

ABSTRACT

Most of the smoke detection system in the room nowadays use sensor that require to capture particles first before getting an indication of the captured particles. This system will take a long time for outdoors utilization. To overcome this problem, there are many researchs that make smoke detection systems using video that is more guarantee to provide the latest information.

This research detects the presence of the smoke in the video using digital image processing. The techniques used are CIE LAB color space, K-means, background subtraction, and naive bayes. K-means is used to segmenting the smoke colors with the non-smoke colors. Background subtraction is used to separating objects that are not moving with the moving object, because the smoke is a moving object in the video. The system requires classification to distinguish smoke and non-smoke objects, therefore naive bayes is used to classify the color of the smoke contained in the video.

This research using 35 videos, 25 videos are used to data training and 10 videos are used to data testing. Each video will be extracted to 125 frames. Other parameters are changes in resize size, color space, number of k, statistical characteristics, and amount of data. In this research, the output generated by system can recognize smoke objects on the video with an average accuracy of 80% with an average computation time of 40.8 seconds.

Key words : *Smoke Detection, Color Space, K-means, Background Subtraction, Naive Bayes.*