Abstract

Cataract is a serious eye disease which may cause blindness. Early detection is of high significance to the treatment of cataract, which reduces the risk of patients to turning into blindness. Some studies were conducted for fundus image classification based on traditional machine learning methods. However, their performance still can be improved. Therefore, a novel deep learning based method is proposed to classify cataract using fundus images. To avoid relying on mass labelled data, the proposed method resorts to deep transfer learning to reduce the number of parameters that need to be trained. Consequently, in the proposed method, the first five convolutional layers of AlexNet are utilized for general feature learning; then three subsequent layers are designed and fine-tuned for the classification of fundus images. The best performance for cataract detection is 95.37% in terms of classification accuracy.

References
1. Miguel Caixinha, Elena Velte, M’ario Santos, and Jaime B Santos. New approach for objective cataract classification based on ultrasound techniques using multiclass svm classifiers. In Ultrasonics Symposium (IUS), 2014 IEEE International, pages 2402–2405. IEEE, 2014. Proposed: 95.37% Model[7]: 90.90% Model[19]: 93.20% Model[22]: 95.22% 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 Accuracy Fig. 4: Performance comparison with two related models.


14. Yitao Liang, Lianlian He, Chao Fan, Feng Wang, and Wei Li. Preprocessing study of...


**Index Terms**

Computer Science  
Artificial Intelligence

**Keywords**

Cataract, Deep transfer learning, Fine tuning, Deep Learning