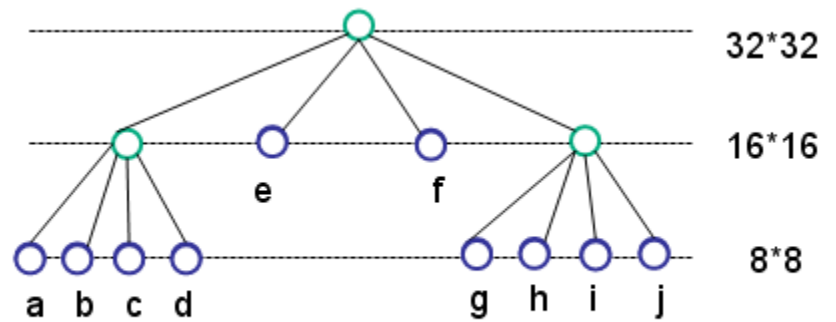# Threshold Relax and Coefficient Approximation Based Dual-threshold All-Zero Block Detection for HEVC

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■ Research background

HEVC (High Efficiency Video Coding):

1. Reducing bitrate 50% with comparable image quality compared to H.264 AVC High Profile.

2. Transform Quad-tree is applied leading to huge complexity.

Example of 3 depth transform quad-tree
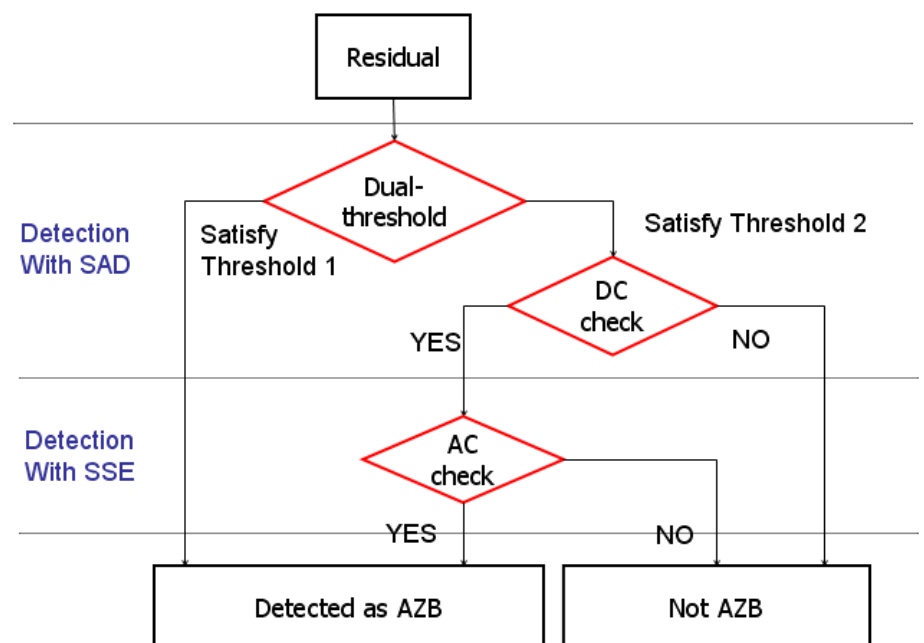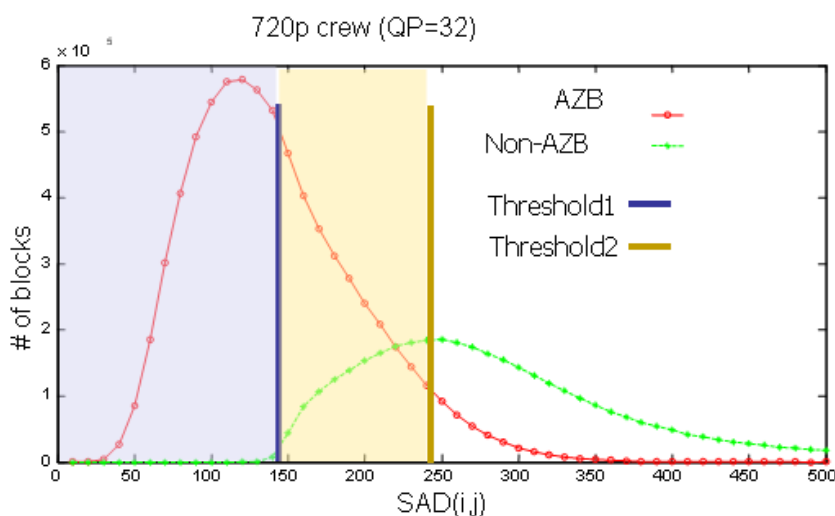
■ Problem statement

Previous single threshold method of All Zero Block detection is able to reduce the complexity but the detection rate is not satisfying.
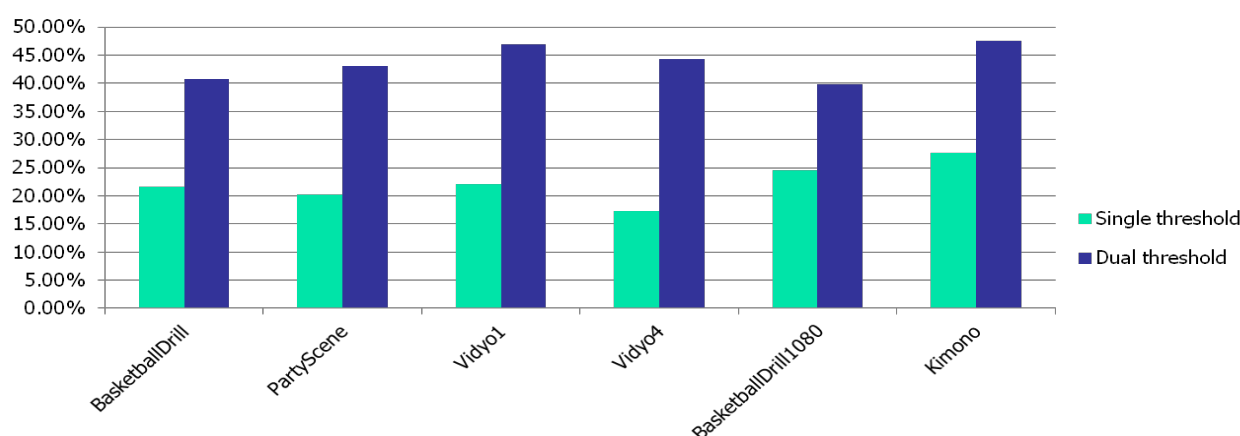
■ Proposed method

Apply two thresholds to solve the problem 1. Decision of threshold 2 Threshold 2=(QP+10)/30*Threshold 1

2. Precise Detection with DC and AC

$$DC = \frac{1}{N}\sum_0^{N-1}\sum_0^{N-1} X_{ij}$$

$$AC^2 < Qstep^2$$

■ Result

■ Conclusion

In average, detection rate increases 15% than singlethreshold. Timesaving reaches 40%.