First Biweekly Report:

Diagnosis of Diabetic Retinopathy

Total Work Hours Estimating: 15 hours/person

Finished Work Overview

1. **Paper Reading**: The idea of data processing and model training in this paper is basically understood, which provides a reference for the research of this project.
2. **Exploratory Data Analysis (EDA)**:
   2.1 perform descriptively analysis to the data set.
   2.2 image standardization, image enhancement and label distribution correction.
   2.3 visually analyze the images, understanding the difference between healthy and pathological fundus, basically completed EDA.
3. **Data preprocessing**
   3.1. Binary ground truth mask
   3.2. Extract overlapping image blocks from high-resolution retinal images and corresponding masks, while maintaining a balanced ratio between lesion and non lesion image blocks
   3.3. Split the image block into a training set and a validation set, and store their file names in Train. csv and test. csv

Ongoing Work Overview

Model Reproduction:

Based on the pre-trained Resnet50 architecture, transfer learning is carried out to adapt to DR (Diabetic Retinopathy) classification tasks.

The training strategy adopts Adam Optimizer (the initial learning rate is 0.001) with ReduceLROnPlateau in Pytorch to dynamically adjust the learning rate.
(The evaluation index is mainly the Rectangular Weighted Kappa (QWK), taking into account the accuracy and confusion matrix.)

Key challenges and Solutions

1. The local GPU memory is insufficient, so I use the AutoDL platform GPU resources, and optimize the batch size (from 32 to 16).
2. Some image labels are different from the description in the paper. About 5% abnormal labels are corrected.
3. The occurrence of NaN in IOU calculation may be due to input data issues.
4. The paper environment is older and may require adjustments to the TensorFlow version.