

A placeholder concept and a software development plan for the test model and the core experiment common ground software

JVET-J0087

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Motivation

- We have a successful Call for Proposals (CfP) with responses showing very good coding efficiency.
 - Most proposals have similar block partitioning structures and similar categories of tools.
 - It is desirable to have a common software and establish core experiments (CEs) soon.
 - It took JCT-VC one year to create HM-1.0 during the HEVC standardization period, and before HM-1.0 JCT-VC couldn't conduct any CEs.
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- Can we do better this time?

Proposed Idea

- Select the most common block partitioning structure concept as the **test model**, that is, quadtree plus binary tree and triple tree (QTBT + TT)
- On top of QTBT+TT, add a number of **JEM-7.0 tools** as **placeholders** to the test model and called it the **CE common ground software (CE-SW)**

On Placeholders

- Each placeholder shall be tested together with other proposed changes or replacements in a corresponding future CE.
- The CE anchor shall be generated by disabling the placeholder of the CE.
- In general, the CE anchor enables the rest of placeholders, but further investigations on the interaction between tools in different CEs may be planned in the CE.
- The placeholder list should be decided by the JVET group in this meeting.
- Whether a tool tested in a CE is adopted into the test model shall be decided by the JVET group at the next meeting.

Additional Suggestions for CE-SW

- Remove software associated to unselected tools from the CE-SW
- Control enabling or disabling each selected placeholder through a configuration
- Remove the prediction unit (PU) and transform unit (TU) concepts and the irrelevant high-level syntax (HLS) in HEVC from the CE-SW

Who and When to Build the Software

- Suggest to establish a test model and CE common ground software development Ad-Hoc Group (AHG) to develop the software according to the related decisions made by JVET
- Release the software in 3 or 4 weeks after this meeting
- CE-SW implementation plan
 - Example 1: Begin with JVET-J0075 (HM plus QTBT and nothing else) and add selected JEM-7.0 tools of the approved placeholder list
 - Example 2: Modify JVET-J0035, NextSoftware, to achieve the goal
 - This has to be discussed and decided by the JVET group in this meeting, and a Break-out Group (BoG) can be established for this, if necessary

Initial Placeholder List – Just An Example

- 128x128 CTU with maximum transform size = 128x128
- Intra mode coding with 67 intra prediction modes & 4-tap intra interpolation filter
- CCLM
- ATMVP
- AMVR with 1/16-sample MV storage accuracy
- Affine motion compensation prediction
- BIO
- DMVR
- AMT & NSST
- ALF
- CABAC modifications

Performance of an Example CE-SW

- Just to provide information
- Y/U/V BD-rates = -34.74% / -42.48% / -42.94% for RA

	Constraint Set 1					
	Over HM16.16					
	BD-rate(Y)	BD-rate(U)	BD-rate(V)	BD-PSNR(Y)	BD-PSNR(U)	BD-PSNR(V)
FoodMarket4	-33.54%	-41.20%	-44.84%	1.67	1.17	1.39
CatRobot1	-39.60%	-52.24%	-44.39%	1.55	0.95	1.24
DaylightRoad2	-41.71%	-58.41%	-42.15%	1.14	1.29	0.80
ParkRunning3	-36.04%	-20.62%	-23.19%	1.20	0.34	0.32
Campfire	-39.74%	-30.34%	-51.83%	1.19	1.09	1.61
BQTerrace	-32.76%	-51.10%	-58.81%	0.99	0.96	1.14
RitualDance	-27.08%	-36.24%	-39.99%	1.46	1.04	1.30
MarketPlace	-28.90%	-44.62%	-41.93%	1.02	0.80	0.76
BasketballDrive	-32.14%	-44.23%	-41.10%	1.16	0.97	1.22
Cactus	-35.86%	-45.75%	-41.13%	1.48	0.73	1.07
Average SDR-A	-38.13%	-40.56%	-41.28%	1.35	0.97	1.07
Average SDR-B	-31.35%	-44.39%	-44.59%	1.22	0.90	1.10
Average all	-34.74%	-42.48%	-42.94%	1.29	0.93	1.08
Enc Time[%]	454%					
Dec Time[%]	224%					