

DAFTAR PUSTAKA

- [1] K. Armanious *et al.*, “Organ-based Chronological Age Estimation based on 3D MRI Scans,” *2020 28th European Signal Processing Conference (EUSIPCO)*, pp. 1225–1228, Jan. 2021, doi: 10.23919/Eusipco47968.2020.9287398.
- [2] F. Rusydiana, F. Oscandar, and B. Sam, “Identifikasi usia berdasarkan metode Al Qahtani melalui radiograf panoramik di RSGM FKG UNPADAge identification based on Al Qahtani method through panoramic radiograph at the Dental Hospital of Universitas Padjadjaran,” *JKG*, vol. 28, no. 3, Art. no. 3, Dec. 2016, doi: 10.24198/jkg.v28i3.18695.
- [3] A. Kurniawan *et al.*, “The Applicable Dental Age Estimation Methods for Children and Adolescents in Indonesia,” *International Journal of Dentistry*, vol. 2022, p. e6761476, Feb. 2022, doi: 10.1155/2022/6761476.
- [4] I. A. Annariswati and S. R. A. Agitha, “Age estimation accuracy based on Atlas London and Schour-Massler in Tionghoa ethnic children,” *Jurnal Radiologi Dentomaksilofasial Indonesia (JRDI)*, vol. 5, no. 2, Art. no. 2, Aug. 2021, doi: 10.32793/jrdi.v5i2.704.
- [5] M. E. Ladd *et al.*, “Pros and cons of ultra-high-field MRI/MRS for human application,” *Progress in Nuclear Magnetic Resonance Spectroscopy*, vol. 109, pp. 1–50, Dec. 2018, doi: 10.1016/j.pnmrs.2018.06.001.
- [6] C. D. Good, I. S. Johnsrude, J. Ashburner, R. N. A. Henson, K. J. Friston, and R. S. J. Frackowiak, “A Voxel-Based Morphometric Study of Ageing in 465 Normal Adult Human Brains,” *NeuroImage*, vol. 14, no. 1, pp. 21–36, Jul. 2001, doi: 10.1006/nimg.2001.0786.
- [7] J. Cheng *et al.*, “Brain Age Estimation From MRI Using Cascade Networks With Ranking Loss,” *IEEE Transactions on Medical Imaging*, vol. 40, no. 12, pp. 3400–3412, Dec. 2021, doi: 10.1109/TMI.2021.3085948.
- [8] E. S. Ko and E. A. Morris, “Abbreviated Magnetic Resonance Imaging for Breast Cancer Screening: Concept, Early Results, and Considerations,” *Korean J Radiol*, vol. 20, no. 4, Art. no. 4, 2019, doi: 10.3348/kjr.2018.0722.
- [9] B. Neumayer *et al.*, “The four-minute approach revisited: accelerating MRI-based multi-factorial age estimation,” *Int J Legal Med*, vol. 134, no. 4, pp. 1475–1485, Jul. 2020, doi: 10.1007/s00414-019-02231-w.
- [10] D. Nam, R. L. Barrack, and H. G. Potter, “What Are the Advantages and Disadvantages of Imaging Modalities to Diagnose Wear-related Corrosion Problems?,” *Clin Orthop Relat Res*, vol. 472, no. 12, Art. no. 12, Dec. 2014, doi: 10.1007/s11999-014-3579-9.
- [11] N. D. Simaremare, “Estimasi Usia Berdasarkan Gambaran Radiografi Panoramik Menurut Metode Demirjian dan Nolla Pada Pasien Usia 8-11 Tahun,” Universitas Sumatera Utara, Medan, 2019.
- [12] K. Ginzlová, T. Dostálová, H. Eliášová, A. Vinšů, A. Buček, and M. Bučková, “Using Dental Age to Estimate Chronological Age in Czech Children Aged 3–18 Years,” *Prague Med. Rep.*, vol. 116, no. 2, pp. 139–154, Jun. 2015, doi: 10.14712/23362936.2015.52.
- [13] S. Periyakaruppan, M. A. Meundi, and C. M. David, “Accuracy of age estimation in 6-21 year old South Indian population – A comparative analysis of clinical and radiographic methods,” *J Forensic Odontostomatol*, vol. 36, no. 2, pp. 10–19, Dec. 2018.
- [14] A. Fakhirah, “Estimasi Usia Melalui Visibilitas Ligamen Periodontal Pada Gigi Molar Ketiga Mandibula Ditinjau Dari Radiografi Periapikal Digital,” Universitas Sumatera Utara, Medan, 2020.



- [15] M. Y. Basori, "Rancang Bangun Sistem Pengukuran Tekanan Darah Berbasis Photoplethysmography Untuk Instrumentasi Pengukuran Psikoterapi," Universitas Gadjah Mada, Yogyakarta, 2020.
- [16] R. Mohamad Rozi, S. Usman, M. A. Mohd Ali, and M. B. I. Reaz, "Second derivatives of photoplethysmography (PPG) for estimating vascular aging of atherosclerotic patients," in *2012 IEEE-EMBS Conference on Biomedical Engineering and Sciences*, Langkawi, Malaysia, Dec. 2012, pp. 256–259. doi: 10.1109/IECBES.2012.6498064.
- [17] D. N. Dutt and S. Shruthi, "Digital processing of ECG and PPG signals for study of arterial parameters for cardiovascular risk assessment," in *2015 International Conference on Communications and Signal Processing (ICCSP)*, Melmaruvathur, India, Apr. 2015, pp. 1506–1510. doi: 10.1109/ICCSP.2015.7322766.
- [18] A. W. Gardner and D. E. Parker, "Association Between Arterial Compliance and Age in Participants 9 to 77 Years Old," *Angiology*, vol. 61, no. 1, pp. 37–41, Feb. 2010, doi: 10.1177/0003319709339588.
- [19] M. Elgendi, "On the Analysis of Fingertip Photoplethysmogram Signals," *CCR*, vol. 8, no. 1, Art. no. 1, Jun. 2012, doi: 10.2174/157340312801215782.
- [20] J. M. Ahn, "New Aging Index Using Signal Features of Both Photoplethysmograms and Acceleration Plethysmograms," *Healthc Inform Res*, vol. 23, no. 1, pp. 53–59, Jan. 2017, doi: 10.4258/hir.2017.23.1.53.
- [21] J.-W. Seo, J. Choi, K. Lee, and J. U. Kim, "Age-Related Changes in the Characteristics of the Elderly Females Using the Signal Features of an Earlobe Photoplethysmogram," *Sensors*, vol. 21, no. 23, Art. no. 23, Nov. 2021, doi: 10.3390/s21237782.
- [22] R. Mothkur and K. M. Poornima, "Machine Learning will Transfigure Medical Sector: A Survey," in *2018 International Conference on Current Trends towards Converging Technologies (ICCTCT)*, Coimbatore, Mar. 2018, pp. 1–8. doi: 10.1109/ICCTCT.2018.8551134.
- [23] Y. Zhang and Z. Feng, "A SVM Method for Continuous Blood Pressure Estimation from a PPG Signal," in *Proceedings of the 9th International Conference on Machine Learning and Computing*, New York, NY, USA, Feb. 2017, pp. 128–132. doi: 10.1145/3055635.3056634.
- [24] W.-F. Wang, C.-Y. Yang, and Y.-F. Wu, "SVM-based classification method to identify alcohol consumption using ECG and PPG monitoring," *Pers Ubiquit Comput*, vol. 22, no. 2, pp. 275–287, Apr. 2018, doi: 10.1007/s00779-017-1042-0.
- [25] S. Babburi, H. Nelakurthi, V. Aparna, P. Soujanya, A. B. Kotti, and K. Ganipineni, "Radiographic Estimation of Chronological Age using Mineralization of Third Molars in Coastal Andhra, India," *J Int Oral Health*, vol. 7, no. 5, pp. 49–52, May 2015.
- [26] T. Lu, L.-R. Qiu, B. Ren, L. Shi, F. Fan, and Z.-H. Deng, "Forensic age estimation based on magnetic resonance imaging of the proximal humeral epiphysis in Chinese living individuals," *Int J Legal Med*, vol. 135, no. 6, pp. 2437–2446, Nov. 2021, doi: 10.1007/s00414-021-02653-5.
- [27] D. Milošević, M. Vodanović, I. Galić, and M. Subašić, "Automated estimation of chronological age from panoramic dental X-ray images using deep learning," *Expert Systems with Applications*, vol. 189, p. 116038, Mar. 2022, doi: 10.1016/j.eswa.2021.116038.
- [28] L. F. Tomás, L. S. Mónico, I. Tomás, P. Varela-Patiño, and B. Martín-Biedma, "The accuracy of estimating chronological age from Demirjian and Nolla methods in a



- Portuguese and Spanish sample,” *BMC Oral Health*, vol. 14, no. 1, p. 160, Dec. 2014, doi: 10.1186/1472-6831-14-160.
- [29] J. Allen, J. O’Sullivan, G. Stansby, and A. Murray, “Age-related changes in pulse risetime measured by multi-site photoplethysmography,” *Physiol. Meas.*, vol. 41, no. 7, Art. no. 7, Jul. 2020, doi: 10.1088/1361-6579/ab9b67.
- [30] R. Jaafar, E. Zahedi, and M. A. Mohd Ali, “Definition and comparison of a new vascular index between young healthy and aged subjects,” in *2014 IEEE Conference on Biomedical Engineering and Sciences (IECBES)*, Kuala Lumpur, Malaysia, Dec. 2014, pp. 911–915. doi: 10.1109/IECBES.2014.7047644.
- [31] E. Nippolainen, N. P. Podolian, R. V. Romashko, Y. N. Kulchin, and A. A. Kamshilin, “Photoplethysmographic Waveform as a Function of Subject’s Age,” *Physics Procedia*, vol. 73, pp. 241–245, 2015, doi: 10.1016/j.phpro.2015.09.164.
- [32] M. H. Chowdhury *et al.*, “Estimating Blood Pressure from the Photoplethysmogram Signal and Demographic Features Using Machine Learning Techniques,” *Sensors*, vol. 20, no. 11, Art. no. 11, Jan. 2020, doi: 10.3390/s20113127.
- [33] H. Ferdinando, M. Huotari, and T. Myllyla, “Photoplethysmography signal analysis to assess obesity, age group and hypertension,” in *2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Berlin, Germany, Jul. 2019, pp. 5572–5575. doi: 10.1109/EMBC.2019.8857570.
- [34] Y. Liang, Z. Chen, R. Ward, and M. Elgendi, “Hypertension Assessment Using Photoplethysmography: A Risk Stratification Approach,” *J Clin Med*, vol. 8, no. 1, p. E12, Dec. 2018, doi: 10.3390/jcm8010012.
- [35] N. Reljin *et al.*, “Using support vector machines on photoplethysmographic signals to discriminate between hypovolemia and euvoemia,” *PLOS ONE*, vol. 13, no. 3, p. e0195087, Mar. 2018, doi: 10.1371/journal.pone.0195087.
- [36] V. L. Bengtson and R. Settersten, *Handbook of Theories of Aging*, Third Edition. New York: Springer, 2016.
- [37] G. A. Rollandi *et al.*, “Biological Age versus Chronological Age in the Prevention of Age Associated Diseases,” *obm geriatr*, vol. 3, no. 2, Art. no. 2, Jan. 2019, doi: 10.21926/obm.geriatr.1902051.
- [38] K. Rogers, *The Cardiovascular System (The Human Body)*, First Edition. New York: Britannica Educational Publishing, 2011.
- [39] P. I. Aaronson, J. P. T. Ward, and M. J. Connolly, *The Cardiovascular System at a Glance*, Fifth Edition. London: Wiley-Blackwell, 2020.
- [40] N. Herring and D. J. Paterson, *Levick’s Introduction to Cardiovascular Physiology, Sixth Edition*, Sixth Edition. Boca Raton: CRC Press, 2018.
- [41] P. Salvi, *Pulse Waves: How Vascular Hemodynamics Affects Blood Pressure*, Second Edition. Cham: Springer, 2017.
- [42] N. Ranganathan, V. Sivacyan, and F. B. Saksena, *The Art and Science of Cardiac Physical Examination: With Heart Sounds and Pulse Wave Forms on CD (Contemporary Cardiology)*, First Edition. Totowa: Humana Press, 2006.
- [43] A. A. Kamshilin and N. B. Margaryants, “Origin of Photoplethysmographic Waveform at Green Light,” *Physics Procedia*, vol. 86, pp. 72–80, 2017, doi: 10.1016/j.phpro.2017.01.024.
- [44] V. Hartmann, H. Liu, F. Chen, Q. Qiu, S. Hughes, and D. Zheng, “Quantitative Comparison of Photoplethysmographic Waveform Characteristics: Effect of Measurement Site,” *Front. Physiol.*, vol. 10, p. 198, Mar. 2019, doi: 10.3389/fphys.2019.00198.



- [45] T. Tamura, Y. Maeda, M. Sekine, and M. Yoshida, "Wearable Photoplethysmographic Sensors—Past and Present," *Electronics*, vol. 3, no. 2, Art. no. 2, Apr. 2014, doi: 10.3390/electronics3020282.
- [46] I. Meglinski, *Biophotonics for Medical Applications*, First Edition. Cambridge: Woodhead Publishing, 2015.
- [47] M. Ghamari, D. Castaneda, A. Esparza, C. Soltanpur, and H. Nazeran, "A review on wearable photoplethysmography sensors and their potential future applications in health care," *International Journal of Biosensors & Bioelectronics*, vol. Volume 4, no. Issue 4, Aug. 2018, doi: 10.15406/ijbsbe.2018.04.00125.
- [48] G. Joseph, A. Joseph, G. Titus, R. M. Thomas, and D. Jose, "Photoplethysmogram (PPG) signal analysis and wavelet de-noising," presented at the 2014 Annual International Conference on Emerging Research Areas: Magnetics, Machines and Drives (AICERA/iCMMD), Kottayam, India, India, Jul. 2014, pp. 1–5. doi: 10.1109/AICERA.2014.6908199.
- [49] Y. Sun and N. Thakor, "Photoplethysmography Revisited: From Contact to Noncontact, From Point to Imaging," *IEEE Trans. Biomed. Eng.*, vol. 63, no. 3, Art. no. 3, Mar. 2016, doi: 10.1109/TBME.2015.2476337.
- [50] M. Elgendi *et al.*, "The use of photoplethysmography for assessing hypertension," *npj Digit. Med.*, vol. 2, no. 1, Art. no. 1, Dec. 2019, doi: 10.1038/s41746-019-0136-7.
- [51] M. Elgendi, Y. Liang, and R. Ward, "Toward Generating More Diagnostic Features from Photoplethysmogram Waveforms," *Diseases*, vol. 6, no. 1, Art. no. 1, Mar. 2018, doi: 10.3390/diseases6010020.
- [52] S. S. Shahrbabaki, B. Ahmed, T. Penzel, and D. Cvetkovic, "Photoplethysmography derivatives and pulse transit time in overnight blood pressure monitoring," in *2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Orlando, FL, USA, Aug. 2016, pp. 2855–2858. doi: 10.1109/EMBC.2016.7591325.
- [53] M. Elgendi, *PPG Signal Analysis: An Introduction Using MATLAB®*, 1st edition. Boca Raton: CRC Press, 2020.
- [54] Embedded Lab, "Easy Pulse Sensor (Version 1.1) Overview (Part 1) | Embedded Lab," 2013. <https://embedded-lab.com/blog/easy-pulse-version-1-1-sensor-overview-part-1/> (accessed Dec. 08, 2021).
- [55] Embedded Lab, "Introducing Easy Pulse Plugin: A breadboard friendly and Arduino/chipKIT compatible pulse sensor | Embedded Lab," 2015. <https://embedded-lab.com/blog/introducing-easy-pulse-plugin-breadboard-friendly-arduinochipkit-compatible-pulse-sensor/> (accessed Dec. 08, 2021).
- [56] O. G. Martins, *Arduino 101: A Technical Reference to Setup and Program Arduino Zero, Nano, Due, Mega and Uno Projects*. United States: Independently published, 2020.
- [57] A. Kurniawan, "Rancang Bangun Alat Bantu Jalan Bagi Penyandang Tunanetra Dengan Sensor yang Dapat Bergerak Ke Kanan dan Ke Kiri," UIN Sunan Kalijaga, Yogyakarta, 2019.
- [58] D. G. Mondkar, J. D. Patil, P. Balasaheb, N. B. Bhoir, and V. Ramteke, "Accident Avoidable System Using Arduino Nano and GSM," vol. 07, no. 04, Art. no. 04, 2020.
- [59] N. Huda, "Smart Rearview Sebagai Proteksi Helm Guna Mencegah Maraknya Pencurian," *JEE*, vol. 1, no. 1, Art. no. 1, Aug. 2017, doi: 10.21831/jee.v1i1.15114.
- [60] M. McRoberts, *Beginning Arduino*, Second Edition. United States: Apress, 2013.



- [61] J. Purdum, *Beginning C for Arduino, Second Edition: Learn C Programming for the Arduino*, Second Edition. United States: Apress, 2015.
- [62] M. Evans, J. Noble, and J. Hochenbaum, *Arduino in Action*. Manning, 2013.
- [63] W. W. Hwu, *GPU Computing Gems: Emerald Edition*. USA: Elsevier, 2011.
- [64] H. K. Lam, S. H. Ling, and H. T. Nguyen, *Computational Intelligence and Its Applications: Evolutionary Computation, Fuzzy Logic, Neural Network and Support Vector Machine Techniques*. London: Imperial College Press, 2012.
- [65] M. Galar, A. Fernández, E. Barrenechea, H. Bustince, and F. Herrera, “An overview of ensemble methods for binary classifiers in multi-class problems: Experimental study on one-vs-one and one-vs-all schemes,” *Pattern Recognition*, vol. 44, no. 8, pp. 1761–1776, Aug. 2011, doi: 10.1016/j.patcog.2011.01.017.
- [66] A. Antoniou, *Digital Signal Processing: Signals, Systems, and Filters*, 1st edition. New York, NY: McGraw-Hill Education, 2005.
- [67] R. Narayan, Ed., *Encyclopedia of Biomedical Engineering*, 1st edition. Amsterdam: Elsevier, 2018.
- [68] B. A. Sheno, *Introduction to Digital Signal Processing and Filter Design*, 1st edition. Hoboken, N.J: Wiley-Interscience, 2005.
- [69] H. Obeid, H. Khettab, L. Marais, M. Hallab, S. Laurent, and P. Boutouyrie, “Evaluation of arterial stiffness by finger-toe pulse wave velocity: optimization of signal processing and clinical validation,” *J Hypertens*, vol. 35, no. 8, pp. 1618–1625, Aug. 2017, doi: 10.1097/HJH.0000000000001371.
- [70] S. Krishnan, *Biomedical Signal Analysis for Connected Healthcare*, 1st edition. London San Diego, CA Cambridge, MA Kidlington, Oxford: Academic Press, 2021.
- [71] S. J. Mukhyber, D. A. Abdulah, and A. D. Majeed, “Effect Z-score Normalization on Accuracy of classification of liver disease,” *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, vol. 12, no. 14, Art. no. 14, Aug. 2021.
- [72] H. A. Prihanditya and A. Alamsyah, “The Implementation of Z-Score Normalization and Boosting Techniques to Increase Accuracy of C4.5 Algorithm in Diagnosing Chronic Kidney Disease,” *JOSCEX*, vol. 1, no. 1, pp. 63–69, Sep. 2020.
- [73] R. Larson and B. H. Edwards, *Calculus*, 9th edition. Belmont, Calif: Brooks/Cole, 2009.
- [74] H. Liu, *Wind Forecasting in Railway Engineering*, 1st edition. Elsevier, 2021.
- [75] V. Kotu and B. Deshpande, *Data Science: Concepts and Practice*, 2nd edition. Cambridge, MA: Morgan Kaufmann, 2018.
- [76] J. J. Berman, *Data Simplification: Taming Information With Open Source Tools*, 1st edition. Amsterdam: Morgan Kaufmann, 2016.
- [77] F. Ielpo, C. Merhy, and G. Simon, *Engineering Investment Process: Making Value Creation Repeatable*, 1st edition. London: Kidlington, Oxford: ISTE Press - Elsevier, 2017.
- [78] A. Panigrahi and M. R. Patra, “Chapter 6 - Network Intrusion Detection Model Based on Fuzzy-Rough Classifiers,” in *Handbook of Neural Computation*, P. Samui, S. Sekhar, and V. E. Balas, Eds. Academic Press, 2017, pp. 109–125. doi: 10.1016/B978-0-12-811318-9.00006-5.
- [79] M. Niu, Y. Li, C. Wang, and K. Han, “RFAMyloid: A Web Server for Predicting Amyloid Proteins,” *International Journal of Molecular Sciences*, vol. 19, no. 7, Art. no. 7, Jul. 2018, doi: 10.3390/ijms19072071.
- [80] BPIM, BIPM, IEC, IFCC, ILAC, ISO, IUPAC, IUPAP and OIML, “International vocabulary of metrology – Basic and general concepts and associated terms (VIM), 3rd edition.” Joint Committee for Guides in Metrology, JCGM 200:2012. [Online]. Available:



https://www.bipm.org/documents/20126/2071204/JCGM_200_2012.pdf/f0e1ad45-d337-bbeb-53a6-15fe649d0ff1

- [81] R. Pal, *Predictive Modeling of Drug Sensitivity*, 1st edition. Academic Press, 2016.
- [82] S. Kim and H. Kim, "A new metric of absolute percentage error for intermittent demand forecasts," *International Journal of Forecasting*, vol. 32, no. 3, pp. 669–679, Jul. 2016, doi: 10.1016/j.ijforecast.2015.12.003.
- [83] N. Mariana, "Pemanfaatan Perangkat Lunak PC2 Untuk Sistem Otomatisasi Ujian Praktek," *Dinamika Informatika : Jurnal Ilmiah Teknologi Informasi*, vol. 1, no. 1, Art. no. 1, Feb. 2012, doi: 10.35315/informatika.v1i1.261.
- [84] C.-F. Tsai, "Dynamic grey platform for efficient forecasting management," *Journal of Computer and System Sciences*, vol. 81, no. 6, pp. 966–980, Sep. 2015, doi: 10.1016/j.jcss.2014.12.011.
- [85] A. G. Perry, P. A. Potter, and W. Ostendorf, *Clinical Nursing Skills and Techniques, 8th Edition*, 8th edition. St. Louis, Missouri: Mosby, 2013.
- [86] A. H. Saptadi, "Sistem Akuisisi Data Multiplatform Berbasis PC dengan Tampilan Hasil di Twitter," *JRE*, vol. 11, no. 5, p. 157, Dec. 2015, doi: 10.17529/jre.v11i5.2749.
- [87] Q. Sarhan and N. Abdullah, "Arduino Based Real-Time Home Control System: Design and Implementation," *Journal of University of Duhok*, vol. 19, no. 1, pp. 133–142, Jan. 2016.
- [88] D. Fujita and A. Suzuki, "Evaluation of the Possible Use of PPG Waveform Features Measured at Low Sampling Rate," *IEEE Access*, vol. 7, pp. 58361–58367, 2019, doi: 10.1109/ACCESS.2019.2914498.
- [89] V. R. Joseph, "Optimal ratio for data splitting," *Statistical Analysis and Data Mining: The ASA Data Science Journal*, vol. 15, no. 4, pp. 531–538, 2022, doi: 10.1002/sam.11583.
- [90] A. Althnian *et al.*, "Impact of Dataset Size on Classification Performance: An Empirical Evaluation in the Medical Domain," *Applied Sciences*, vol. 11, no. 2, Art. no. 2, Jan. 2021, doi: 10.3390/app11020796.
- [91] Ajmal, T. Boonya-Ananta, A. J. Rodriguez, V. N. Du Le, and J. C. Ramella-Roman, "Monte Carlo analysis of optical heart rate sensors in commercial wearables: the effect of skin tone and obesity on the photoplethysmography (PPG) signal," *Biomed Opt Express*, vol. 12, no. 12, pp. 7445–7457, Nov. 2021, doi: 10.1364/BOE.439893.
- [92] J. Fine *et al.*, "Sources of Inaccuracy in Photoplethysmography for Continuous Cardiovascular Monitoring," *Biosensors*, vol. 11, no. 4, Art. no. 4, Apr. 2021, doi: 10.3390/bios11040126.
- [93] I. Pi, I. Pi, and W. Wu, "External factors that affect the photoplethysmography waveforms," *SN Appl. Sci.*, vol. 4, no. 1, p. 21, Dec. 2021, doi: 10.1007/s42452-021-04906-9.

