

ABSTRACT

Video watermarking is a digital data insertion technique in the form of text, image or video into a digital video, where its presence is not visible to the human eye. The development of watermarking techniques in digital data in the form of video goes hand in hand with the growing need for video copyright protection. Imperceptibility, resilience and security of watermarks against various attacks is the most important problem to be solved. Generally only one watermark is inserted in an H.265 / HEVC codec-based digital video as a copyright mark or as data authentication.

This final project, a simulation program is made for a binary image watermarking system integration in H.265 video compression using the Discrete Wavelet Transform (DWT) algorithm. In the embedding process, the least significant bit (LSB) insertion technique and the spread spectrum method will be used using a random number pattern generated by a pseudo random number (PRN) sequences generator to increase the security of the watermark image on the video.

Based on the simulation results, the effect of video type on the watermarking process has the highest PSNR value on the VGA video footage type with slow objects that is 15,967 dB. The influence of the length of the pseudo number (PN) which produces the highest PSNR value on each test video is 128 bits. The effect of the subband as the insertion container is obtained the highest PSNR value if the watermark is inserted in the LH subband. The effect of the quantization parameter (QP) on the compression process that produces video can still be seen and does not interfere with the values of $QP = 5$ and $QP = 10$. Whereas the extracted watermark images for all tests obtain $BER = 0$, $PSNR = \infty$ dB, detection rate (DR) = 100%, and SSIM = 1.

Keywords: watermark, H.265 / HEVC, DWT, LSB, PRN Sequences