Segmentation

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NAME	SUMMARY	USAGE	YEAR
U-Net	U-Net was originally developed for biomedical image segmentation. It introduced an encoder-decoder architecture with skip connections, making it highly effective for various image segmentation tasks.	U-Net excels at segmenting images, particularly in the medical field, where it has been widely used for tasks like cell segmentation and organ segmentation.	2015
Mask R-CNN	Mask R-CNN is an extension of the Faster R-CNN object detection model. It introduced a branch for generating pixel-wise masks in addition to object detection, making it suitable for instance segmentation tasks.	Mask R-CNN is excellent at instance segmentation, allowing precise delineation of object boundaries within an image.	2017
DeepLab	DeepLab is a family of models developed for semantic segmentation. It incorporates atrous convolution and dilated convolutions to capture multi-scale contextual information effectively.	DeepLab models excel at semantic segmentation tasks, such as classifying every pixel in an image into predefined categories.	2018
PSPNet	PSPNet introduced the concept of the pyramid pooling module to capture contextual information at multiple scales. It has been influential in improving the accuracy of image segmentation.	PSPNet is effective in scene parsing and object segmentation, providing a global context for pixel-level predictions.	2016
HRNet	HRNet was designed to address the trade-off between spatial resolution and receptive field size in convolutional neural networks. It maintains high-resolution representations throughout the network.	HRNet is particularly strong in tasks where fine-grained details are crucial, such as human pose estimation and fine-grained object recognition.	2019
Panoptic Segmentation Models	Panoptic segmentation aims to combine instance and semantic segmentation into a unified framework, addressing both object-level and stuff-level segmentation simultaneously.	Panoptic segmentation models excel at providing a comprehensive understanding of an image by distinguishing between object instances and scene categories.	2018

- U-Net:
  - Paper: [1505.04597] U-Net: Convolutional Networks for Biomedical Image Segmentation (arxiv.org)
  - Git: milesial/Pytorch-UNet: PyTorch implementation of the U-Net for image semantic segmentation with high quality images (github.com)
- Mask R-CNN:
  - Paper: [1703.06870] Mask R-CNN (arxiv.org)
  - Git: matterport/Mask_RCNN: Mask R-CNN for object detection and instance segmentation on Keras and TensorFlow (github.com)
- Deeplab:
  - Paper: [1606.00915] DeepLab: Semantic Image Segmentation with Deep Convolutional Nets, Atrous Convolution, and Fully Connected CRFs (arxiv.org)
  - Git: leimao/DeepLab-V3: Google DeepLab V3 for Image Semantic Segmentation (github.com)
- PSPNet:
  - Paper: [1612.01105] Pyramid Scene Parsing Network (arxiv.org)
  - Git: segcv/PSPNet: Semantic_Segmentation_in_Pytorch (github.com)
- HRNet:
  - Paper: [1908.07919] Deep High-Resolution Representation Learning for Visual Recognition (arxiv.org)
  - Git: HRNet/HRNet-Object-Detection: Object detection with multi-level representations generated from deep high-resolution representation learning (HRNetV2h). This is an official implementation for our TPAMI paper "Deep High-Resolution Representation Learning for Visual Recognition". https://arxiv.org/abs/1908.07919 (github.com)
- Panoptic Segmentation Models:
  - Paper: [1801.00868] Panoptic Segmentation (arxiv.org)
  - Git: dvlab-research/PanopticFCN: Fully Convolutional Networks for Panoptic Segmentation (CVPR2021 Oral) (github.com)