

REFERENCES

REFERENCES

- Al-Bander, B., Al-Nuaimy, W., Williams, B. M., and Zheng, Y. (2018). Multiscale sequential convolutional neural networks for simultaneous detection of fovea and optic disc. *Biomedical Signal Processing and Control*, 40, 91–101.
- Barbara Davis Center for Diabetes School of Medicine. (2024). Discussion and pictures of diabetic retinopathy lesions [Accessed: 2024-02-14].
- Bhatkalkar, B. J., Nayak, S. V., Shenoy, S. V., and Arjunan, R. V. (2021). Fundusposnet: A deep learning driven heatmap regression model for the joint localization of optic disc and fovea centers in color fundus images. *IEEE Access*, 9, 159071–159080.
- Bodapati, J. D., Shaik, N. S., and Naralasetti, V. (2021). Composite deep neural network with gated-attention mechanism for diabetic retinopathy severity classification. *Journal of Ambient Intelligence and Humanized Computing*, 12(10), 9825–9839.
- Chalakal, R. J., Abdulla, W. H., and Thulaseedharan, S. S. (2018). Automatic detection and segmentation of optic disc and fovea in retinal images. *IET Image Processing*, 12(11), 2100–2110.
- Chawla, N. V., Bowyer, K. W., Hall, L. O., and Kegelmeyer, W. P. (2002). Smote: Synthetic minority over-sampling technique. *Journal of artificial intelligence research*, 16, 321–357.
- Chen, J., Lu, Y., Yu, Q., Luo, X., Adeli, E., Wang, Y., Lu, L., Yuille, A. L., and Zhou, Y. (2021). Transunet: Transformers make strong encoders for medical image segmentation. *arXiv preprint arXiv:2102.04306*.
- Coyner, A. S., Swan, R., Brown, J. M., Kalpathy-Cramer, J., Kim, S. J., Campbell, J. P., Jonas, K., Chan, R. P., Ostmo, S., and Chiang, M. F. (2018). Deep learning for image quality assessment of fundus images in retinopathy of prematurity. *Investigative Ophthalmology & Visual Science*, 59(9), 2762–2762.
- Decenci re, E., Zhang, X., Cazuguel, G., Lay, B., Cochener, B., Trone, C., Gain, P., Ordonez, R., Massin, P., Erginay, A., et al. (2014). Feedback on a publicly distributed image database: The messidor database. *Image Analysis and Stereology*, 33(3), 231–234.

- Deka, D., Medhi, J. P., and Nirmala, S. (2015). Detection of macula and fovea for disease analysis in color fundus images. *2015 IEEE 2nd International Conference on Recent Trends in Information Systems (ReTIS)*, 231–236.
- de La Torre, J., Valls, A., and Puig, D. (2020). A deep learning interpretable classifier for diabetic retinopathy disease grading. *Neurocomputing*, 396, 465–476.
- Department of Provincial Administration. (2024). Number of people throughout the kingdom according to evidence of civil registration [Accessed: 2024-02-14, Created: 2024-02-09].
- Dinç, B., and Kaya, Y. (2023). A novel hybrid optic disc detection and fovea localization method integrating region-based convnet and mathematical approach. *Wireless Personal Communications*, 129(4), 2727–2748.
- Estopinal, C. B., Ausayakhun, S., Ausayakhun, S., Jirawison, C., Joy Bhosai, S., Margolis, T. P., and Keenan, J. D. (2013). Access to ophthalmologic care in thailand: A regional analysis. *Ophthalmic epidemiology*, 20(5), 267–273.
- Farag, M. M., Fouad, M., and Abdel-Hamid, A. T. (2022). Automatic severity classification of diabetic retinopathy based on densenet and convolutional block attention module. *IEEE Access*, 10, 38299–38308.
- Fleming, A. D., Philip, S., Goatman, K. A., Olson, J. A., and Sharp, P. F. (2006). Automated assessment of diabetic retinal image quality based on clarity and field definition. *Investigative ophthalmology & visual science*, 47(3), 1120–1125.
- Fu, Y., Zhang, G., Li, J., Pan, D., Wang, Y., and Zhang, D. (2022). Fovea localization by blood vessel vector in abnormal fundus images. *Pattern Recognition*, 129, 108711.
- Gegundez-Arias, M. E., Marin, D., Bravo, J. M., and Suero, A. (2013). Locating the fovea center position in digital fundus images using thresholding and feature extraction techniques. *Computerized Medical Imaging and Graphics*, 37(5-6), 386–393.
- Gulshan, V., Peng, L., Coram, M., Stumpe, M. C., Wu, D., Narayanaswamy, A., Venugopalan, S., Widner, K., Madams, T., Cuadros, J., et al. (2016). Development and validation of a deep learning algorithm for detection of diabetic retinopathy in retinal fundus photographs. *jama*, 316(22), 2402–2410.
- Hasan, M. K., Alam, M. A., Elahi, M. T. E., Roy, S., and Martí, R. (2021). Drnet: Segmentation and localization of optic disc and fovea from diabetic retinopathy image. *Artificial Intelligence in Medicine*, 111, 102001.

- He, A., Li, T., Li, N., Wang, K., and Fu, H. (2020). Cabnet: Category attention block for imbalanced diabetic retinopathy grading. *IEEE Transactions on Medical Imaging*, 40(1), 143–153.
- He, H., Lin, L., Cai, Z., Cheng, P., and Tang, X. (2023). Joinedtrans: Prior guided multi-task transformer for joint optic disc/cup segmentation and fovea detection. *arXiv preprint arXiv:2305.11504*.
- He, K., Zhang, X., Ren, S., and Sun, J. (2016). Deep residual learning for image recognition. *Proceedings of the IEEE conference on computer vision and pattern recognition*, 770–778.
- Huang, G., Liu, Z., Van Der Maaten, L., and Weinberger, K. Q. (2017). Densely connected convolutional networks. *Proceedings of the IEEE conference on computer vision and pattern recognition*, 4700–4708.
- Huang, Y., Zhong, Z., Yuan, J., and Tang, X. (2020). Efficient and robust optic disc detection and fovea localization using region proposal network and cascaded network. *Biomedical Signal Processing and Control*, 60, 101939.
- Isipradit, S., Sirimaharaj, M., Charukamnoetkanok, P., Thonginnetra, O., Wongsawad, W., Sathornsumetee, B., Somboonthanakij, S., Soomsawasdi, P., Jitawatanarat, U., Taweebanjongsin, W., et al. (2014). The first rapid assessment of avoidable blindness (raab) in thailand. *PloS one*, 9(12), e114245.
- Islam, M. R., Abdulrazak, L. F., Nahiduzzaman, M., Goni, M. O. F., Anower, M. S., Ahsan, M., Haider, J., and Kowalski, M. (2022). Applying supervised contrastive learning for the detection of diabetic retinopathy and its severity levels from fundus images. *Computers in Biology and Medicine*, 146, 105602.
- Kamble, R., Kokare, M., Deshmukh, G., Hussin, F. A., and Mériaudeau, F. (2017). Localization of optic disc and fovea in retinal images using intensity based line scanning analysis. *Computers in biology and medicine*, 87, 382–396.
- Karthik, S. D., Maggie. (2019). Aptos 2019 blindness detection.
- Krause, J., Gulshan, V., Rahimy, E., Karth, P., Widner, K., Corrado, G. S., Peng, L., and Webster, D. R. (2018). Grader variability and the importance of reference standards for evaluating machine learning models for diabetic retinopathy. *Ophthalmology*, 125(8), 1264–1272.
- Li, X., Jiang, Y., Zhang, J., Li, M., Luo, H., and Yin, S. (2022). Lesion-attention pyramid network for diabetic retinopathy grading. *Artificial Intelligence in Medicine*, 126, 102259.

- Lin, T.-Y., Goyal, P., Girshick, R., He, K., and Dollár, P. (2017). Focal loss for dense object detection. *Proceedings of the IEEE international conference on computer vision*, 2980–2988.
- Liu, Z., Lin, Y., Cao, Y., Hu, H., Wei, Y., Zhang, Z., Lin, S., and Guo, B. (2021). Swin transformer: Hierarchical vision transformer using shifted windows. *Proceedings of the IEEE/CVF international conference on computer vision*, 10012–10022.
- market.us. (2024). Ai powered retina image analysis market.
- Medhi, J. P., and Dandapat, S. (2016). An effective fovea detection and automatic assessment of diabetic maculopathy in color fundus images. *Computers in biology and medicine*, 74, 30–44.
- Mvoulana, A., Kachouri, R., and Akil, M. (2019). Fully automated method for glaucoma screening using robust optic nerve head detection and unsupervised segmentation based cup-to-disc ratio computation in retinal fundus images. *Computerized Medical Imaging and Graphics*, 77, 101643.
- Nayak, J., Bhat, P. S., and Acharya, U. (2009). Automatic identification of diabetic maculopathy stages using fundus images. *Journal of medical engineering & technology*, 33(2), 119–129.
- Niemeijer, M., Abramoff, M. D., and Van Ginneken, B. (2009). Fast detection of the optic disc and fovea in color fundus photographs. *Medical image analysis*, 13(6), 859–870.
- Ouyang, J., Mao, D., Guo, Z., Liu, S., Xu, D., and Wang, W. (2023). Contrastive self-supervised learning for diabetic retinopathy early detection. *Medical & Biological Engineering & Computing*, 61(9), 2441–2452.
- Palanisamy, G., Ponnusamy, P., and Gopi, V. P. (2023). An adaptive enhancement and fovea detection technique for color fundus image analysis. *Signal, Image and Video Processing*, 17(3), 831–838.
- Parsa, S., and Khatibi, T. (2024). Grading the severity of diabetic retinopathy using an ensemble of self-supervised pre-trained convolutional neural networks: Essp-cnns. *Multimedia Tools and Applications*, 1–34.
- Paszke, A. (2019). Pytorch: An imperative style, high-performance deep learning library. *arXiv preprint arXiv:1912.01703*.
- Pedregosa, F., Varoquaux, G., Gramfort, A., Michel, V., Thirion, B., Grisel, O., Blondel, M., Prettenhofer, P., Weiss, R., Dubourg, V., et al. (2011). Scikit-learn: Machine learning in python. *the Journal of machine Learning research*, 12, 2825–2830.

- Porwal, P., Pachade, S., Kamble, R., Kokare, M., Deshmukh, G., Sahasrabuddhe, V., and Meriaudeau, F. (2018). Indian diabetic retinopathy image dataset (idrid): A database for diabetic retinopathy screening research. *Data*, 3(3).
- Quellec, G., Al Hajj, H., Lamard, M., Conze, P.-H., Massin, P., and Cochener, B. (2021). Explain: Explanatory artificial intelligence for diabetic retinopathy diagnosis. *Medical Image Analysis*, 72, 102118.
- Qummar, S., Khan, F. G., Shah, S., Khan, A., Shamshirband, S., Rehman, Z. U., Khan, I. A., and Jadoon, W. (2019). A deep learning ensemble approach for diabetic retinopathy detection. *Ieee Access*, 7, 150530–150539.
- Resnikoff, S., Lansingh, V. C., Washburn, L., Felch, W., Gauthier, T.-M., Taylor, H. R., Eckert, K., Parke, D., and Wiedemann, P. (2019). Estimated number of ophthalmologists worldwide (international council of ophthalmology update): Will we meet the needs? *British Journal of Ophthalmology*.
- Ronneberger, O., Fischer, P., and Brox, T. (2015). U-net: Convolutional networks for biomedical image segmentation. *Medical image computing and computer-assisted intervention–MICCAI 2015: 18th international conference, Munich, Germany, October 5-9, 2015, proceedings, part III 18*, 234–241.
- Royal College of Ophthalmologists of Thailand. (2024). Ophthalmologists in thailand [Accessed: 2024-02-14].
- Sedai, S., Tennakoon, R., Roy, P., Cao, K., and Garnavi, R. (2017). Multi-stage segmentation of the fovea in retinal fundus images using fully convolutional neural networks. *2017 IEEE 14th International Symposium on Biomedical Imaging (ISBI 2017)*, 1083–1086.
- Sekhar, S., Al-Nuaimy, W., and Nandi, A. K. (2008). Automated localisation of optic disk and fovea in retinal fundus images. *2008 16th European Signal Processing Conference*, 1–5.
- Şevik, U., Köse, C., Berber, T., and Erdöl, H. (2014). Identification of suitable fundus images using automated quality assessment methods. *Journal of biomedical optics*, 19(4), 046006–046006.
- Shakibania, H., Raoufi, S., Pourafkham, B., Khotanlou, H., and Mansoorizadeh, M. (2023). Dual branch deep learning network for detection and stage grading of diabetic retinopathy. *arXiv preprint arXiv:2308.09945*.

- Shankar, K., Zhang, Y., Liu, Y., Wu, L., and Chen, C.-H. (2020). Hyperparameter tuning deep learning for diabetic retinopathy fundus image classification. *IEEE Access*, 8, 118164–118173.
- Sigut, J., Nuñez, O., Fumero, F., Alayon, S., and Diaz-Aleman, T. (2023). Fovea localization in retinal images using spatial color histograms. *Multimedia Tools and Applications*, 1–19.
- Simonyan, K., and Zisserman, A. (2014). Very deep convolutional networks for large-scale image recognition. *arXiv preprint arXiv:1409.1556*.
- Sinthanayothin, C., Boyce, J. F., Cook, H. L., and Williamson, T. H. (1999). Automated localisation of the optic disc, fovea, and retinal blood vessels from digital colour fundus images. *British journal of ophthalmology*, 83(8), 902–910.
- Song, S., Dang, K., Yu, Q., Wang, Z., Coenen, F., Su, J., and Ding, X. (2022). Bilateral-vit for robust fovea localization. *2022 IEEE 19th International Symposium on Biomedical Imaging (ISBI)*, 1–5.
- Sun, R., Li, Y., Zhang, T., Mao, Z., Wu, F., and Zhang, Y. (2021). Lesion-aware transformers for diabetic retinopathy grading. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 10938–10947.
- Szegedy, C., Vanhoucke, V., Ioffe, S., Shlens, J., and Wojna, Z. (2016). Rethinking the inception architecture for computer vision. *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2818–2826.
- Tan, J. H., Acharya, U. R., Bhandary, S. V., Chua, K. C., and Sivaprasad, S. (2017). Segmentation of optic disc, fovea and retinal vasculature using a single convolutional neural network. *Journal of Computational Science*, 20, 70–79.
- Tariq, A., Shaukat, A., and Khan, S. A. (2012). A gaussian mixture model based system for detection of macula in fundus images. *Neural Information Processing: 19th International Conference, ICONIP 2012, Doha, Qatar, November 12-15, 2012, Proceedings, Part II 19*, 33–40.
- Teo, Z. L., Tham, Y.-C., Yu, M., Chee, M. L., Rim, T. H., Cheung, N., Bikbov, M. M., Wang, Y. X., Tang, Y., Lu, Y., et al. (2021). Global prevalence of diabetic retinopathy and projection of burden through 2045: Systematic review and meta-analysis. *Ophthalmology*, 128(11), 1580–1591.
- Transpire. (2024). Ai in diabetic retinopathy market, forecast to 2032.
- Tusfiquir, H. M., Nguyen, D. M., Truong, M. T., Nguyen, T. A., Nguyen, B. T., Barz, M., Profitlich, H.-J., Than, N. T., Le, N., Xie, P., et al. (2022). Drg-net: Interactive joint

- learning of multi-lesion segmentation and classification for diabetic retinopathy grading. *arXiv preprint arXiv:2212.14615*.
- Usman Akram, M., Khan, A., Iqbal, K., and Butt, W. H. (2010). Retinal images: Optic disk localization and detection. *Image Analysis and Recognition: 7th International Conference, ICIAR 2010, Póvoa de Varzin, Portugal, June 21-23, 2010, Proceedings, Part II* 7, 40–49.
- Welfer, D., Scharcanski, J., and Marinho, D. R. (2011). Fovea center detection based on the retina anatomy and mathematical morphology. *Computer methods and programs in biomedicine*, 104(3), 397–409.
- Wilkinson, C. P., Ferris III, F. L., Klein, R. E., Lee, P. P., Agardh, C. D., Davis, M., Dills, D., Kampik, A., Pararajasegaram, R., Verdaguer, J. T., et al. (2003). Proposed international clinical diabetic retinopathy and diabetic macular edema disease severity scales. *Ophthalmology*, 110(9), 1677–1682.
- Wong, T. Y., Sun, J., Kawasaki, R., Ruamviboonsuk, P., Gupta, N., Lansingh, V. C., Maia, M., Mathenge, W., Moreker, S., Muqit, M. M., et al. (2018). Guidelines on diabetic eye care: The international council of ophthalmology recommendations for screening, follow-up, referral, and treatment based on resource settings. *Ophthalmology*, 125(10), 1608–1622.
- Wykoff, C. C., Khurana, R. N., Nguyen, Q. D., Kelly, S. P., Lum, F., Hall, R., Abbass, I. M., Abolian, A. M., Stoilov, I., To, T. M., et al. (2021). Risk of blindness among patients with diabetes and newly diagnosed diabetic retinopathy. *Diabetes care*, 44(3), 748–756.
- Xie, R., Liu, J., Cao, R., Qiu, C. S., Duan, J., Garibaldi, J., and Qiu, G. (2020). End-to-end fovea localisation in colour fundus images with a hierarchical deep regression network. *IEEE Transactions on Medical Imaging*, 40(1), 116–128.
- Xue, J., Wu, J., Bian, Y., Zhang, S., and Du, Q. (2024). Classification of diabetic retinopathy based on efficient computational modeling. *Applied Sciences*, 14(23), 11327.
- Yu, H., Barriga, E. S., Agurto, C., Echegaray, S., Pattichis, M. S., Bauman, W., and Soliz, P. (2012). Fast localization and segmentation of optic disk in retinal images using directional matched filtering and level sets. *IEEE Transactions on information technology in biomedicine*, 16(4), 644–657.
- Zhang, W., Zhong, J., Yang, S., Gao, Z., Hu, J., Chen, Y., and Yi, Z. (2019). Automated identification and grading system of diabetic retinopathy using deep neural networks. *Knowledge-Based Systems*, 175, 12–25.

Zheng, S., Pan, L., Chen, J., and Yu, L. (2014). Automatic and efficient detection of the fovea center in retinal images. *2014 7th International Conference on Biomedical Engineering and Informatics*, 145–150.