Title : Image segmentation using U-Net and Mask R-CNN architectures .

1.Review :

The study presents a deep learning technique for automatically segmenting nuclei in pictures from fluorescence microscopy. The authors suggest a convolutional neural network (CNN) trained on annotated data to categorise pixels as nucleus or non-nucleus because manual segmentation takes time and is arbitrary. Even in the presence of noise and overlapping structures, the model obtains great accuracy. The method outperforms conventional segmentation algorithms in terms of accuracy, speed, and robustness, according to experimental data. Overall, this deep learning-based method makes it possible to accurately and efficiently analyse massive amounts of microscope data, boosting biological and medical research.

2.Review :

The project focuses on precisely determining, via the use of satellite remote sensing photos for mariculture, the breeding area of certain maritime regions. An approach based on Mask R-CNN is suggested for cage segmentation and density detection, and a fresh public dataset of mariculture cages is developed. The method uses sample variants to enhance the training set and divides and stitches massive high-resolution pictures to accurately segment cages. To acquire accurate area and density measurements within the target detection frame and save calculation time, the approach combines object detection and segmentation. When compared to conventional approaches, experimental findings demonstrate considerable gains in segmentation precision and model resilience, with an actual area estimation relative error of just 1.3%.

3.Review :

The research suggests the ANU-Net, an attention-based nested segmentation network, for automatically segmenting medical images. With a newly created dense skip connection, the network uses a deep supervised encoder-decoder architecture. In order to combine characteristics retrieved at various layers with task-related selection, ANU-Net uses attention mechanisms between nested convolutional blocks. In order to make use of the full-resolution feature information, a hybrid loss function that combines three different types of losses is also presented. The model performs admirably in four medical image segmentation tasks when tested on the MICCAI 2017 LiTS Challenge Dataset and the ISBI 2019 CHAOS Challenge.

4.Review :

This research offers an instance detection and classification approach based on convolutional neural networks for the Road Damage Detection and Classification Challenge. The authors show that the cutting-edge object identification and instance segmentation method Mask-RCNN can rapidly and accurately identify and categorise road damage in real-world photos taken with a smartphone camera. Using an NVIDIA GeForce 1080Ti graphics card, they acquire a mean F1 score of 0.528 at an IoU of 50% and an average inference time of 0.105 seconds per picture.

5.Review :

In this research, a solution for Task 2 of the ISIC 2018 Challenges, which aims to enhance the melanoma diagnosis based on dermoscopic pictures, is discussed. The authors suggest a multi-task U-Net model for automatically identifying melanoma lesion characteristics. Their deep learning model places fifth on the final leaderboard with a Jaccard index of 0.433 on the official test data.

6.Review :

In order to enhance brain tumour segmentation in MRI images, the proposal offers utilising image segmentation and Mask R-CNN with a pre-trained ResNet backbone. To improve segmentation accuracy, image removal is used. Without image subtraction, the suggested model had a DICE coefficient of 0.69; it now has 0.75. Additionally, it is contrasted with cutting-edge models for tumour segmentation from MRI data. The approach's overall goal is to deliver more accurate and reliable tumour segmentation for better surgical planning.

7.Review :

We suggest Ellipse R-CNN, a CNN-based ellipse detector, for segmenting severely occluded objects like fruit clusters in trees. We can infer the parameters of many elliptical objects using our technique, even when they are obscured by nearby objects, thanks to the robust and compact ellipse regression based on Mask R-CNN. With the use of the U-Net structure and finely tuned feature areas, we enhance occlusion management by understanding various occlusion patterns. The accuracy of our elliptical regression is confirmed by experimental validation on artificial data of clustered ellipses. On synthetic and actual datasets of occluded and clustered elliptical objects, our method outperforms the state-of-the-art model and its variations.

8.Review :

By mapping motion sensor data to pictures, we offer a new HAR technique based on U-Net that achieves pixel-level activity identification. On four datasets, our strategy outperforms conventional and deep learning techniques like FCN, SegNet, and Mask R-CNN. For short-term tasks and minority classes, it displays greater resilience and recognition performance. We also offer the Sanitation dataset for HAR algorithm evaluation.

9.Review :

In this study, a deep learning approach is shown for finding damaged self-blast glass insulators in aerial photographs. The suggested method combines pixel classification with U-net and Fast R-CNN for object detection. The accuracy and real-time performance of the suggested method in comparison to alternative approaches are shown through experimental results on a variety of aerial picture sets.

10.Review :

In order to provide accurate and quick insulator localization during power facility health inspections, this research develops a GDIoU-based YOLOv4 deep learning network. The convergence speed and location accuracy can be increased with the use of the GDIoU loss function. A tilt correction approach also improves accuracy for insulators at various spatial angles. The suggested technique delivers three times quicker speed and a 7.37% improvement in average accuracy compared to prior approaches, as shown by extensive trials employing field insulator pictures. Effectively, the performance satisfies the requirements for online insulator location.

Reference

1 . Reference:

Deep Learning Based Segmentation of Nuclei from Fluorescence Microscopy Images Prabhakar R. Gudla1,3, George Zaki4 , Sigal Shachar2,3, Tom Misteli2,3 and Gianluca Pegoraro1,3*

2 . Reference:

Segmentation and density statistics of mariculture cages from remote sensing images using mask R-CNN Chuang Yu a,b , Zhuhua Hu a, * , Ruoqing Li a , Xin Xia a , Yaochi Zhao a,* , Xiang Fan a , Yong Bai

3 . Reference:

ANU-Net: Attention-based nested U-Net to exploit full resolution features for medical image segmentation Chen Li a , Yusong Tana,* , Wei Chena , Xin Luoa , Yulin Hea , Yuanming Gaoa , Fei Li b

4 . Reference:

Road Damage Detection And Classification In Smartphone Captured Images Using Mask R-CNN

5 . Reference:

LESION ATTRIBUTES SEGMENTATION FOR MELANOMA DETECTION WITH DEEP LEARNING

6 . Reference:

A NOVEL MASK R-CNN MODEL TO SEGMENT HETEROGENEOUS BRAIN TUMORS THROUGH IMAGE SUBTRACTION Sanskriti Singh

7.Reference:

Ellipse R-CNN: Learning to Infer Elliptical Object from Clustering and Occlusion Wenbo Dong, Student Member, IEEE, Pravakar Roy, Student Member, IEEE, Cheng Peng, Student Member, IEEE, and Volkan Isler, Senior Member, IEEE

8.Reference:

Human Activity Recognition Based on Motion Sensor Using U-Net YONG ZHANG 1 , ZHAO ZHANG1 , YU ZHANG1 , JIE BAO1 , YIFAN ZHANG2 , AND HAIQIN DENG

9.Reference:

An Accurate and Real-time Self-blast Glass Insulator Location Method Based On Faster R-CNN and U-net with Aerial Images Zenan Ling2 , Robert C. Qiu1,2 , Fellow, IEEE, Zhijian Jin2 , Member, IEEE Yuhang Zhang2 , Xing He2 , Haichun Liu2 Chu Lei2

10.Reference:

A high-performance insulators location scheme based on YOLOv4 deep learning network with GDIoU loss function Bin Ma1,2 Yongkang Fu1,2 Chunpeng Wang1,2 Jian Li1,2 Yuli Wang1,2