Abstract

Drones are currently being used in a wide range of useful tasks that are too dangerous or/and expensive to be performed by humans. However, this is increasingly developing security breaching issues due to the possibility of misuse of unmanned aircraft in illegal activities such as drug smuggling, terrorism, etc. Thus, the detection and tracking of drones are becoming a crucial topic. Unfortunately, due to the drone's small size, its detection methods are generally unreliable: high false alarm rate, low accuracy rate, and low detection speed are well-known aspects of this detection. The new emerging realtime algorithm based on the improved "You Only Look Once" (YOLO-V3) algorithm is proposed here for drone detection. This newly designed algorithm comprises multiple phases and has shown the potential to outperform the traditional detection approaches. The proposed algorithm enhances the performance of YOLO-V3 by designing and building a CNN to solve the problem of a large number of YOLO-V3 parameters, using densely connected modules to enhance the interlayer connection of CNNs and further strengthen the connection between dense neural network blocks, and finally improving the YOLO-V3 multiple-scale detection by expanding the three-scale to four-scale detection to increase the accuracy of detecting small objects like drones. The evaluation results of our algorithm obtain 96% on average precision and 95.60% accuracy.