

ABSTRACT

Fire Fighting robot is a tool that serves to help human extinguish the fire, where fire is rapid oxidation process against a material that has the shape of light (color) with wavelength and heat. The characteristics of the fire can be used as parameters for fire detection applied to UVTRON, thermal, and other fire sensor circuits. Another option to detect fire with fire sensor circuit, one of the characteristics on fire that is color, can be detected with camera processed through the OpenCV library.

In the previous fire fighting robot design, the fire detection technique used was the combination of UVTRON and thermal fire sensors. Where UVTRON detects fire with its typical wavelength and thermal detects with fire temperature. The integration of these two sensors works with UVTRON as the detection of presence or no fire in the room, because the output of UVTRON is only digital 0 or 1. While thermal as the determinant that fire point is already in front of the robot, with thermal output is I2C. The detection technique of combining these 2 sensors is quite effective, but due to the narrow thermal detection range cause the robot to sometimes miss the point of fire. This can be overcome by adding a camera image detection system that allows the robot to determine precisely the position of the fire point.

In this final project, writer combine the fire sensor circuit with the camera and see the comparison when only using a series of fire sensors only, and combine the camera with fire sensors. So that found a way that has more accurate fire detection, and quickly in finding and turning off the fire. The research on this final project has succeeded in creating a system that combines image processing and fire sensors in which the accuracy of fire extinguish is much better that is 86.67% compared to only flame sensor which has 80% accuracy level. And has a fire extinguish speed with almost the same time, where the PWM used robot for 90 in each test.

Key Word : UVTRON, Thermal, Color Detection, Image processing, PWM, OpenCV.