**Biweekly Report: Diagnosis of Diabetic Retinopathy - Chenyu Huang**

**Total Work Hours: 15 hours [5.12 - 5.25]**

**Work Overview**

In the past two weeks, I continued the progress made previously, focusing mainly on the reproduction of the paper [APTOS Diabetic Retinopathy (EDA & starter)](https://www.kaggle.com/code/tanlikesmath/intro-aptos-diabetic-retinopathy-eda-starter) in the *Kaggle* competition.

During the period in last report, I optimized and obtained a model which has a good recognition accuracy around 90% on the APTOS2019 dataset. This two weeks, I’ve mainly conducted TTA (Test-Time Augmentation), which is a method of applying data enhancement in the test phase and can effectively improve the stability and accuracy of the model.

**Task Progress**

1. **Test-Time Augmentation (TTA)**
   1. TTA Implementation  
      Implemented and tested the TTA approach by augmenting the test set with several transformations, such as rotation, zoom, and flips. The aim was to enhance the model's robustness by generating multiple versions of the test data for each input.
   2. Fine-tuning Predictions  
      Combined the original predictions with those obtained from the augmented data, weighted them appropriately, and used them to improve the final test results. The performance was evaluated through multiple predictions, and an average was computed to stabilize the outcomes.
2. **Result**
   1. Improved Accuracy  
      After applying TTA, the model showed a noticeable improvement in stability and predictive performance, maintaining an accuracy of around **91%** on the validation set. This shows the effectiveness of TTA in enhancing the model's reliability.
   2. Prediction Generation  
      Prepared the final predictions for the test set and created a submission file in the required format for the Kaggle competition. Results showed a steady enhancement when combining the original model's predictions with the TTA-generated ones.