

Biological image processing program

New Lightweight DL Model for Medical Image Processing, Denoising, and Disease Classification

Overview

Medical images are complicated and noisy. Device manufacturers are conducting R&D on denoising technologies using deep learning (DL). Unet is a popular model developed for medical image segmentation and has been used for image denoising. Unet as well as other DL models with higher prediction accuracies require large computational resources and have become a barrier to use in **standalone devices for remote diagnosis or deployment of AI-solutions in mobile devices for smart digital medicine.**

The "LWBNA-unet" of the present invention was designed with a focus on efficiency and reduction of computational resources. It **succeeded in reducing weight by about 10 times as compared to the conventional Unet model.** Similar to controlling the flow of information through a channel by changing its width, the LWBNA-Unet performs channel control by gradually decreasing the number of filters with attention to discriminate unnecessary features, which enables highly accurate segmentation of image features in complex and noisy images. **The method is also capable of detecting and classifying diseases automatically with high accuracy under low computational resource environments.** It is shown that the model has better capabilities of learning in terms of reproducibility and accuracy with smaller datasets as compared to conventional Unet and DeepLabv3+, models under same conditions.

Product Application

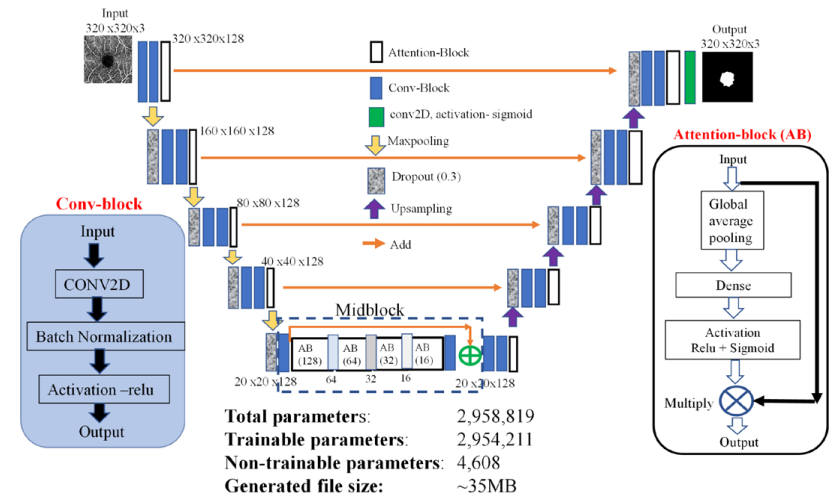
- ❑ Medical image processing such as MRI, CT, OCT etc.
- ❑ Image classification, segmentation and object tracking

IP Data

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Features · Outstandings



Related Works

[1] *Scientific Reports* volume 12, Article number: 8508 (2022)
<https://www.nature.com/articles/s41598-022-12486-w>

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