

**CLASSIFICATION OF DIABETIC RETINOPATHY STAGES USING
DEEP LEARNING ARCHITECTURES**

The thesis submitted in partial fulfillment of the degree of

DOCTOR OF PHILOSOPHY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

By

K. SANTHIYA LAKSHMI

(Reg. No. 21PHELF001)

Supervisor

Dr. B. SARGUNAM

Professor

Department of Electronics and Communication Engineering

School of Engineering

Avinashilingam Institute for Home Science and Higher Education for Women

Coimbatore

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80_Recommendation

The scope of the hybrid model for DR classification can be improved by the following aspects:

- **Integration with Clinical Data:** Incorporating demographic and clinical tests along with retinal imaging can significantly improve the prediction of DR.
- **Real-Time Application:** Deploying the hybrid model in real-time applications with edge computing can achieve real-time onsite diagnosis, particularly for resource-limited areas.
- **Generalisation to Other Medical Diagnoses:** The architecture of the hybrid model may have the potential to generalise to other medical conditions or imaging tasks, e.g., cancer identification or cardiovascular diseases.
- **Longitudinal Studies and Predictive Modelling:** Adding time-series data would assist the model in predicting disease progression and improve early intervention and treatment options.
- **Federated Learning:** Applying federated learning to train a model across hospitals will improve the model accuracy and maintain privacy by not exchanging patient information.

These approaches will strengthen and expand the hybrid model's application to various medical image tasks for better diagnosis and treatment.