IDENTIFICATION AND POPULATION COUNTING MECHANISM FOR BLUE WHALES

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Blue whales (*Balaenoptera musculus*) are the largest mammalian ever living on the planet. They are long-range migration species because of their breeding and feedings patterns. Therefore, the population is varied from time to time and location to location. Considering long-range migration; marine biologists are trying to track this endangered species to ensure their status, health conditions, and survival rate. Individual identification is a key step to the pursuit of information regards to population tracking of organisms. Unfortunately, marine species identification is intricate to accomplish due to the lack of records of living organisms. Blue whale identification based on unique pigmentation patterns using captured images. Comprehensive images captured from the right-hand side of the blue whales. Classical identification is performed by observing pigmentation patterns on a large portion of the dorsal fin, fluke, etc. We have proposed an automatic method to identify individual blue whales by calculating the ratio of their dorsal fin by matching its shape to track the blue whale population. The shape of the dorsal fin and the ratio value combination bring major key points to identify blue whales individually. The extraction of dorsal fin from background images has been done using Otsu's thresholding and morphological transformation mechanisms. The starting points of the dorsal fin were tracked and the ratio was recorded. The key features of the shape of the dorsal fin were extracted using Scale Invariant Feature Transform (SIFT) and matching pairs count by running test-cases. Finally, using ratio values and the matched pairs, the individual blue whale is tracked and the population was calculated. The proposed automated method to identify individual blue whales in a large data set gives 80% accuracy. Further, the model can be improved in accuracy by applying machine learning for feature matching purposes.

Keywords: Northern Indian Ocean blue whale, individual identification, population count, Ratio calculation, SIFT