

Supplementary Material for Submission #520

“Deep Adversarial Networks for Biomedical Image Segmentation Utilizing Unannotated Images”

1 Experimental Results

This section provides additional experimental results.

1.1 Fungus segmentation

This section gives some experimental results on an in-house electron microscopy (EM) image dataset for fungus segmentation. Note that an important criterion for evaluating the quality of fungus segmentation results is how well adjacent fungi are separated. As Fig. 1 shows, our DAN model (SN + adversarial training) can better separate closely adjacent fungi than other methods by utilizing the morphological properties of fungi through adversarial training.

1.2 Gland segmentation

Fig. 2 shows some gland segmentation results on the 2015 MICCAI Gland Segmentation Challenge dataset. Our DAN model (SN + adversarial training) is more robust than other methods in terms of separating closely adjacent glands (the difficult cases) and producing more accurate object boundaries.

2 Unannotated Images Used in Gland Segmentation

This section provides some examples for the unannotated image data from an in-house H&E stained intestinal image dataset that we used in the gland segmentation experiments, as shown in Fig. 3. Note that the images in this in-house H&E stained intestinal image dataset may have somewhat different imaging characteristics from those in the 2015 MICCAI Gland Segmentation Challenge dataset.

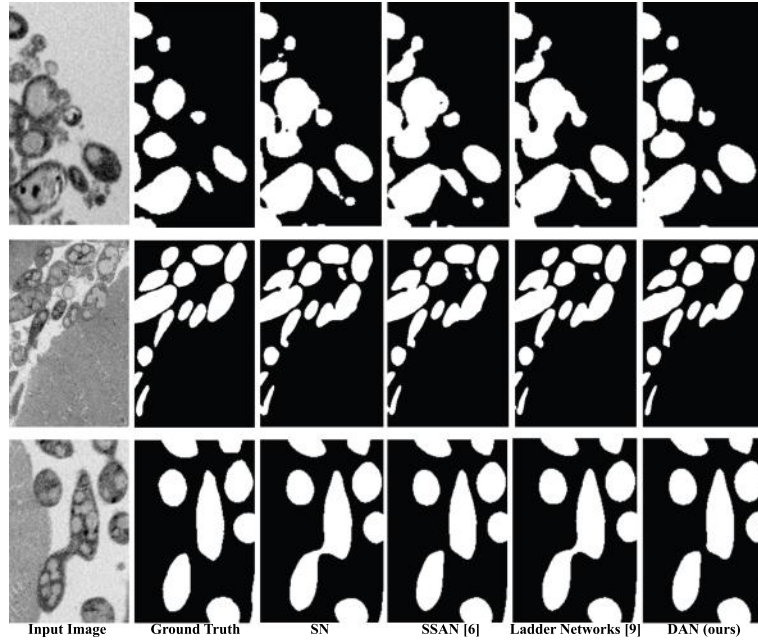


Fig. 1. Some fungus segmentation results on EM images by different methods (white = fungus and black = other tissues or background).

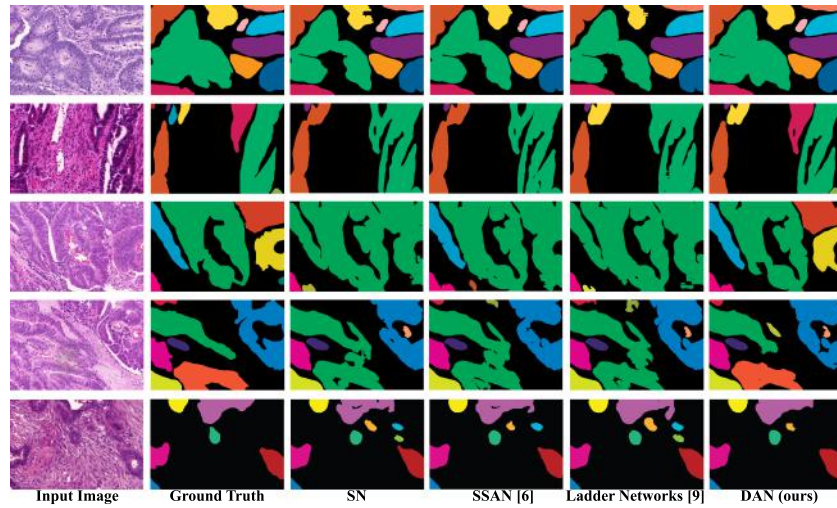


Fig. 2. Some gland segmentation results on the 2015 MICCAI Gland Segmentation Challenge dataset by different methods. Different colors indicate different individual gland objects in the corresponding segmentation.

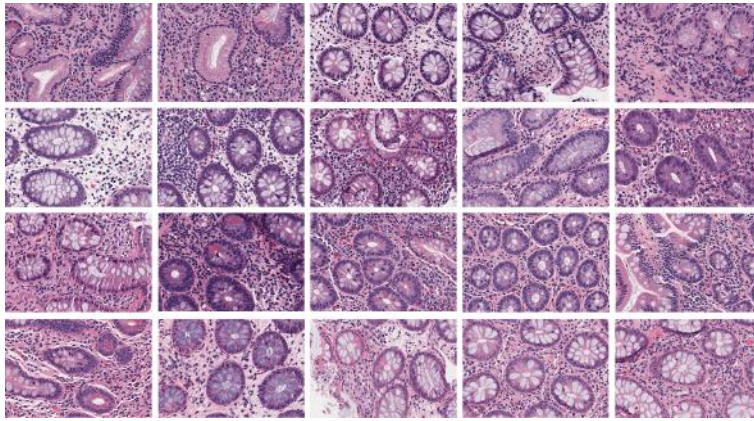


Fig. 3. Some samples of unannotated images from an in-house H&E stained intestinal image dataset that we used in the gland segmentation experiments.