# ABSTRACT

Security surveillance system using a camera CCTV (Close Circuit Television) is an important technology to support the security and surveillance system somewhere remotely. CCTV cameras are widely used in industrial shops, apartments, and offices. CCTV cameras are very prominent as evidence over the crime. However the use of CCTV cameras does not effectively and efficiently if placed in an empty room without any movement and activity. This will cause the waste of memory in the data storage. Thus, developing a science in the field of security, I.e the detection of motion.

The author uses IP camera as a CCTV camera. On the IP camera motion detection system will be implemented, so it is with motion detection can detect every movement who was captured by the IP camera. The mocve was made reference to start and end the recording process. If IP camera don't detect movement then the cameras only monitor without doing the recording. A recording of the IP camera will be saved and sent to the cloud so that users can view it wherever he's been. In this final task, the author uses the Sobel algorithm as a method of motio detection. Frames generated by Sobel algorithm will be compared to the previous frame. If there are any pixels that differ between the two frames, then the motion will be called y the system. The steps that are used to detect motion, I.e pre-processing, Sobel operator, frame difference, morphology of the image.

The results of the implementation of motion detection on IP camera on this final project has managed to detect motion. Video input from the IP camera and motion detection results have also been successfully saved and sent to the cloud. The test results of this motion detection system produces the accuracy of 83.5%, the TPR of 0.75, FPR amounted to 0.02, the F1 score of 0.83.

**Keywords :** Motion Detection, Sobel Operator, Edge Detection, CCTV, IP Camera, Cloud Storage.