SEARCH WINDOW ESTIMATION ALGORITHM FOR FAST AND EFFICIENT H.264 VIDEO CODING WITH VARIABLE SIZE BLOCK CONFIGURATION (WedPmOR5)

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Abstract:
Today there are new high band requests from actual multimedia services, and efficient video coders are needed in order to obtain a sensible reduction of video streams band occupation, maintaining video quality. The new video coding standard H.264 seems to be answer to fulfill these requirements. On the other hand, the H.264 encoder complexity is largely increased, if compared with previous standards, mainly because of the high computational cost of the Motion Estimation module. In this paper, we propose an innovative algorithm for reducing the complexity of the Motion Estimation (ME) module. The main idea is to make dynamically modifiable a previously static H.264 coder parameter: the size of the search window in motion estimation. A Motion Detection module has been added to the video coder in order to compute the search window size. Detailed motion estimation is performed only when and where it is required.

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In the proposed solution, a reduction in the number of calculated SAD (Sum−of−Absolute−Differences) allows decreasing the encoder complexity, especially in low complex sequences.

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Abstract: H.264 has been used for validating the proposed approach; this paper shows the behavior of the Search Window Estimation (SWE) algorithm using different H.264 macroblock configurations.