# CCML 2021 第十八屆中国机器学习会议 The 18th China Conference on Machine Learning

2021年8月6-8日 中国·长沙 AUG 6-8, 2021 CHANGSHA, CHINA

## **Information Extraction of Marine Floating Raft Agriculture Based on SegNet Convolutional Neural** Network and MRF Model

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#### **1. Introduction**

According to characteristics of floating rafts, using highresolution remote sensing images, a method of information extraction combining deep learning SegNet (semantic segmentation) and MRF (Markov random field) was proposed. In this method, two models are used to obtain the spatial detail information and depth discrimination feature information. In this method, two models are used to obtain the spatial detail information and depth discrimination feature information. It has excellent information extraction ability, deep discrimination of feature information, and can suppress noise, misjudgment and other phenomena. MRF is connected to the back end of the model, the feature information in the pixel space domain is calculated for clustering analysis to obtain the low-level spatial details of the target. The raft culture in Lianyungang adjacent sea area is selected as the research object to study the extraction results of different regions in the same image, and the method of step clipping is proposed to expand the data set.

#### **3. Experiments and Analysis**

Raft culture in Lianyungang sea area was studied. The floating raft aquaculture blocks in Lianyungang were square and densely distributed.



#### 2. Segnet + MRF raft culture information extraction method



Fig.2 Original map of raft culture area

Fig.3 Results of SegNet + MRF in raft culture area of Lianyungang City

![](_page_0_Picture_16.jpeg)

(a) Area 1

![](_page_0_Picture_18.jpeg)

![](_page_0_Picture_19.jpeg)

![](_page_0_Picture_20.jpeg)

![](_page_0_Picture_21.jpeg)

(d) Area 2

(e) Label 2

(f) Result 2

Fig.1 Raft culture information extraction process based on SegNet + MRF

Fig.4 Experimental result

### 4. Conclusions

It can be seen from the results that the classical unsupervised algorithm extracts low-level spatial detail features, which are easily interfered by the sea background and produce noise. The deep learning model is poor in processing the edge and shape of the target, and the accuracy needs to be improved. But the model can greatly reduce the loss of feature information and misjudgment caused by the sea background, and effectively suppress the generation of noise.

![](_page_0_Picture_30.jpeg)

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