

# Effect of Saturation Arithmetic on Sum of Absolute Difference (SAD) Computation in H.264

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# Motion Estimation

- Block matching between successive frames – video compression
  - Find the best matching block (Motion Vector)
    - Motion vector will be used to reproduce the reference frame
  - Motion vectors are found by calculating minimum SAD

1. 
$$SAD(x, y, r, s) = \sum_{i=0}^{l-m} \sum_{j=0}^{l-n} |A_{(x+i, y+j)} - B_{((x+r)+i, (y+s)+j)}|$$
2. 
$$MV(r, s) = \operatorname{argmin}[SAD(x, y, r, s)]$$

# Motion Estimation – SAD

- SAD Computation
  - Compute  $(A_i - B_i)$  for all  $16 \times 16$  pixels in the two blocks A and B
  - Determine which  $A_i - B_i$  is less than zero and produce the absolute value in that case, else produce  $A_i - B_i$
  - Perform accumulate operation to all  $16 \times 16$  absolute values.