I. Motivations

- High Efficiency Video Coding (HEVC): 40% bitrate savings when compared to the widespread H.264/AVC standard.
- Most frequent approach to reduce the complexity: reduce the optimize coding–tree search.

Contribution: method to efficiently allocate the computational complexity among CTU in an Intra encoded frame: “Constrain the Docile CTUs” (CDC).

III. Impacts of a CTU constraint on the RD–Cost

- Absolute RD–cost per CTU of the first frame of BQTerrace (1080p)
  - Red blocks: the 20% of the CTUs with the lowest RD–Costs.
  - Black blocks: the 20% of the CTU with the highest RD–Costs.

- Relative RD–cost increase per CTU under constraint of the first frame of BQTerrace (1080p)
  - The constraint: remove the last depth of the quad–tree.

CTUs with lowest RD–Cost have less increase of bit rates and/or distortion than CTUs with high RD–Cost when constrained.

IV. Temporal RD–Cost stability

- Average correlation coefficient of CTU RD–Costs of consecutive frames

V. The CDC Complexity Allocator

- Proposed in frame complexity allocator: Constrain the Docile CTUs (CDC)
  - When CTUs have to be constrained, apply the constraint on CTUs with the lowest RD–Costs of the previous frame.
  - Can be adapted to different CTU complexity reduction techniques.
  - “Constrain the Docile CTUs”: consists of reducing the encoding effort for the CTUs that lend themselves the most to encoding.

VI. Experimental Results

- CDC allocator evaluation: BD-rate between the CDC and four methods of allocating when the constraint is to remove the last depth level in the RDO process:
  - Upper: the first CTUs in the raster scan order of the frame are constrained.
  - Lower: the last CTUs in the raster scan order of the frame are constrained.
  - Tick: every CTU out a percentage is constrained.
  - Inverse: the exact inverse of our allocator method, i.e. the CTUs with the highest RD–Cost in the previous frame are constrained.

- BD–rate between our allocator (CDC) and four others (in %)

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