

Abstract

Rapid technological innovation has a significant impact on many industries, including the military. Technology is critical in tackling logistical difficulties in the military context. For example, the use of unmanned ground vehicles (UGVs) equipped with artificial intelligence, which includes skills such as obstacle avoidance, object detection, and navigation, dramatically reduces the risk to human life during logistics delivery missions. Nonetheless, research on object detection for unmanned aerial vehicles (UAVs) participating in military logistics operations on the battlefield is sparse. Object detection is critical for unmanned systems, and this capacity can be done by utilizing several object detection algorithms that have been developed. The goal of this study is to compare the performance of two two-stage detection algorithms: Mask R-CNN and Faster R-CNN. To do this, we use a computer-based simulation approach and numerous datasets from the military domain. The factors compared include average precision, recall, and detection speed. Based on the simulation findings, Mask R-CNN outperforms other models in terms of average precision and recall. Faster R-CNN, on the other hand, outperforms in terms of detection speed and accuracy.

Keywords: Faster R-CNN, Mask R-CNN, logistic, military