

## **ABSTRACT**

*Hand gesture with human-computer interaction approach plays an important role in machine interaction. Many applications are developed using gestures, some of which are the control of household appliances, robots, and others. However, there are problems on implementation such as the use of glove-based hand gestures using sensors that cause skin damage to users with sensitive skin. This research aims to implement deep learning-based hand gesture detection for prototype elevator control, thus avoiding the use of glove sensor-based hand gestures. On implementation, the hand gesture is captured by the camera and then processed by one of the deep learning models is YOLOv4 for detect the hand gesture, If the hand gesture is successfully detected, it sends a signal to the elevator prototype to move floors corresponding class. This research uses a dataset with three types of classes namely lantai 1, lantai 2, and lantai 3 with a total of 3600 images that have been augmented. The dataset was trained with four training schemes, each training schemes has different parameter configurations. The evaluation metrics that is mean average precision (mAP). The highest mAP value is 100.00% by using configuration parameter of learning rate 0.00261, batch 64, subdivision 16, network size, 416, max batch 6000, filters 24. In the hand gesture detection testing, the model was successfully implemented to control the prototype elevator using the camera directly and can detect hand gestures at maximum distance of approximately 0.5 meters.*

**Keywords:** *hand gesture, object detection, deep learning, YOLOv4, human-computer interaction.*