

ABSTRACT

Counting and recognizing animals in their natural habitat has often been a difficult and complex task, especially when involving large areas. Traditional methods of counting and identifying animals tend to consume significant human time and effort and are prone to accuracy Errors. Additionally, in some cases, limited access to the area can hinder obtaining relevant data. Therefore, an efficient and accurate approach is needed for animal counting and recognition in natural habitats.

This research proposes the use of Drone technology as a solution for counting and recognizing animals in their natural environment. Drones provide an efficient and flexible platform for surveying and monitoring large areas. We will integrate advanced cameras and sophisticated image recognition technology into the Drone, enabling automatic detection and recognition of various types of animals. Moreover, with Drones' capability to access hard-to-reach areas, the data collected will be more comprehensive and accurate.

Upon implementing this system, we conducted three testing scenarios: stationary Drone position, Drone movement, and testing based on light intensity. In each scenario, we achieved optimal results. For instance, in detecting deer with the Drone in a stationary position at a height of 7 meters and an angle of 45°, the Confidence ranged from 0.42 to 0.91, and at 90°, the Confidence ranged from 0.40 to 0.87, resulting in an average accuracy of 91.6%. In the testing for goats at a height of 5 meters with a speed of 0-2 m/s, the Confidence was between 0.65 and 0.85, resulting in an average accuracy of 76.4%. Additionally, the testing for cows at a lux level of 579 and a height of 4 meters resulted in an accuracy of 77.7%. These outstanding results are expected to significantly contribute to the fields of animal conservation, environmental monitoring, and scientific research.

Keywords: Drone, Animal Detection, Animal Counting, YOLOv8