

Biweekly Work Report (Software Engineering Management and Economics)

Time Period: April 21 – May 4

Total Working Hours: 15 hours

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Ongoing Work

I am continuing to improve the performance of a lesion segmentation model for diabetic retinopathy by refining and training the **U-Net++** architecture. The goal is to enhance the model’s ability to accurately identify and segment pathological regions in retinal images.

Work Summary (April 21 – May 4, 32h)

In this period, I focused on further improving and training the U-Net++ model. Based on previous experimentation, I refined the network structure and training strategies, including tuning the loss functions and optimizer configuration. These adjustments have led to improved segmentation accuracy.

After training on the IDRiD dataset using 512×512 image patches, the model achieved the following results on the test set:

Metric	Value
Mean Dice Coefficient	0.6238
Mean Precision	0.6835
Mean Recall	0.7075
Mean F1 Score	0.6325

Most predictions scored above 0.6 in Dice, indicating consistent segmentation quality, though a few outliers with low Dice suggest missed or incorrect predictions on difficult cases.

Visual Overlay Analysis:

From qualitative inspection, Green regions (true positives) show that the model can effectively capture many lesions. Red (false positives) and blue (false negatives) highlight occasional misclassifications, especially in low-contrast areas or small lesions.

These results confirm that the current U-Net++ model is performing reasonably well, laying the groundwork for further optimization in future iterations.

