

## ABSTRACT

Natural disaster is a disaster caused by events or a series of events caused by nature. Natural disasters can also damage buildings so that in the aftermath of natural disasters such as earthquakes, landslides, tsunamis, and others, land-based search routes are impeded due to unstable ground and difficult terrain that is inaccessible to the search and rescue (SAR) team. This research outputs a life-detection system for disaster victims. The purpose of this research is to make it easier for the search and rescue team to evacuate victims.

This research uses Mask Region-Based Convolutional Neural Networks (Mask R-CNN) as a method of object feature classification in recognizing disaster victims. After the disaster victims are detected, the system will detect chest, abdominal, and back movements through ROI (Region of Interest).

The process of detecting natural disaster victims is done using Mask R-CNN. The dataset used contains 100 images of the human class that have been labeled on Roboflow. The best model used by the researcher used a learning rate of 0.01; 100 epochs; and step epochs of 1000, resulting in the best research results with TP value of 104, FN value of 12, FP value of 29, Precision of 78%, Recall of 89%, F1 score of 83%, and FNR of 10.3%. This system will detect human objects using the best model and then detect any movement of the chest, abdomen, or back of the object built through RoI Openpose. Inside RoI Openpose, it can detect signs of life using Motion Detection. The motion detection method used by the researcher is the Image Difference method. If the absdiff value is  $\geq 50000$ , it is considered alive, otherwise, if it is  $\leq 50000$ , it is declared not alive. The value of 50000 absdiff is the limit of the value change based on the researcher's experiment in comparing humans and mannequin.

**Keywords :** *Mask R-CNN, Open Pose, ROI.*