

Title: Drone Detection and Tracking using Deep Convolutional Neural Networks from Real-time CCTV Footage

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Abstract: Drones are flying objects that may be controlled remotely or programmed to do a wide range of tasks, including aerial photography, videography, surveys, crop and animal monitoring, search and rescue missions, package delivery, and military operations. Unrestrained use, however, can pose a significant threat to safety, privacy, and security through eavesdropping, flying close to prohibited locations, interfering with public events, and delivering illicit items. Hence, real-time drone detection and tracking are indispensable and appropriate measures. This study developed real-time drone detection and tracking using the most efficient deep-learning approaches. The models were fine-tuned first to suit the required purpose and yield the desired outcome. The performance of the developed system was better than that of earlier endeavors in terms of accuracy and loss. Of the seven fine-tuned models, the Xception model constantly rendered the maximum accuracy with negligible loss. The model outperformed other state-of-the-art architectures, exhibiting an accuracy and loss of 99.18% and 3.83, respectively.

Keywords: Drone detection Real-time tracking Deep learning Exception model Model fine-tuning Security and privacy Object recognition Safety monitoring

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