Generative Adversarial Network in Medical Imaging: A Review

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Abstract

Generative Adversarial Network is a new approach in the medical field due to its capabilities of generation without explicitly modelling the probability density function. It provides a clever way of incorporating samples and imposing higher order consistency which help in the domain adaptation, data augmentation and image-to-image translation. They therefore give the review of all the advancement it the medical imaging to give an overall view of the techniques used and developed recently in the medical field using deep learning, Generative Adversarial Network, Generative and Discriminative models.

Introduction

In this they give a review in the development/advancement of medical imaging from 1998 to 2019 from different research papers from deep learning to Generative Adversarial Network.

Their main focus is on the breakthrough on GANs and their potential application in the medical imaging. For this they take all the relevant works from different databases and set the cutoff time of the d=search as 1 January 2019.

They present the basics of GAN, its principles and the structural variants (Vanilla, DCGAN, LSGAN, CGAN). Then they present the comprehensive review of medical imaging task using GANs in the field of radiology, histopathology and dermatology and present it in a canonical task, and summarizes the review and identifies open challenges.