

Convolutional Neural Network based Prostate Segmentation

1 Introduction

The development of deep learning techniques has largely improved the state-of-the-art segmentation methods [1, 3, 5]. Recently, fully convolutional networks (FCN) [3] provides a great choice for semantic image segmentation [1, 3–6]. Thus, we propose a FCN-like network to automatically segment the prostate. Due to a lot of issues in medical image field (small data set size, 3D format and so on), we propose several mechanisms to solve the training problems of the network. As it is currently under review, we donot include the details in the short paper.

2 Experiments

We use PROMISE2012 [2] dataset for training in a five cross-validation manner. And the patch size we extracted for training is 16*64*64. We are planning to evaluate our proposed approach on the test dataset of prostate segmentation.

References

- [1] Konstantinos Kamnitsas, Christian Ledig, Virginia FJ Newcombe, Joanna P Simpson, Andrew D Kane, David K Menon, Daniel Rueckert, and Ben Glocker. Efficient multi-scale 3d cnn with fully connected crf for accurate brain lesion segmentation. *Medical Image Analysis*, 36:61–78, 2017.
- [2] Geert Litjens and et al.. Evaluation of prostate segmentation algorithms for mri: the promise12 challenge. *MedIA*, 18(2):359–373, 2014.
- [3] Jonathan Long and et al.. Fully convolutional networks for semantic segmentation. In *CVPR*, pages 3431–3440, 2015.
- [4] Fausto Milletari and et al.. V-net: Fully convolutional neural networks for volumetric medical image segmentation. In *3DV*, pages 565–571. IEEE, 2016.
- [5] Olaf Ronneberger and et al.. U-net: Convolutional networks for biomedical image segmentation. In *MICCAI*, pages 234–241. Springer, 2015.
- [6] Lequan Yu and et al.. Volumetric convnets with mixed residual connections for automated prostate segmentation from 3d mr images. In *AAAI*, 2017.