

## **ABSTRACT**

Fire is one of disaster that often happens in the daily life. Some of preventive action that usually conducted is by using smoke or heat detector. Nowadays, fire detection system can be deployed on CCTV. Some methods has been developed to detect fire on the video file, with the main focus is to extract the fire features such as color and moving pattern, so the accuracy can be increased and can accelerate the process. Some of research based on the serial filtering principle on the detection step. It makes the detection process become time consuming. To accelerate the process, it needs a new approach to analyze the fire features from spatial and temporal domain in the same time.

One of the feature extraction method on the dynamic texture domain is able to produce object features on the video that represents spatial and temporal features at once. The method is LBP-TOP (Local Binary Pattern-Three Orthogonal Plane). LBP-TOP can produce spatial and temporal features from object in video by analyzing three planes: XY(spatial), XT and YT(temporal). The fire features produced by LBP-TOP was modeled by using clustering K-Means method as the reference model when the classification process was done by using K-NN method. By using LBP-TOP as the feature extraction method, K-Means as the modeling feature, and K-NN as the classifier, the accuracy of the detection process can reach 92% with less complexity.