

# Supplementary Material for “Deep Distance Transform for Tubular Structure Segmentation in CT Scans”

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To better understand how each component in our proposed DDT contributes the final result, two examples of the predicted pancreatic duct in the PDAC segmentation dataset [1] are shown in Fig. 1. These qualitative examples show that our distance loss term and geometry-aware refinement (*i.e.*,  $\lambda = 1$ , w/ GAR) learn more accurate scales, and can better capture the shape characteristics of the tubular structure.

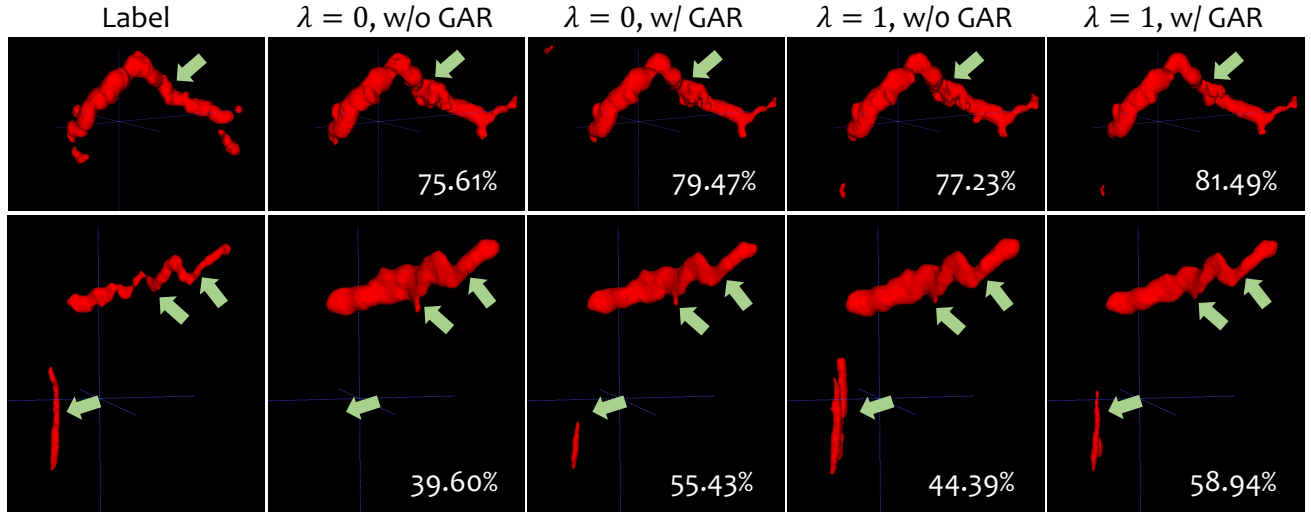


Figure 1. Illustration of duct segmentation results obtained by the ablation experiments (*c.f.*, Table 2 in our paper) for two selected example cases. Two rows show two selected cases, respectively. The first column shows the ground-truth. The rest four columns depict the combined results for  $\lambda = 0$ ,  $\lambda = 1$  and with or without geometry-aware refinement.  $\lambda = 1$ , w/ GAR leads to better segmentation results (indicated by green arrows). Numbers on the bottom right show segmentation DSCs. It’s better to use viewer zoom functionality to see fine details.

## References

- [1] Yuyin Zhou, Yingwei Li, Zhishuai Zhang, Yan Wang, Angtian Wang, Elliot K Fishman, Alan L Yuille, and Seyoun Park. Hyper-pairing network for multi-phase pancreatic ductal adenocarcinoma segmentation. In *Proc.MICCAI*, 2019. 1

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