

## Abstract

The increase in criminal activity makes people use various surveillance techniques to create a sense of security. One commonly used surveillance technique is installing CCTV cameras in several places. CCTV does not stand alone but has other supporting devices. The recording device on CCTV has 2 modes: continuous and motion detection. The constant mode will record continuously, which impacts hard disk capacity running out quickly. The motion detection mode only records an event so that the hard disk capacity does not run out quickly, but not all recordings can be viewed. Based on these two modes, a compression technique is needed.

This study aims to modify the region-based video compression algorithm of moving objects on video surveillance systems using 5 methods, namely lossless video compression in AVI and MJPEG 2000 video compression formats, and lossy video compression in AVI, MJPEG 2000, and MPEG-4 compression video formats, so that can reduce the size of the video data volume. The stages in this research consist of 2 stages. The first is the video compression stage which consists of object detection, the ROI (Region of Interest) method, the cropping process, and the frame cropping compression process. The second stage is the decompression stage of AVI, MJPEG 2000, and MPEG-4 video compression which has been applied with the ROI method to return to the original video.

Compared to the currently used method, the proposed ROI-based compression method can increase the compression ratio. Comparison of compression ratios for all methods measured at the same compression quality on 6 test video data. The ROI-based AVI method increases the compression ratio between 5 to 25 times higher than the standard AVI method in the lossy compression format. The compression ratio increase is 7 to 40 times greater for ROI-based MJPEG-2000 than standard MJPEG-2000. Finally, ROI-based MPEG-4 managed to increase the compression ratio between 2 to 6 times higher than standard MPEG-4. Furthermore, ROI-based AVI can increase the compression ratio between 16 to 67 times higher than standard AVI in lossless compression formats. ROI-based MJPEG-2000 can increase the compression ratio by 7 to 31 times greater than the standard MJPEG-2000. The PSNR value for lossy compression has a value above 40 dB which indicates that the resulting video quality is visually similar to the original video, even though the pixel values have changed slightly. In lossless compression, the PSNR value is infinity; this means that all pixels in the video do not change during the compression process.

Key words: Kompresi Video, ROI, Video Surveillance Systems, AVI, MJPEG 2000, MPEG-4