

# 3D Global Convolutional Adversarial Network for Prostate MR Volumes Segmentation

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## 1 Introduction

Deep learning has been widely applied in medical image analysis and demonstrated superior performance on segmentation of organs in biomedical scans (e.g., prostate MR scans) compared to the traditional approaches. The current deep learning methods mainly conduct prostate MR scans in either 2D or 3D manners. However, the 2D processing methods tend to have limited segmentation performance since large amounts of special spatial information of the prostate MR volumes is discarded during the independent 2D processing. Meanwhile, due to the prostate volumes always come with anisotropic voxel resolution, the existing 3D processing methods, which perform 3D convolution process with same kernel size in all dimensions, still have room for improvement. To overcome the above challenges, we propose a 3D Global Convolutional Adversarial Network (3D GCA-Net) to address efficient prostate MR volumes segmentation. A 3D fully convolutional encoder-decoder network is first designed for the segmentation task. Additionally, an adversarial network is further combined with the encoder-decoder segmentation network for an efficient and robust model training.

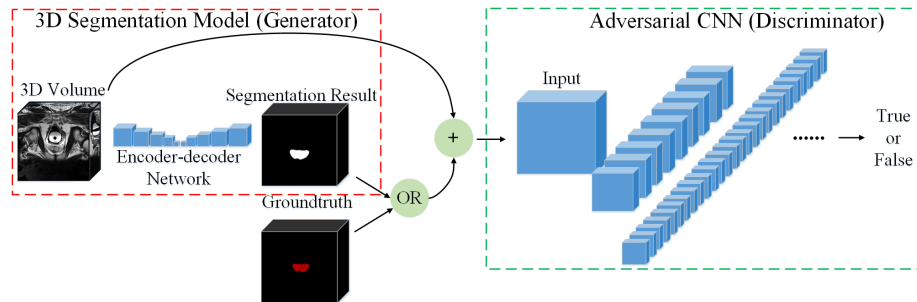


Fig. 1. Overview of the proposed approach

Since the paper is under a double-blind review, we will update a detailed version as soon as possible.