

CATARACTNET

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Abstract: *Cataract is one of the most common eye disorders that affect people worldwide. It is a medical condition characterized by clouding of the natural lens of the eye, leading to vision distortion and eventual blindness. Accurate and timely detection of cataracts is crucial for its effective management and to prevent blindness. In this context, the paper proposes a novel deep neural network called Cataract Net for automatic cataract detection in fundus images. The authors design the network with smaller kernels, fewer parameters, and layers to reduce the computational cost and average running time of the model compared to other pre-trained convolutional neural network (CNN) models. The experimental results show that the proposed method outperforms state-of-the-art cataract detection approaches with an average accuracy of 99.13%.*

Keywords: CNN, MobilenetV2.

REFERENCES

- [1] Hua, J., Liu, Y., Wang, S., & Yu, J. (2020). Deep learning-based automatic cataract detection and grading using handheld fundus ophthalmoscope images. *BMC ophthalmology*, 20(1), 1-10.
- [2] Belghith, A., Aminaoui, A., & Benjdira, B. (2020). Cataract detection from OCT images using deep learning methods. *Journal of medical systems*, 44(4), 1-10.
- [3] Liu, H., Li, Y., Gao, X., Zhang, Z., Huang, D., & Liu, J. (2019). Automatic classification of cataract severity using deep learning architecture. *International Journal of Computer Assisted Radiology and Surgery*, 14(3), 501-508.
- [4] Saleem, M., Shafait, F., & Mian, A. (2018). Automatic cataract severity grading using deep residual networks. *Journal of healthcare engineering*, 2018.
- [5] Singh, S., Singh, S., & Kaur, M. (2019). Automatic classification of cataract images using machine learning techniques. *Journal of King Saud University-Computer and Information Sciences*, 31(1), 54-59.
- [6] J.-J. Yang, J. Li, R. Shen, Y. Zeng, J. He, J. Bi, Y. Li, Q. Zhang, L. Peng, and Q. Wang, "Exploiting ensemble learning for automatic cataract detection and grading," *Computer Methods Programs Biomed.*, vol. 124, pp. 45-57.
- [7] A. Budai, R. Bock, A. Maier, J. Hornegger, and G. Michelson, "Robust vessel segmentation in fundus images," *Int. J. Biomed. Imag.*, vol. 2013, pp. 1_11, Dec. 2013.
- [8] J. Staal, M. D. Abràmoff, M. Niemeijer, M. A. Viergever, and B. van Ginneken, "Ridge-based vessel segmentation in color images the retina," *IEEE Trans. Med. Image* vol. 23, no. 4, pp. 501_509, Apr. 2004.
- [9] L. Xiong, H. Li, and L. Xu, "An approach to evaluate blurriness in retinal images with vitreous opacity for cataract diagnosis," *J. Healthcare Eng.*, Vol. 2017, pp. 1_16, Apr. 2017.