

## DAFTAR PUSTAKA

- [1] R. J. Casson, G. Chidlow, J. P. Wood, J. G. Crowston, dan I. Goldberg, “Definition of glaucoma: clinical and experimental concepts,” *Clin. Experiment. Ophthalmol.*, vol. 40, no. 4, hlm. 341–349, Mei 2012, doi: 10.1111/j.1442-9071.2012.02773.x.
- [2] “Understanding Glaucoma: Symptoms, Causes, Diagnosis, Treatment,” American Academy of Ophthalmology. Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://www.aao.org/eye-health/diseases/what-is-glaucoma>
- [3] “Glaukoma - Penyebab, Gejala, Jenis, dan Cara Mengatasinya,” JEC Eye Hospitals & Clinics Best Eye Hospital in Indonesia LASIK Cataract Dry Eye Relex SMILE Glaucoma Low Vision Retina. Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://jec.co.id/id/article/glaukoma-adalah>
- [4] H. A. Quigley, “The number of people with glaucoma worldwide in 2010 and 2020,” *Br. J. Ophthalmol.*, vol. 90, no. 3, hlm. 262–267, Mar 2006, doi: 10.1136/bjo.2005.081224.
- [5] Kementerian Kesehatan Republik Indonesia, “InfoDatin Pusat Data Dan Informasi Kementerian Kesehatan RI.” Kementerian Kesehatan Republik Indonesia, 2015.
- [6] Kementerian Kesehatan Republik Indonesia, “Peraturan Menteri Kesehatan Republik Indonesia Nomor 82 Tahun 2020 Tentang Penanggulangan Gangguan Penglihatan dan Gangguan Pendengaran.” Kementerian Kesehatan Republik Indonesia, 2020.
- [7] F. Nurfajar, R. Magdalena, dan S. Sa’Idah, “Deteksi Glaukoma pada Citra Fundus Retina menggunakan Metode Local Binary Pattern dan Support Vector Machine,” *ELKOMIKA J. Tek. Energi Elektr. Tek. Telekomun. Tek. Elektron.*, vol. 10, no. 4, hlm. 769, Okt 2022, doi: 10.26760/elkomika.v10i4.769.
- [8] A. Saxena, A. Vyas, L. Parashar, dan U. Singh, “A Glaucoma Detection using Convolutional Neural Network,” dalam *2020 International Conference on Electronics and Sustainable Communication Systems (ICESC)*, Coimbatore, India: IEEE, Jul 2020, hlm. 815–820. doi: 10.1109/ICESC48915.2020.9155930.
- [9] B. Toptaş dan D. Hanbay, “The Separation of glaucoma and non-glaucoma fundus images using EfficientNet-B0,” *Bitlis Eren Üniversitesi Fen Bilim. Derg.*, vol. 11, no. 4, hlm. 1084–1092, Des 2022, doi: 10.17798/bitlisfen.1174512.





- [10] S. Kalisapudi dan R. Palanisamy, “Interpretation and Assessment of Improved Deep Networks for the Classification of Glaucoma Using Explainable Grad-CAM Approach,” dalam *Intelligent Computing and Communication*, vol. 1447, M. Seetha, S. K. Peddoju, V. Pendyala, dan V. V. S. S. S. Chakravarthy, Ed., dalam *Advances in Intelligent Systems and Computing*, vol. 1447. , Singapore: Springer Nature Singapore, 2023, hlm. 601–610. doi: 10.1007/978-981-99-1588-0\_52.
- [11] L. Li, M. Xu, X. Wang, L. Jiang, dan H. Liu, “Attention Based Glaucoma Detection: A Large-Scale Database and CNN Model,” dalam *2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Long Beach, CA, USA: IEEE, Jun 2019, hlm. 10563–10572. doi: 10.1109/CVPR.2019.01082.
- [12] S. Ovreiu, I. Cristescu, F. Balta, A. Sultana, dan E. Ovreiu, “Early Detection of Glaucoma Using Residual Networks,” dalam *2020 13th International Conference on Communications (COMM)*, Bucharest, Romania: IEEE, Jun 2020, hlm. 161–164. doi: 10.1109/COMM48946.2020.9141990.
- [13] S. Ovreiu, E.-A. Paraschiv, dan E. Ovreiu, “Deep Learning & Digital Fundus Images: Glaucoma Detection using DenseNet,” dalam *2021 13th International Conference on Electronics, Computers and Artificial Intelligence (ECAI)*, Pitesti, Romania: IEEE, Jul 2021, hlm. 1–4. doi: 10.1109/ECAI52376.2021.9515188.
- [14] C. Samarawickrama *dkk.*, “Ethnic differences in optic nerve head and retinal nerve fibre layer thickness parameters in children,” *Br. J. Ophthalmol.*, vol. 94, no. 7, hlm. 871–876, Jul 2010, doi: 10.1136/bjo.2009.158279.
- [15] S. J. Gedde *dkk.*, “Primary Open-Angle Glaucoma Preferred Practice Pattern®,” *Ophthalmology*, vol. 128, no. 1, hlm. P71–P150, Jan 2021, doi: 10.1016/j.ophtha.2020.10.022.
- [16] Y.-C. Tham, X. Li, T. Y. Wong, H. A. Quigley, T. Aung, dan C.-Y. Cheng, “Global Prevalence of Glaucoma and Projections of Glaucoma Burden through 2040,” *Ophthalmology*, vol. 121, no. 11, hlm. 2081–2090, Nov 2014, doi: 10.1016/j.ophtha.2014.05.013.
- [17] K. He, X. Zhang, S. Ren, dan J. Sun, “Deep Residual Learning for Image Recognition,” dalam *2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, NV, USA: IEEE, Jun 2016, hlm. 770–778. doi: 10.1109/CVPR.2016.90.
- [18] “Eye Anatomy: Parts of the Eye and How We See - American Academy of Ophthalmology.” Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://www.aao.org/eye-health/anatomy/parts-of-eye>





- [19] M. D. Binder, N. Hirokawa, dan U. Windhorst, Ed., *Encyclopedia of neuroscience*. Berlin ; [New York]: Springer, 2009.
- [20] J. E. Hall, *Guyton and Hall textbook of medical physiology*, 13th edition. Philadelphia, PA: Elsevier, 2016.
- [21] J. Zhu, E. Zhang, dan K. Del Rio-Tsonis, "Eye Anatomy," dalam *Encyclopedia of Life Sciences*, 1 ed., Wiley, 2012. doi: 10.1002/9780470015902.a0000108.pub2.
- [22] C. W. Oyster, *The human eye: structure and function*. Sunderland, Mass.: Sinauer Associates, 2018.
- [23] M. M. Civan, *The eye's aqueous humor*, 2nd ed. dalam *Current topics in membranes*, no. v. 62. San Diego, Calif: Academic Press/Elsevier, 2008.
- [24] R. S. Snell, I. Grunther, dan M. A. Lemp, *Clinical anatomy of the eye*, 2nd ed. Oxford Malden, MA: Blackwell Science Ltd, 1998. doi: 10.1002/9781118690987.
- [25] A. Lens, S. C. Nemeth, dan J. K. Ledford, *Ocular anatomy and physiology*, Second edition. Boca Raton: CRC Press, 2024.
- [26] H. Kolb, E. Fernandez, B. Jones, dan R. Nelson, Ed., *Webvision: The Organization of the Retina and Visual System*. Salt Lake City (UT): University of Utah Health Sciences Center, 1995. Diakses: 25 November 2025. [Daring]. Tersedia pada: <http://www.ncbi.nlm.nih.gov/books/NBK11530/>
- [27] R. H. Masland, "The Neuronal Organization of the Retina," *Neuron*, vol. 76, no. 2, hlm. 266–280, Okt 2012, doi: 10.1016/j.neuron.2012.10.002.
- [28] A. M. Smith dan C. N. Czyz, "Neuroanatomy, Cranial Nerve 2 (Optic)," dalam *StatPearls*, Treasure Island (FL): StatPearls Publishing, 2025. Diakses: 25 November 2025. [Daring]. Tersedia pada: <http://www.ncbi.nlm.nih.gov/books/NBK507907/>
- [29] "Optic nerve," Kenhub. Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://www.kenhub.com/en/library/anatomy/the-optic-nerve>
- [30] D. K. Sunderland dan A. Sapra, "Physiology, Aqueous Humor Circulation," dalam *StatPearls*, Treasure Island (FL): StatPearls Publishing, 2025. Diakses: 25 November 2025. [Daring]. Tersedia pada: <http://www.ncbi.nlm.nih.gov/books/NBK553209/>
- [31] N. Gupta dan Y. H. Yücel, "Glaucoma as a neurodegenerative disease:," *Curr. Opin. Ophthalmol.*, vol. 18, no. 2, hlm. 110–114, Mar 2007, doi: 10.1097/ICU.0b013e3280895aea.





- [32] R. N. Weinreb, T. Aung, dan F. A. Medeiros, “The Pathophysiology and Treatment of Glaucoma: A Review,” *JAMA*, vol. 311, no. 18, hlm. 1901, Mei 2014, doi: 10.1001/jama.2014.3192.
- [33] A. Marais dan E. Osuch, “The medical management of glaucoma,” *South Afr. Fam. Pract.*, vol. 59, no. 2, hlm. 6–13, Mei 2017, doi: 10.4102/safp.v59i2.4669.
- [34] R. R. Allingham dkk., *Shields Textbook of Glaucoma, 7e*. Lippincott Williams & Wilkins, a Wolters Kluwer business, 2021.
- [35] H. A. Quigley, “Glaucoma,” *The Lancet*, vol. 377, no. 9774, hlm. 1367–1377, Apr 2011, doi: 10.1016/S0140-6736(10)61423-7.
- [36] J. J. Kanski, B. Bowling, K. K. Nischal, dan A. Pearson, *Clinical ophthalmology: a systematic approach*, 7th ed. Edinburgh: Elsevier/Saunders, 2011.
- [37] D. R. Anderson, “Collaborative Normal Tension Glaucoma Study:,” *Curr. Opin. Ophthalmol.*, vol. 14, no. 2, hlm. 86–90, Apr 2003, doi: 10.1097/00055735-200304000-00006.
- [38] T. Shaarawy, M. B. Sherwood, R. A. Hitchings, dan J. G. Crowston, *Glaucoma*, 2nd edition. London New York: Elsevier, Saunders, 2015.
- [39] “Humphrey Visual Field Analyzer vs Virtual Field: Cost, Accuracy & Modern Alternatives.” Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://www.virtualfield.io/blog/humphrey-visual-field-analyzer-price-vs-virtual-field>
- [40] “European Glaucoma Society Terminology and Guidelines for Glaucoma, 5th Edition,” *Br. J. Ophthalmol.*, vol. 105, no. Suppl 1, hlm. 1–169, Jun 2021, doi: 10.1136/bjophthalmol-2021-egsguidelines.
- [41] World Health Organization, *World Report on Vision*. Geneva: World Health Organization, 2019.
- [42] Kementerian Kesehatan Republik Indonesia, *Pedoman Nasional Pelayanan Kedokteran: Tata Laksana Glaukoma (PNPK 2023)*. Jakarta: Kementerian Kesehatan Republik Indonesia, 2023.
- [43] M. T. Leite, L. M. Sakata, dan F. A. Medeiros, “Managing glaucoma in developing countries,” *Arq. Bras. Oftalmol.*, vol. 74, no. 2, hlm. 83–84, Apr 2011, doi: 10.1590/S0004-27492011000200001.
- [44] A. Mehdizadeh, A. Hoseinzadeh, dan A. Fazelzadeh, “Central corneal thickness as a risk factor for glaucoma,” *Med. Hypotheses*, vol. 69, no. 6, hlm. 1205–1207, Jan 2007, doi: 10.1016/j.mehy.2006.12.066.





- [45] A. L. Coleman, "Glaucoma," *The Lancet*, vol. 354, no. 9192, hlm. 1803–1810, Nov 1999, doi: 10.1016/S0140-6736(99)04240-3.
- [46] M. C. Leske, "Open-Angle Glaucoma—An Epidemiologic Overview," *Ophthalmic Epidemiol.*, vol. 14, no. 4, hlm. 166–172, Jan 2007, doi: 10.1080/09286580701501931.
- [47] J. L. Wiggs dan L. R. Pasquale, "Genetics of glaucoma," *Hum. Mol. Genet.*, vol. 26, no. R1, hlm. R21–R27, Agu 2017, doi: 10.1093/hmg/ddx184.
- [48] R. C. W. Wolfs, "Genetic Risk of Primary Open-angle Glaucoma: Population-Based Familial Aggregation Study," *Arch. Ophthalmol.*, vol. 116, no. 12, hlm. 1640, Des 1998, doi: 10.1001/archophth.116.12.1640.
- [49] M. C. Leske *dkk.*, "Incidence of Open-Angle Glaucoma: The Barbados Eye Studies," *Arch. Ophthalmol.*, vol. 119, no. 1, hlm. 89–95, Jan 2001, doi: 10.1001/archophth.119.1.89.
- [50] M. E. Nongpiur *dkk.*, "Novel Association of Smaller Anterior Chamber Width with Angle Closure in Singaporeans," *Ophthalmology*, vol. 117, no. 10, hlm. 1967–1973, Okt 2010, doi: 10.1016/j.ophtha.2010.02.007.
- [51] M. W. Marcus, M. M. De Vries, F. G. J. Montolio, dan N. M. Jansonius, "Myopia as a Risk Factor for Open-Angle Glaucoma: A Systematic Review and Meta-Analysis," *Ophthalmology*, vol. 118, no. 10, hlm. 1989–1994.e2, Okt 2011, doi: 10.1016/j.ophtha.2011.03.012.
- [52] G. Roberti *dkk.*, "Steroid-induced glaucoma: Epidemiology, pathophysiology, and clinical management," *Surv. Ophthalmol.*, vol. 65, no. 4, hlm. 458–472, Jul 2020, doi: 10.1016/j.survophthal.2020.01.002.
- [53] S. S. Hayreh, "Ischemic optic neuropathy," *Prog. Retin. Eye Res.*, vol. 28, no. 1, hlm. 34–62, Jan 2009, doi: 10.1016/j.preteyeres.2008.11.002.
- [54] M. Yanoff dan J. S. Duker, Ed., *Ophthalmology*, Fifth edition. Edinburgh London New York Oxford Philadelphia St. Louis Sydney: Elsevier, 2019.
- [55] J. V. Forrester, A. D. Dick, E. Pearlman, F. Roberts, dan P. G. McMenamin, *The eye: basic sciences in practice*, Fourth edition. Edinburgh New York: Elsevier, 2016.
- [56] R. N. Weinreb dan P. T. Khaw, "Primary open-angle glaucoma," *The Lancet*, vol. 363, no. 9422, hlm. 1711–1720, Mei 2004, doi: 10.1016/S0140-6736(04)16257-0.
- [57] B. S, "Understanding Fundus Cameras – How They Work, Their Types, Modes, and Applications," e-con Systems. Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://www.e->





[consystems.com/blog/camera/applications/understanding-fundus-cameras-how-they-work-their-types-modes-and-applications/](https://consystems.com/blog/camera/applications/understanding-fundus-cameras-how-they-work-their-types-modes-and-applications/)

- [58] M. D. Abramoff, M. K. Garvin, dan M. Sonka, “Retinal Imaging and Image Analysis,” *IEEE Rev. Biomed. Eng.*, vol. 3, hlm. 169–208, 2010, doi: 10.1109/RBME.2010.2084567.
- [59] O. Pomerantzeff, R. H. Webb, dan F. C. Delori, “Image formation in fundus cameras,” *Invest. Ophthalmol. Vis. Sci.*, vol. 18, no. 6, hlm. 630–637, Jun 1979.
- [60] A. Q. Saeed, S. N. H. Sheikh Abdullah, J. Che-Hamzah, dan A. T. Abdul Ghani, “Accuracy of Using Generative Adversarial Networks for Glaucoma Detection: Systematic Review and Bibliometric Analysis,” *J. Med. Internet Res.*, vol. 23, no. 9, hlm. e27414, Sep 2021, doi: 10.2196/27414.
- [61] D. H. Hubel, *Eye, brain, and vision*. dalam Scientific American Library series, no. no. 22. New York: Scientific American Library : Distributed by W.H. Freeman, 1988.
- [62] R. A. Hitchings dan G. L. Spaeth, “The optic disc in glaucoma II: correlation of the appearance of the optic disc with the visual field.,” *Br. J. Ophthalmol.*, vol. 61, no. 2, hlm. 107–113, Feb 1977, doi: 10.1136/bjo.61.2.107.
- [63] T. C. Chen, “Spectral domain optical coherence tomography in glaucoma: qualitative and quantitative analysis of the optic nerve head and retinal nerve fiber layer (an AOS thesis),” *Trans. Am. Ophthalmol. Soc.*, vol. 107, hlm. 254–281, Des 2009.
- [64] S. M. Drance, “Some factors in the production of low tension glaucoma.,” *Br. J. Ophthalmol.*, vol. 56, no. 3, hlm. 229–242, Mar 1972, doi: 10.1136/bjo.56.3.229.
- [65] R. Thomas, K. Loibl, dan R. Parikh, “Evaluation of a glaucoma patient,” *Indian J. Ophthalmol.*, vol. 59, no. 7, hlm. 43, 2011, doi: 10.4103/0301-4738.73688.
- [66] C. J. Barry, “Comparison of optic disc image assessment methods when examining serial photographs for glaucomatous progression,” *Br. J. Ophthalmol.*, vol. 84, no. 1, hlm. 28–30, Jan 2000, doi: 10.1136/bjo.84.1.28.
- [67] K. K. W. Cheng dan A. J. Tatham, “Spotlight on the Disc-Damage Likelihood Scale (DDLs),” *Clin. Ophthalmol. Auckl. NZ*, vol. 15, hlm. 4059–4071, Okt 2021, doi: 10.2147/OPHTH.S284618.
- [68] R. C. Gonzalez dan R. E. Woods, *Digital image processing*, Fourth, Global edition. New York, New York: Pearson Education, 2018.





- [69] B. Jähne, *Digital image processing*, 6th rev. and ext. Ed. Berlin ; New York: Springer, 2005.
- [70] S. J. Russell dan P. Norvig, *Artificial intelligence: a modern approach*, Fourth edition. dalam Pearson series in artificial intelligence. Hoboken: Pearson, 2021.
- [71] Z. Saleh, “Artificial Intelligence Definition, Ethics and Standards,” Apr 2019.
- [72] A. M. Turing, “I.—COMPUTING MACHINERY AND INTELLIGENCE,” *Mind*, vol. LIX, no. 236, hlm. 433–460, Okt 1950, doi: 10.1093/mind/LIX.236.433.
- [73] S. Harnad, “Other bodies, other minds: A machine incarnation of an old philosophical problem,” *Minds Mach.*, vol. 1, no. 1, hlm. 43–54, Feb 1991, doi: 10.1007/BF00360578.
- [74] A. Newell dan H. A. Simon, “GPS, A PROGRAM THAT SIMULATES HUMAN THOUGHT,” dalam *Readings in Cognitive Science*, Elsevier, 1988, hlm. 453–460. doi: 10.1016/B978-1-4832-1446-7.50040-6.
- [75] T. M. Mitchell, *Machine Learning*. dalam McGraw-Hill series in computer science. New York: McGraw-Hill, 1997.
- [76] C. M. Bishop, *Pattern recognition and machine learning*. dalam Information science and statistics. New York: Springer, 2006.
- [77] P. Rifkie, *Algoritma Machine Learning*. Bandung: Informatika, 2021.
- [78] “Supervised and Unsupervised learning,” GeeksforGeeks. Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://www.geeksforgeeks.org/machine-learning/supervised-unsupervised-learning/>
- [79] I. Goodfellow, Y. Bengio, dan A. Courville, *Deep learning*. dalam Adaptive computation and machine learning. Cambridge, Massachusetts: The MIT Press, 2016.
- [80] Y. LeCun, Y. Bengio, dan G. Hinton, “Deep learning,” *Nature*, vol. 521, no. 7553, hlm. 436–444, Mei 2015, doi: 10.1038/nature14539.
- [81] L. Alzubaidi *dkk.*, “Review of deep learning: concepts, CNN architectures, challenges, applications, future directions,” *J. Big Data*, vol. 8, no. 1, hlm. 53, Mar 2021, doi: 10.1186/s40537-021-00444-8.
- [82] A. H. Reynolds, “Anh H. Reynolds,” Anh H. Reynolds. Diakses: 25 November 2025. [Daring]. Tersedia pada: <https://anhreynolds.com/>





- [83] D. E. Rumelhart, G. E. Hinton, dan R. J. Williams, “Learning representations by back-propagating errors,” *Nature*, vol. 323, no. 6088, hlm. 533–536, Okt 1986, doi: 10.1038/323533a0.
- [84] S. J. Pan dan Q. Yang, “A Survey on Transfer Learning,” *IEEE Trans. Knowl. Data Eng.*, vol. 22, no. 10, hlm. 1345–1359, Okt 2010, doi: 10.1109/TKDE.2009.191.
- [85] J. Kirkpatrick *dkk.*, “Overcoming catastrophic forgetting in neural networks,” 2016, doi: 10.48550/ARXIV.1612.00796.
- [86] J. Howard dan S. Ruder, “Universal Language Model Fine-tuning for Text Classification,” 2018, *arXiv*. doi: 10.48550/ARXIV.1801.06146.
- [87] “CosineAnnealingLR — PyTorch 2.9 documentation.” Diakses: 25 November 2025. [Daring]. Tersedia pada: [https://docs.pytorch.org/docs/stable/generated/torch.optim.lr\\_scheduler.CosineAnnealingLR.html](https://docs.pytorch.org/docs/stable/generated/torch.optim.lr_scheduler.CosineAnnealingLR.html)
- [88] D. R. Wilson dan T. R. Martinez, “The general inefficiency of batch training for gradient descent learning,” *Neural Netw.*, vol. 16, no. 10, hlm. 1429–1451, Des 2003, doi: 10.1016/S0893-6080(03)00138-2.
- [89] D. P. Kingma dan J. Ba, “Adam: A Method for Stochastic Optimization,” 2014, *arXiv*. doi: 10.48550/ARXIV.1412.6980.
- [90] T. Fawcett, “An introduction to ROC analysis,” *Pattern Recognit. Lett.*, vol. 27, no. 8, hlm. 861–874, Jun 2006, doi: 10.1016/j.patrec.2005.10.010.
- [91] M. Tan dan Q. V. Le, “EfficientNet: Rethinking Model Scaling for Convolutional Neural Networks,” 11 September 2020, *arXiv*: arXiv:1905.11946. doi: 10.48550/arXiv.1905.11946.
- [92] G. Huang, Z. Liu, L. van der Maaten, dan K. Q. Weinberger, “Densely Connected Convolutional Networks,” 28 Januari 2018, *arXiv*: arXiv:1608.06993. doi: 10.48550/arXiv.1608.06993.
- [93] Y. Gao *dkk.*, “Estimating GPU memory consumption of deep learning models,” dalam *Proceedings of the 28th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, Virtual Event USA: ACM, Nov 2020, hlm. 1342–1352. doi: 10.1145/3368089.3417050.
- [94] T. Chen, B. Xu, C. Zhang, dan C. Guestrin, “Training Deep Nets with Sublinear Memory Cost,” 22 April 2016, *arXiv*: arXiv:1604.06174. doi: 10.48550/arXiv.1604.06174.





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**Penerapan Residual Network sebagai Model Deteksi Glaukoma Berbasis Citra Fundus**  
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[95] Riley Kiefer, “SMDG, A Standardized Fundus Glaucoma Dataset.” Kaggle.  
doi: 10.34740/KAGGLE/DS/2329670.

