Memo of semantic segmentation methods

Semantic segmentation is a task of assigning a label to every pixel in an image. It is also often referred to as the classification of images at pixel level. It plays an essential role in AI systems, for instance, self-driving cars, medical image processing, retail image analysis, scene understanding, and many other life impacting use cases. Semantic segmentation also achieves promising results in the application of damage detection.

Segmentation is one of the fundamental computer vision problems and it has been studied for long time in the research community. Therefore, many datasets and methods already exists. Most modern image segmentation techniques are based on deep learning https://arxiv.org/abs/1704.06857 However, it is not easy for the companies to select which methods to start from. In this memo, we list some of the interesting methods we had identified together with company partners in KITE. We believe they may be helpful for other companies facing similar problems.

Tutorials, surveys and introductions to semantic segmentation

https://www.tensorflow.org/tutorials/images/segmentation
https://uk.mathworks.com/help/vision/ug/getting-started-with-

semanticsegmentation-using-deep-learning.html

https://www.computer.org/csdl/journal/tp/2022/07/09356353/1rigXK0s5Ak

⌷Dataset and benchmarks

https://paperswithcode.com/task/semantic-
segmentation⌷https://cocodataset.org/#panoptic-2020⌷
https://openaccess.thecvf.com/content_CVPR_2020/papers/
Kamann_Benchmarking_the_Robustness_of_Semantic_Segmentation_Model
s_CVPR_2020_paper.pdf

Useful methods
Fully Convolutional Neural network (FCN) https://people.eecs.berkeley.edu/
~jonlong/long_shelhamer_fcn.pdf
U-Net https://arxiv.org/abs/1505.04597
DeepLabs https://arxiv.org/abs/1802.02611v3
Mask RCNN https://arxiv.org/abs/1703.06870