

A Critical Analysis of Approaches to Glaucoma Detection

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Abstract: *This research paper focuses on building an accurate deep learning model to facilitate glaucoma detection. The document explains the approach used to detect glaucoma in retinal eye scans. The results of this research open the way to the widespread use of this model in the medical fraternity, because we investigated different techniques to solve this problem using different open source and freely available models that were compared. All these templates provide a clear experience to the users who are related to this article. However, the success of these applications also depends on factors such as the quality of retinal scans, the quality of images trained with a deep learning model, etc. The paper concludes with a model that is most suitable for people to create real-time applications in the medical field and improve glaucoma awareness and early detection before it is too late.*

Keywords: "Training," "Bounding Box", "Glaucoma", "DETECTRON2".

REFERENCES

- [1] Wang, L., Liu, H., Lu, Y., Chen, H., Zhang, J. and Pu, J., 2019. A coarse-to-fine deep learning framework for optic disc segmentation in fundus images. *Biomedical signal processing and control*, 51, pp.82-89.
- [2] Saha, O., Sathish, R. and Sheet, D., 2019, May. Learning with multitask adversaries using weakly labelled data for semantic segmentation in retinal images. In *International Conference on Medical Imaging with Deep Learning* (pp. 414-426). PMLR.
- [3] Singh, V.K., Rashwan, H.A., Akram, F., Pandey, N., Sarker, M.M.K., Saleh, A., Abdulwahab, S., Maarooof, N., Torrents-Barrena, J., Romani, S. and Puig, D., 2018. Retinal Optic Disc Segmentation Using Conditional Generative Adversarial Network (Vol. 308, pp. 373-380).
- [4] Sun, X., Xu, Y., Zhao, W., You, T. and Liu, J., 2018, July. Optic disc segmentation from retinal fundus images via deep object detection networks. In *2018 40th annual international conference of the IEEE engineering in medicine and biology society (EMBC)* (pp. 5954-5957). IEEE.
- [5] Mohan, Dhruv, JR Harish Kumar, and Chandra Sekhar Seelamantula. "High-performance optic disc segmentation using convolutional neural networks." In *2018 25th IEEE international conference on image processing (ICIP)*, pp. 4038-4042. IEEE, 2018.
- [6] Calimeri, F., Marzullo, A., Stamile, C. and Terracina, G., 2016, November. Optic disc detection using fine-tuned convolutional neural networks. In *2016 12th international conference on signal-image technology & internet-based systems (SITIS)* (pp. 69-75). IEEE.
- [7] Son, J., Park, S.J. and Jung, K.H., 2019. Towards accurate segmentation of retinal vessels and the optic disc in fundoscopic images with generative adversarial networks. *Journal of digital imaging*, 32(3), pp.499-512.
- [8] Raj, P.K., Kumar, J.H., Jois, S., Harsha, S. and Seelamantula, C.S., 2019, September. A structure tensor based voronoi decomposition technique for optic cup segmentation. In *2019 IEEE International Conference on Image Processing (ICIP)* (pp. 829-833). IEEE
- [9] Yang, C., Lu, M., Duan, Y. and Liu, B., 2018. An efficient optic cup segmentation method decreasing the influences of blood vessels. *Biomedical engineering online*, 17(1), pp.1-15.