

## ABSTRACT

Diabetic retinopathy (DR) is not identified and treated promptly, it might result in blindness. It is a lesion based disease which starts off as small red spots on the retina. These small red lesions are known as microaneurysms (MA). These microaneurysms gradually increase in size as the DR progresses, which eventually leads to blindness. Thus, DR can be prevented at a very early stage by eliminating the retinal microaneurysms. This study uses the YOLOV5 (You Only Look Once Version 5) algorithm to provide a unique method for the identification of diabetic retinopathy. The cutting-edge object detection algorithm YOLOV5 has proven to perform exceptionally well in a range of computer vision tasks. This study uses retinal pictures from patients with diabetes to identify lesions associated with diabetic retinopathy, including microaneurysms, hemorrhages, exudates, and neovascularization. A sizable dataset of annotated retinal pictures is used to train the suggested YOLOV5-based system to identify the unique characteristics linked to diabetic retinopathy. In order to maximize its effectiveness on the particular task of lesion detection in diabetic retinopathy, the model is adjusted. The YOLOV5 algorithm's ability to precisely identify and localize diabetic retinopathy lesions in retinal pictures is demonstrated by the experimental results. With its high sensitivity and specificity, the suggested approach holds great potential as a timely and effective diabetic retinopathy screening tool. Furthermore, YOLOV5's real-time processing powers make the system more useful for widespread clinical use.

**Keywords:** YOLOV5, Microaneurysm detection, Object detection