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Marine Object Recognition using Blob Analysis

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Abstract: In this paper, a new method of marine object recognition using blob analysis has been proposed, which is suitable to general objects recognition. A powerful foreground blob analysis is proposed to classify frontal areas. Conventionally, the main focus of the objects is recognized by prepared researchers through towed nets and human perception, which make much cost and hazard administrators and animals. Specific marine objects, box jellyfish and ocean snake, are effectively recognized in this work. Experiments conducted on picture datasets gathered by the Australian Institute of Marine Science (AIMS) demonstrate the adequacy of the proposed strategy.

Keywords: Marine object, object recognition, jelly fish, ocean snake, blob analysis.

I. INTRODUCTION

It is critical for marine natural research to study assorted qualities, dissemination and wealth of creatures in the maritime water segment [1]. To screen particular creatures, for example, jellyfish and ocean wind, conventional methodologies are for the most part in view of towed nets and human perception [2, 3]. Fast approach for detecting and tracking a specific road in aerial videos is discussed in [4]. Gaussian mixture models are combined to explain road color distributions and tracking based on homography to track the road geometries where an effective method is formed to calculate homography transformations between two frames. These methodologies have disadvantages. To start with, they are intrusive, which effectively kill gathered creatures and harm creature's habitat, especially those delicate thick creatures like jellyfish [5,6]. Second, high prepared researchers are required to accurately perceive the creatures. To overcome these issues, this paper proposes a non-obtrusive method which sets up a camera to record pictures of creatures and breaks down pictures to get the coveted data.

(a) (b)

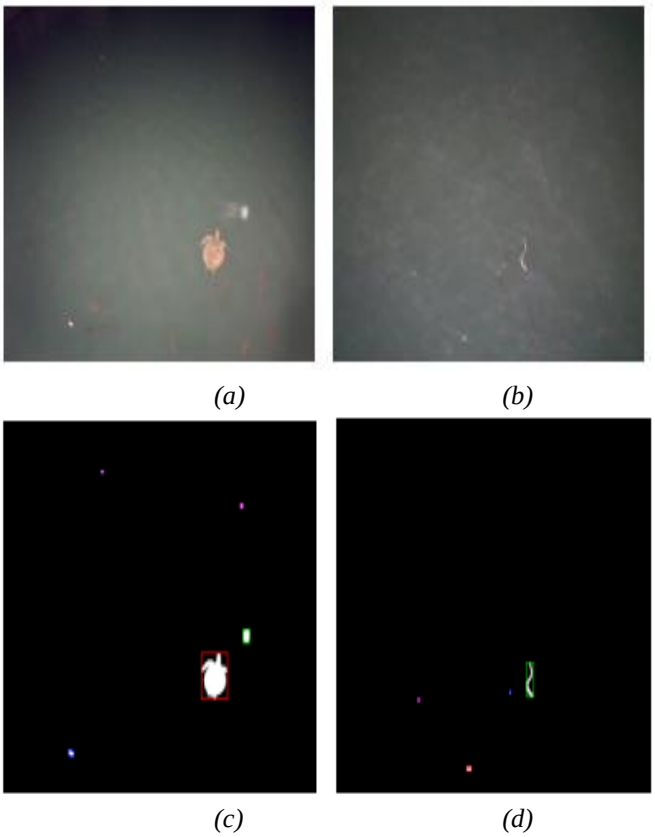
Fig.1 Image examples of box-jellyfishes (a) sea snake (b) captured by our observation camera.

In this paper, particularly observe jellyfishes and ocean snakes. As the vast majority of them are venomous and risky to individuals, it is critical to know which zones they exhibit or not. Due to their photo taxis, we utilize lights to draw in them and catch the pictures during the evening. To recognize jellyfish and ocean wind in each picture, this paper proposes an Automatic identification technique. The blob analysis is used for object recognition in marine.

II. PROPOSED METHOD

A) Object Recognition Using Blob Analysis

The image segmentation has disposed of many background pixels and accordingly object detection is just to check foreground pixels, which incredibly diminish time and enhance exactness and robustness. To perceive jellyfishes and ocean snakes, blob analysis is connected in this work.



(a) *(b)*

(c) *(d)*

Fig.2 The blob analysis of jellyfishes and sea snakes. (a)&(b)are input images. (c) & (d) blob analysis of (a) and (b) respectively, where detected blobs are given away with bounding boxes.

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It initially segregates interface regions to shape isolate zones and every range is a blob [7]. From that point forward, blob components are removed in each blob. There are many blob highlights, including region, bouncing box, arched body, jumping box proportion, minimization, focus of mass, border, and circularity. In this paper, we utilize bouncing box, minimization, jumping box proportion, and circularity to portray the shape properties of jellyfishes and ocean snakes.

III. RESULT ANALYSIS

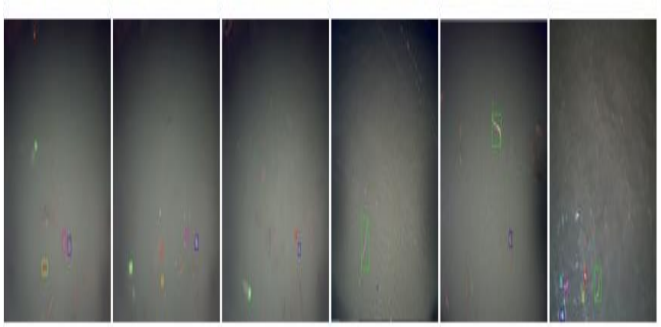

Fig.3 Recognization result of jellyfish and ocean snake are shown by green rectangles

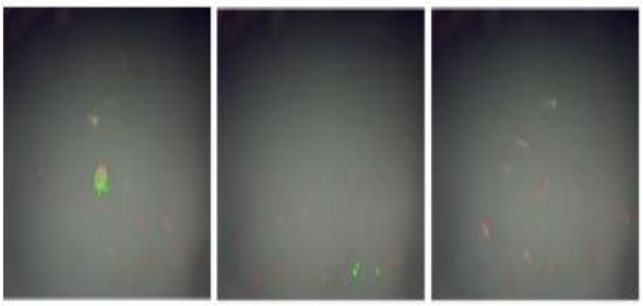

Fig.4 Performance comparison of jellyfish detection results based on color properties

Table 1 Feature Values of Blobs Analysis

Blobs	ω	h			o
yellow	12	6	0.515	.631	0.938
Green	25	30	1.122	.736	0.850
pink	8	6	0.668	.757	0.821
Red	104	112	1.056	.520	1.264
Blue	23	15	0.567	.588	0.855

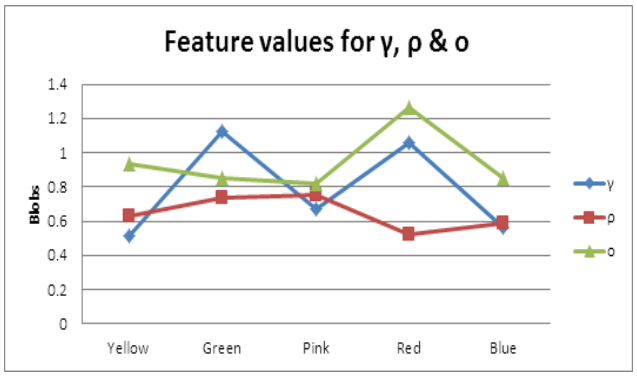

Figure 5 Performance of the proposed features values of Blob analysis for γ, ρ & o

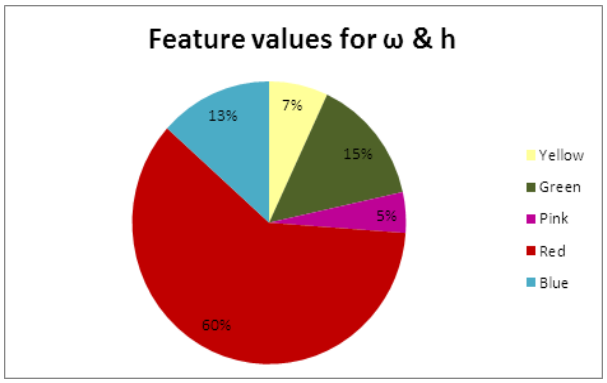

Figure 6 Performance of the proposed features values of Blob analysis for ω & h

Figure 5 & 6 shows the performance of the proposed system of Blob analysis for ω, h, γ, ρ & o for object recognition using marine image.

V. CONCLUSION

In this paper, completely automatic object recognition method for marine images using blob analysis has been proposed, which allow the non-invasive monitoring of species overcoming the issues connected with the conventional tow-net based methods. The segmentation, blob analysis is useful to foregrounds for individual recognition, where blob features jumping box, conservativeness and circularity are ascertained for each blob, and highlight determination criteria are introduced to recognize jellyfishes and ocean snakes from different foregrounds.

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