

The logo for MEDIATEK, featuring the word "MEDIATEK" in white, uppercase, sans-serif font, centered within an orange parallelogram shape that is wider at the top and tapers towards the bottom.

MEDIATEK

Block Vector Prediction for Intra Block Copying

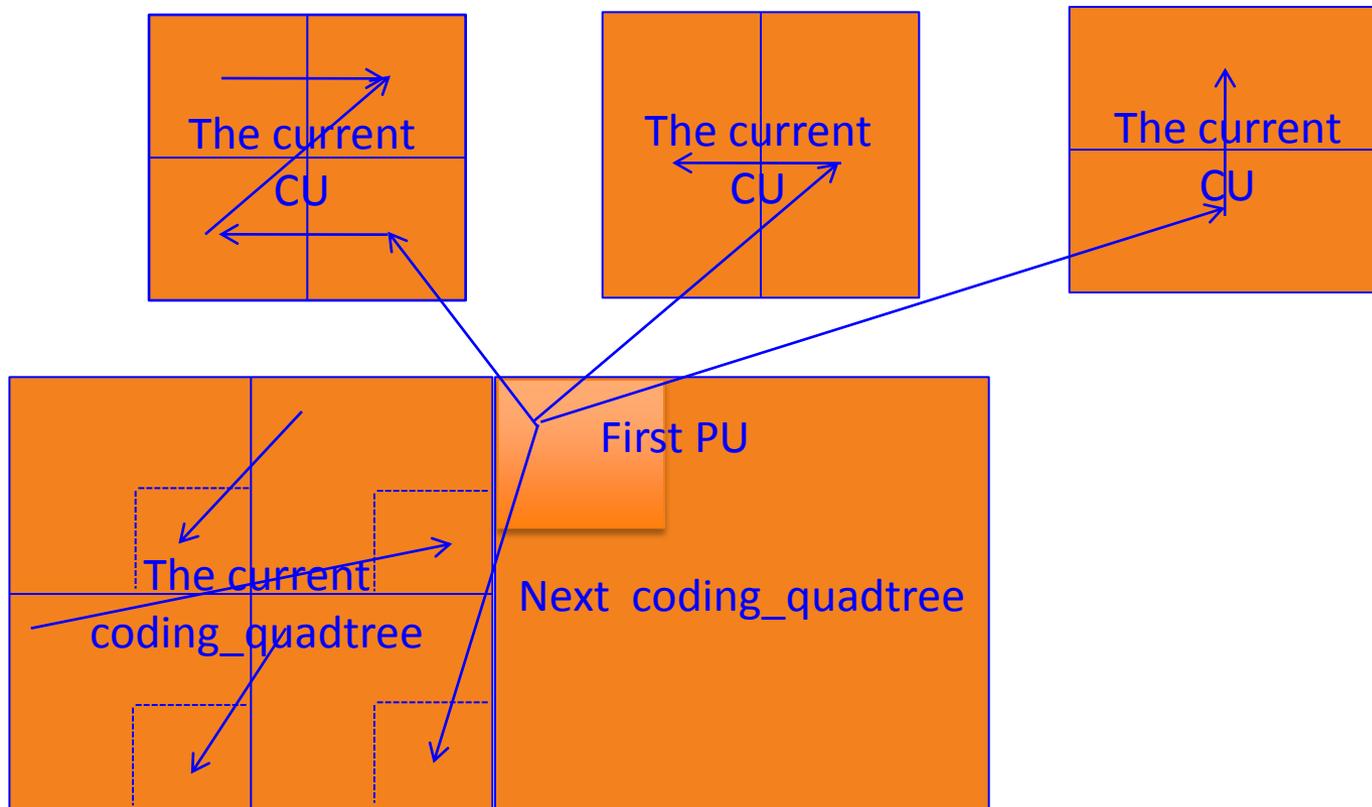
X. Zhang, K. Zhang, J. An, H. Huang, S. Lei
17th JCT Meeting in Valencia
27 March – 4 April, 2014

Outline

- Background
- Problems
- Proposed Method
- Experimental Results

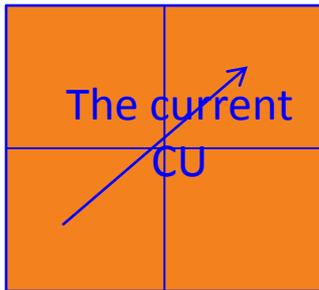
Background

- Current BVP
 - Among PUs

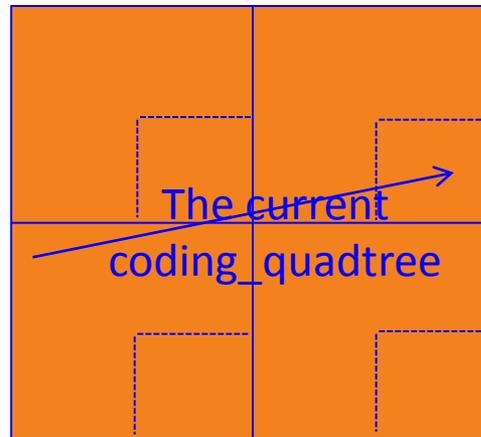


Problems

- The CU or PU with index=2 has an BVP from the one with index=1.
 - They are not neighboring blocks.



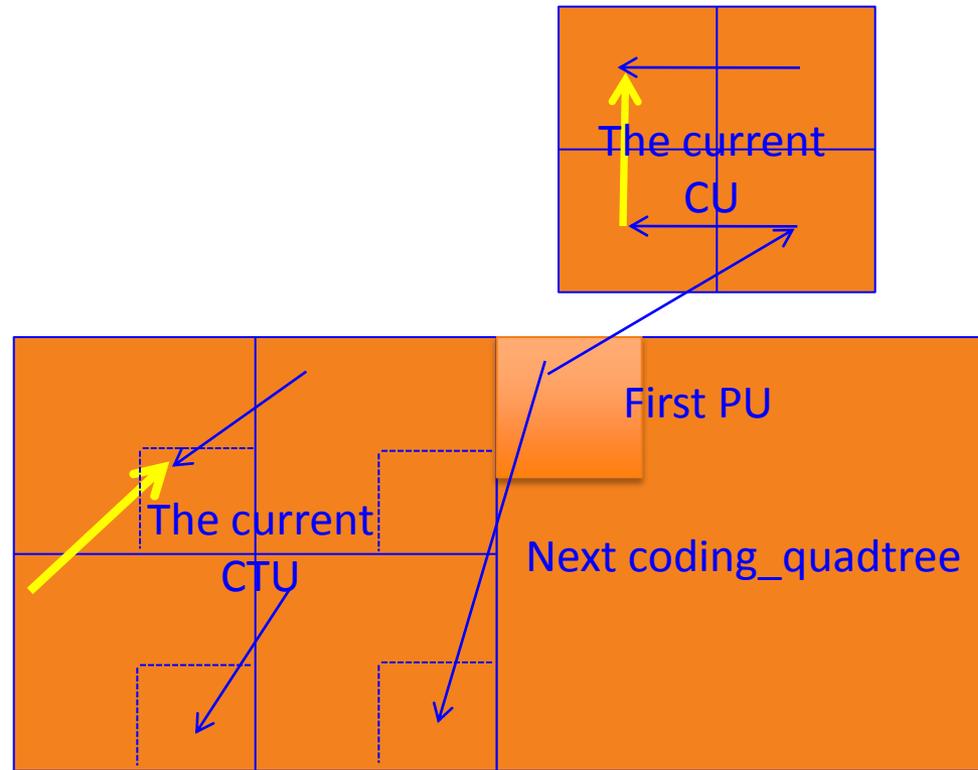
An IBC CU with
N×N partitioning



Bottom-left IBC CU (index = 2), BVP from the last
PU in the upper-right IBC CU (index = 1)

Proposed Method

- Proposed Modification
 - Among PUs (IBC CU with N×N partitioning)
 - Among CUs



Proposed Method

- Complexity
 - No additional buffers are required
 - The modification is not to cover the lastBCMV after decoding the CU or PU with index=1

Experimental Results AHG8_CTC

| | All Intra Main-tier | | | All Intra High-tier | | | All Intra Super-High-tier | | |
|---------------------------|-------------------------|-------|-------|-------------------------|-------|-------|---------------------------|-------|-------|
| | Y | U | V | Y | U | V | Y | U | V |
| Class F | -0.1% | 0.0% | -0.1% | -0.1% | 0.0% | -0.1% | -0.1% | -0.1% | -0.1% |
| Class B | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB 4:4:4 SC | -0.1% | -0.2% | -0.2% | -0.1% | -0.2% | -0.2% | -0.1% | -0.2% | -0.2% |
| RGB 4:4:4 Animation | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| YCbCr 4:4:4 SC | -0.2% | -0.2% | -0.3% | -0.2% | -0.1% | -0.2% | -0.2% | -0.1% | -0.2% |
| YCbCr 4:4:4 Animation | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| RangeExt | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| RGB 4:4:4 SC (Optional) | -0.1% | -0.2% | -0.2% | -0.1% | -0.2% | -0.3% | -0.2% | -0.1% | -0.2% |
| YCbCr 4:4:4 SC (Optional) | -0.3% | -0.2% | -0.2% | -0.3% | -0.2% | -0.2% | -0.2% | -0.2% | -0.2% |
| Enc Time[%] | 100% | | | 100% | | | 100% | | |
| Dec Time[%] | 99% | | | 100% | | | 100% | | |
| | Random Access Main-tier | | | Random Access High-tier | | | | | |
| | Y | U | V | Y | U | V | Y | U | V |
| Class F | -0.1% | 0.1% | 0.1% | -0.1% | 0.0% | 0.0% | | | |
| Class B | 0.0% | 0.1% | 0.0% | -0.1% | 0.0% | 0.0% | | | |
| RGB 4:4:4 SC | -0.2% | -0.1% | -0.1% | -0.1% | -0.1% | 0.0% | | | |
| RGB 4:4:4 Animation | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| YCbCr 4:4:4 SC | 0.0% | 0.0% | 0.1% | 0.0% | 0.1% | 0.1% | | | |
| YCbCr 4:4:4 Animation | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| RangeExt | 0.0% | 0.0% | -0.1% | 0.0% | 0.0% | 0.0% | | | |
| RGB 4:4:4 SC (Optional) | -0.1% | -0.1% | -0.1% | 0.0% | 0.0% | -0.1% | | | |
| YCbCr 4:4:4 SC (Optional) | -0.2% | -0.1% | -0.1% | -0.2% | -0.3% | -0.3% | | | |
| Enc Time[%] | 100% | | | 100% | | | | | |
| Dec Time[%] | 101% | | | 101% | | | | | |
| | Low delay B Main-tier | | | Low delay B High-tier | | | | | |
| | Y | U | V | Y | U | V | Y | U | V |
| Class F | -0.1% | 0.2% | 0.2% | 0.0% | -0.1% | 0.1% | | | |
| Class B | 0.0% | -0.4% | 0.0% | 0.0% | -0.2% | 0.0% | | | |
| RGB 4:4:4 SC | 0.2% | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | | | |
| RGB 4:4:4 Animation | -0.1% | 0.0% | -0.1% | -0.1% | 0.0% | 0.0% | | | |
| YCbCr 4:4:4 SC | -0.1% | -0.2% | -0.3% | -0.2% | -0.3% | -0.4% | | | |
| YCbCr 4:4:4 Animation | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| RangeExt | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | | | |
| RGB 4:4:4 SC (Optional) | -1.7% | -1.8% | -1.8% | -1.1% | -1.0% | -1.1% | | | |
| YCbCr 4:4:4 SC (Optional) | -0.3% | -0.3% | -0.2% | -0.6% | -0.6% | -0.4% | | | |
| Enc Time[%] | 100% | | | 100% | | | | | |
| Dec Time[%] | 100% | | | 100% | | | | | |

Experimental Results SCC_CFP

| | All Intra | | |
|---|-----------|-------|-------|
| | Y | U | V |
| RGB, text & graphics with motion, 1080p | -0.2% | -0.2% | -0.2% |
| RGB, text & graphics with motion, 720p | -0.1% | -0.2% | -0.2% |
| RGB, mixed content, 1440p | -0.1% | -0.1% | -0.1% |
| RGB, mixed content, 1080p | -0.1% | -0.1% | -0.1% |
| RGB, Animation, 720p | 0.0% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | -0.2% | -0.2% | -0.2% |
| YUV, text & graphics with motion, 720p | -0.1% | -0.2% | -0.3% |
| YUV, mixed content, 1440p | -0.1% | -0.1% | -0.1% |
| YUV, mixed content, 1080p | -0.1% | -0.1% | -0.1% |
| YUV, Animation, 720p | 0.0% | 0.0% | 0.0% |
| Enc Time[%] | 100% | | |
| Dec Time[%] | 98% | | |

| | Random Access | | |
|---|---------------|-------|-------|
| | Y | U | V |
| RGB, text & graphics with motion, 1080p | -0.1% | -0.1% | -0.1% |
| RGB, text & graphics with motion, 720p | 0.0% | 0.0% | 0.0% |
| RGB, mixed content, 1440p | -0.1% | 0.0% | -0.1% |
| RGB, mixed content, 1080p | 0.0% | 0.0% | 0.0% |
| RGB, Animation, 720p | 0.0% | -0.1% | 0.0% |
| YUV, text & graphics with motion, 1080p | -0.2% | -0.2% | -0.2% |
| YUV, text & graphics with motion, 720p | -0.1% | -0.2% | -0.1% |
| YUV, mixed content, 1440p | -0.2% | -0.1% | 0.1% |
| YUV, mixed content, 1080p | -0.2% | -0.2% | -0.2% |
| YUV, Animation, 720p | 0.1% | -0.1% | -0.2% |
| Enc Time[%] | 99% | | |
| Dec Time[%] | 98% | | |

| | Low delay B | | |
|---|-------------|-------|-------|
| | Y | U | V |
| RGB, text & graphics with motion, 1080p | -0.1% | -0.1% | -0.1% |
| RGB, text & graphics with motion, 720p | 0.2% | 0.0% | 0.0% |
| RGB, mixed content, 1440p | -0.1% | -0.2% | -0.1% |
| RGB, mixed content, 1080p | -0.1% | -0.1% | -0.1% |
| RGB, Animation, 720p | -0.1% | 0.0% | 0.0% |
| YUV, text & graphics with motion, 1080p | 0.2% | 0.2% | 0.3% |
| YUV, text & graphics with motion, 720p | -0.1% | -0.2% | -0.5% |
| YUV, mixed content, 1440p | -0.1% | -0.5% | 0.1% |
| YUV, mixed content, 1080p | 0.0% | -0.1% | 0.1% |
| YUV, Animation, 720p | 0.0% | -0.1% | 0.1% |
| Enc Time[%] | 100% | | |
| Dec Time[%] | 96% | | |