%
<b>average</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>-0.10%</b>	<b>0.06%</b>

- Thanks LG for the cross-check (JCT3V-D0299)

# Thank you!