

Generative Adversarial Network for Bidirectional Mappings between Retinal Fundus Images and Vessel Segmented Images

Authors : Haoqi Gao, Koichi Ogawara

Abstract : Retinal vascular segmentation of color fundus is the basis of ophthalmic computer-aided diagnosis and large-scale disease screening systems. Early screening of fundus diseases has great value for clinical medical diagnosis. The traditional methods depend on the experience of the doctor, which is time-consuming, labor-intensive, and inefficient. Furthermore, medical images are scarce and fraught with legal concerns regarding patient privacy. In this paper, we propose a new Generative Adversarial Network based on CycleGAN for retinal fundus images. This method can generate not only synthetic fundus images but also generate corresponding segmentation masks, which has certain application value and challenge in computer vision and computer graphics. In the results, we evaluate our proposed method from both quantitative and qualitative. For generated segmented images, our method achieves dice coefficient of 0.81 and PR of 0.89 on DRIVE dataset. For generated synthetic fundus images, we use "Toy Experiment" to verify the state-of-the-art performance of our method.

Keywords : retinal vascular segmentations, generative adversarial network, cyclegan, fundus images

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