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## *Anemia detection using computer vision approach*

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## **Abstract:**

Anemia is a prevalent global health issue, particularly affecting vulnerable populations such as children, pregnant women, and those in low-resource settings. Traditional diagnostic methods include complete blood count (CBC) and peripheral blood smears, while more advanced techniques involve molecular diagnostics and reticulocyte counts. Recent advancements in technology have enabled the use of computer vision algorithms to analyze retinal fundus images for anemia detection. This research paper presents a comprehensive approach to anemia detection using retinal fundus images and machine learning algorithms. The study leverages the Retinal Fundus Multi-disease Image Dataset (RFMiD), consisting of 3200 fundus images captured using different fundus cameras and annotated by retinal experts. Various machine learning algorithms, including convolutional neural networks (CNNs), are applied to extract features from retinal images and classify them into normal and abnormal categories. Additionally, the paper explores the performance analysis of the developed models, evaluating metrics such as accuracy, recall, specificity, precision, AUC-ROC, and F1-score. The findings highlight the effectiveness of CNN-based approaches in detecting anemia and other retinal abnormalities, demonstrating the potential of machine learning in enhancing medical diagnostics in ophthalmology.

## **Keywords:**

Anemia, Computer Vision, Machine Learning, Retinal Fundus Image