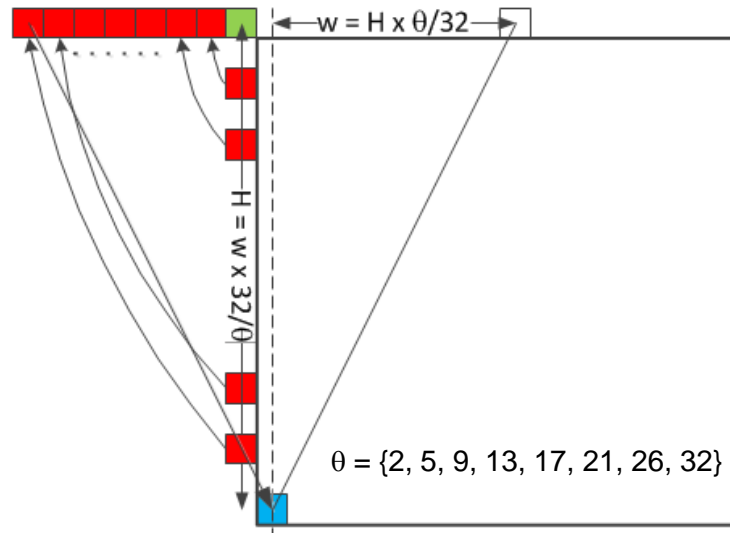JCTVC-G738
On angular intra prediction main array extension

Muhammed Coban

Intra prediction main array extension

$\theta = \{2, 5, 9, 13, 17, 21, 26, 32\}$

$w = H \times \theta/32$

$H = w \times 32/\theta$

- Extend main array by use of sub-sampled side reference samples
- HM-4.0 Sub-sampling positions are computed using 12-bit slope table:

  invAngle = round($256*32/\theta$) = {4096, 1638, 910, 630, 482, 390, 315, 256}

  s[-1+((x*invAngle+128)>>8)],   x=(nS*intraPredAngle)>>5...-1

  where s is the side reference array

- Propose use of simpler 8-bit slope table:

  invAngle = 16*32/θ = {256, 102, 56, 39, 30, 24, 19, 16}

  s[-1+((x*invAngle+8)>>4)],   x=(nS*intraPredAngle)>>5…-1

- Negligible change in BD rate.

Qualcomm
CDMA Technologies

Results (HM 4.0 Anchor)

	All Intra HE			Low delay B HE			All Intra LC			Low delay B LC		
	Y	U	V	Y	U	V	Y	U	V	Y	U	V
Class A	0.00%	-0.03%	0.02%				0.00%	0.04%	0.01%			
Class B	0.01%	0.02%	0.02%	0.03%	-0.03%	-0.38%	0.00%	0.00%	0.00%	0.01%	-0.03%	0.04%
Class C	0.00%	0.00%	0.00%	0.02%	0.08%	-0.09%	0.00%	-0.02%	0.01%	-0.01%	0.26%	-0.18%
Class D	0.00%	0.00%	-0.02%	0.05%	0.45%	-0.25%	0.00%	0.00%	-0.02%	-0.02%	0.27%	0.05%
Class E	0.01%	-0.01%	0.04%	0.03%	0.09%	0.04%	0.00%	0.00%	0.01%	-0.11%	0.12%	0.30%
Overall	0.00%	0.00%	0.01%	0.03%	0.14%	-0.20%	0.00%	0.00%	0.00%	-0.03%	0.14%	0.04%
	0.00%	-0.01%	0.00%	0.03%	0.18%	-0.23%	0.00%	0.00%	0.00%	-0.03%	0.14%	0.05%
Enc Time[%]	100%			100.36%			99%			100.27%		
Dec Time[%]	96%			95%			94%			97%		

	Random Access HE			Low delay P HE			Random Access LC			Low delay P LC		
	Y	U	V	Y	U	V	Y	U	V	Y	U	V
Class A	0.00%	-0.18%	0.28%				0.01%	0.22%	0.66%			
Class B	0.00%	-0.01%	-0.09%	0.03%	-0.10%	-0.02%	0.01%	-0.04%	0.11%	0.02%	0.09%	-0.10%
Class C	0.01%	-0.12%	0.05%	0.00%	0.24%	0.07%	-0.02%	-0.03%	0.09%	-0.01%	0.16%	-0.02%
Class D	0.02%	-0.02%	0.00%	0.01%	-0.16%	-0.14%	-0.02%	-0.03%	0.04%	0.03%	-0.13%	-0.16%
Class E				-0.02%	-0.13%	-0.58%				0.01%	-0.51%	-0.30%
Overall	0.01%	-0.08%	0.05%	0.01%	-0.03%	-0.13%	0.00%	0.03%	0.22%	0.01%	-0.06%	-0.13%
	0.01%	-0.09%	0.05%	0.01%	-0.03%	-0.14%	0.00%	0.03%	0.19%	0.01%	-0.08%	-0.16%
Enc Time[%]	100%			102%			99%			101%		
Dec Time[%]	96%			94%			95%			93%		