Detection for All Zero Coefficient Blocks in HEVC based on Uniform Quantizer

MMBD1186

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Introduction

The detecting all zero coefficient blocks algorithm is based on determining the quantization level (QL) for the global maximum magnitude (MM). The estimated global MM is used to detect all zero coefficient blocks (AZCB) and non-all zero coefficient blocks (non-AZCB). AZCB can be easily detected by comparing the float QL (FQL) of the coefficients with the threshold.

Methods

- The global MM of DCT coefficients is estimated and its FQL will be compared with Th_U
- Low frequency coefficient is estimated and the corresponding FQL is compared with Th_U
- If Th_U is larger than FQL, the corresponding TB is an AZCB, otherwise. it is a non-AZCB

Graphics / Images

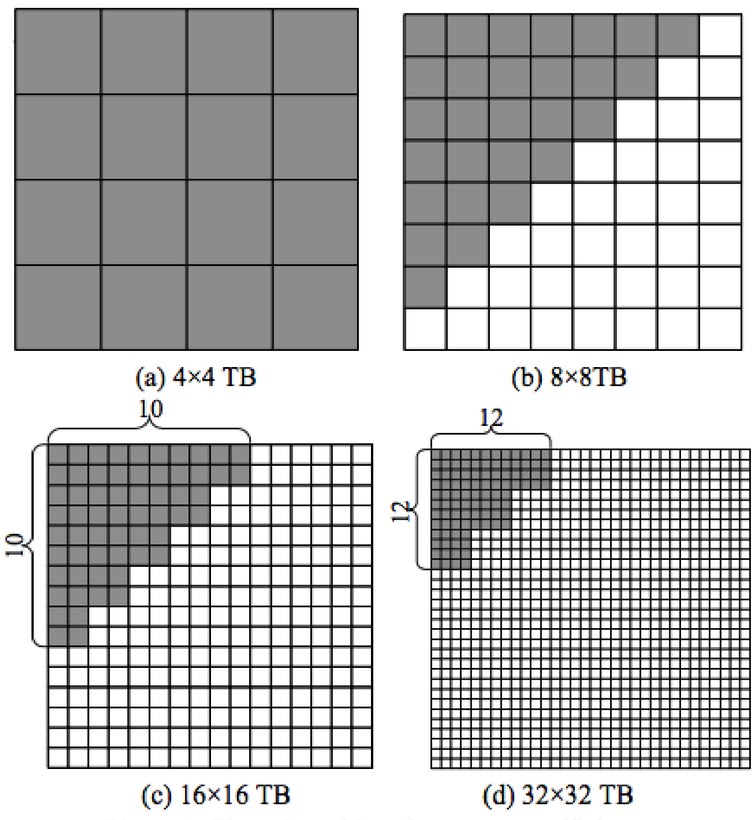

Figure 1. The selected low frequency coefficients

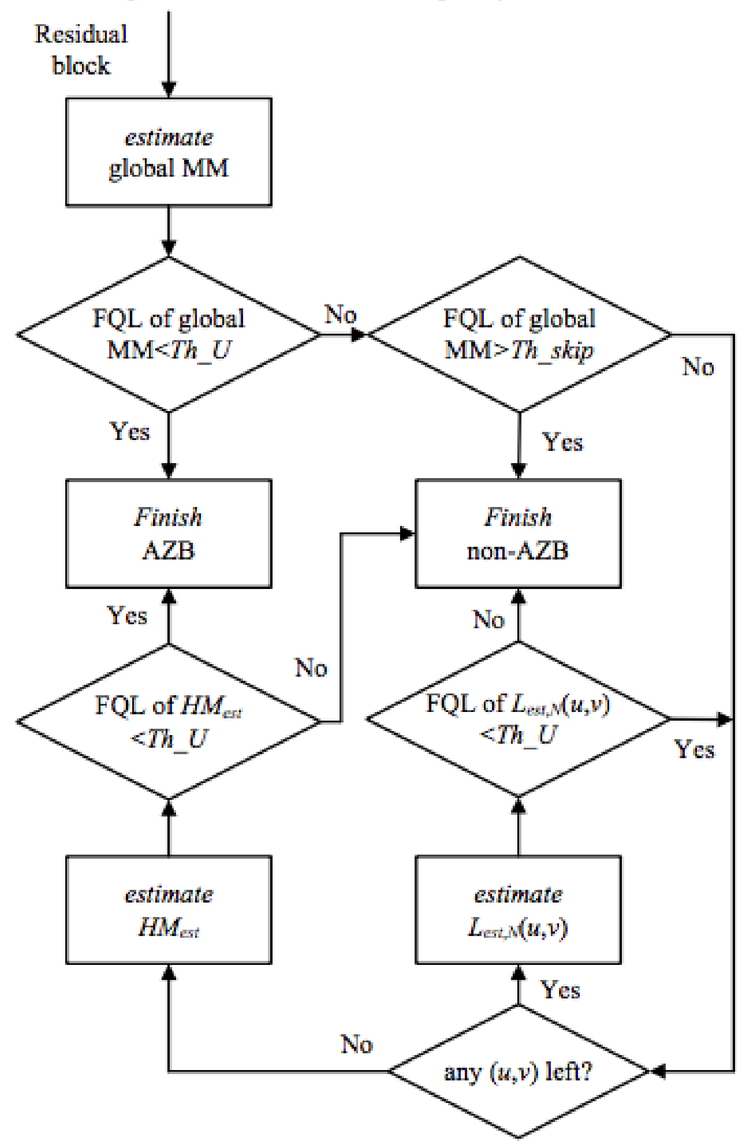

Figure 2. The flowchart of AZCB detection in UQ

Table 1. The Results for UQ AZCB Detection

Sequence	BDBR (%)	BDPSNR (dB)	TS (%)
PeopleOnStreet	-0.04	0.002	44
Traffic	-0.15	0.005	50
BasketballDrive	0.09	0.000	44
BQTerrace	-0.07	0.001	51
Cactus	-0.09	0.002	48
Kimono	-0.07	0.002	42
ParkScene	0.03	-0.001	53
BasketballDrill	0.09	-0.004	49
BQMall	-0.06	0.003	44
PartyScene	-0.03	0.002	41
RaceHorsesC	-0.05	0.002	36
BasketballPass	0.00	-0.001	43
BlowingBubbles	0.14	-0.005	41
BQSquare	0.13	-0.005	50
RaceHorsesD	0.02	-0.002	36
FourPeople	0.11	-0.006	64
Johnny	-0.04	-0.001	69
KristenAndSara	0.12	-0.003	65
ChinaSpeed	-0.09	0.005	51
SlideEditing	-0.07	0.010	69
SlideShow	0.10	-0.007	63
Average	0.00	0.000	50

Conclusions

An AZCB detection algorithm for UQ is proposed in this paper. The algorithm adopts a low and high frequency coefficients separation strategy to estimate transform coefficients. Threshold to determine AZCB in UQ can be deduced. Experiment results show that the proposed algorithm can reduce the computation complexity while keeping nearly the same BDBR and BDPSNR with the original algorithm in HEVC.