APPLICATION OF

GENERATIVE ADVERSARIAL NETWORKS (GAN) IN DIABETIC FOOT ULCER (DFU) DETECTION

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Abstract

Diabetics Foot Ulcers (DFU) is a burning issue in the domain of medicine and specifically in the field of diabetics. Studies show that there is a gradual increment of patients with DFU. At present the only accurate way to identify these DFU is an examination by a professional doctor who has enough knowledge to identify specifically as a DFU. This process takes a lot of time and has a significant cost also. There is only a little research being done to give a computer-aided solution for the identification of DFU.

There is a dataset which is used for the research on classification and identification of DFU using machine learning techniques. To get more accurate results this database has to be increased by size. But there are few practical issues when collecting images of DFUs. Therefore, this research is aimed to improve the dataset using machine learning techniques. Normally datasets are increased in size by data augmentation. Here the author has used Generative Adversarial Networks (GAN) for the data augmentation rather than using typical data augmentation techniques as Flipping, Cropping.

In this research, the author has done a pre-augmentation classification and post-augmentation classification. Aim to compare the metrics before and after adding augmented images to the original dataset. Final product of this research is a tool to upload any skin image and get the probability whether the uploaded image is in the Normal image class or whether the image is in the abnormal class.

This research will open doors for other researchers who are willing to improve the classification and identification of DFU images, which ultimately will help the medical community and patients to accurately identify a Diabetic Foot Ulcer.

Key Words: Machine Learning, Generative Adversarial Networks, Diabetic Foot Ulcers