

DAFTAR PUSTAKA

- Alfaridzi, M. S. U. (2022). Perbandingan Klasifikasi Citra Spectral Angle Mapper (SAM) dan Berbasis Objek untuk Pemetaan Spesies Mangrove Menggunakan Citra Worldview-2. *Skripsi*.
<https://etd.repository.ugm.ac.id/penelitian/detail/213948>.
- Arnold, C., Biedebach, L., Küpfer, A., & Neunhoeffer, M. (2023). The role of hyperparameters in machine learning models and how to tune them. *Political Science Research and Methods*, 1-8.
- Balai Taman Nasional Karimunjawa. (2012). *Jenis Mangrove Taman Nasional Karimunjawa*. Semarang: Balai Taman Nasional Karimunjawa.
- Baloloy, A. B., Blanco, A. C., Candido, C. G., Argamosa, R. J. L., Dumalag, J. B. L. C., Dimapilis, L. L. C., & Paringit, E. C. (2018). Estimation of mangrove forest aboveground biomass using multispectral bands, vegetation indices and biophysical variables derived from optical satellite imageries: Rapideye, planetscope and sentinel-2. *ISPRS annals of the photogrammetry, remote sensing and spatial information sciences*, 4, 29-36.
- Baloloy, A. B., Blanco, A. C., Raymund Rhommel, R. R. C., & Nadaoka, K. (2020). Development and application of a new mangrove vegetation index (MVI) for rapid and accurate mangrove mapping. *ISPRS Journal of Photogrammetry and Remote Sensing*, 166 (January), 95–117.
<https://doi.org/10.1016/j.isprsjprs.2020.06.001>.
- Belgiu, M., & Drăguț, L. (2016). *Random Forest* in remote sensing: A review of applications and future directions. *ISPRS journal of photogrammetry and remote sensing*, 114, 24-31.
- Bengio, Y. (2013, July). Deep learning of representations: Looking forward. In *International conference on statistical language and speech processing* (pp. 1-37). Berlin, Heidelberg: Springer Berlin Heidelberg.
- Bini, S. A., Shah, R. F., Bendich, I., Patterson, J. T., Hwang, K. M., & Zaid, M. B. (2019). Machine learning algorithms can use wearable sensor data to

accurately predict six-week patient-reported outcome scores following joint replacement in a prospective trial. *The Journal of arthroplasty*, 34(10), 2242-2247.

Breiman, L. (2001). *Random Forests*. *Machine learning*, 45, 5-32.

Bunting, P., Rosenqvist, A., Hilarides, L., Lucas, R.M., Thomas, N., Tadono, T., Worthington, T.A., Spalding, M., Murray, N.J., Rebelo, L.M. (2022) Global Mangrove Extent Change 1996–2020: Global Mangrove Watch Version 3.0. *Remote Sensing*, 14(15):3657. <https://doi.org/10.3390/rs14153657>.

Chadwick, J. (2011). Integrated LiDAR and IKONOS multispectral imagery for mapping mangrove distribution and physical properties. *International Journal of Remote Sensing*, 32(21), 6765-6781.

Chang, N. B., & Bai, K. (2018). *Multisensor Data Fusion and Machine Learning for Environmental Remote Sensing*. CRC Press.

Chen, Z., Zhang, M., Zhang, H., & Liu, Y. (2023). Mapping mangrove using a red-edge mangrove index (REMI) based on Sentinel-2 multispectral images. *IEEE Transactions on Geoscience and Remote Sensing*.

Cherif, E., Hell, M., Brandmeier, M. (2022). DeepForest: Novel Deep Learning Models for Land Use and Land Cover Classification Using Multi-Temporal and -Modal Sentinel Data of the Amazon Basin. *Remote Sensing* 14, 5000. <https://doi.org/10.3390/rs14195000>.

Congalton, R. G., & Green, K. (2019). *Assessing the Accuracy of Remotely Sensed Data Principles and Practices (3rd ed.)*. Boca Raton: CRC Press.

Danoedoro, P., Widayani, P., Hidayati, I. N., Arjasakusuma, S., Gupita, D. D., & Salsabila, H. N. (2023). Vegetation structural composition mapping of a complex landscape using forest cover density transformation and random decision forest classifier: a comparison. *Geocarto International*, 38(1), 2220289.

- DeCastro-García, N., Castañeda, Á. L. M., García, D. E., & Carriegos, M. V. (2019). Effect of the sampling of a dataset in the hyperparameter optimization phase over the efficiency of a machine learning algorithm. *Complexity*, 2019(1), 6278908.
- Dobrinić, D., Gašparović, M., & Župan, R. (2018). Horizontal accuracy assessment of PlanetScope, RapidEye and Worldview-2 satellite imagery. *International Multidisciplinary Scientific GeoConference: SGEM*, 18(2.3), 129-136.
- Duke, N. C. (1992). *Mangrove floristics and biogeography* (Issue June, pp. 63–100). <https://doi.org/10.1029/CE041p0063>.
- Feller, L. C. (1996). Effects of nutrient enrichment on leaf anatomy of dwarf *Rhizophora mangle* L. (redmangrove). *Biotropica* 28:13-22.
- Ghosh, S. M., & Behera, M. D. (2021). Aboveground biomass estimates of tropical mangrove forest using Sentinel-1 SAR coherence data-The superiority of deep learning over a semi-empirical model. *Computers & Geosciences*, 150, 104737.
- Giri, C., Zhu, Z., Tieszen, L. L., Singh, A., Gillette, S., & Kelmelis, J. A. (2008). Mangrove forest distributions and dynamics (1975-2005) of the tsunami-affected region of Asia. *Journal of Biogeography*, 35(3), 519–528. <https://doi.org/10.1111/j.1365-2699.2007.01806.x>.
- Giri, C., Ochieng, E., Tieszen, L. L., Zhu, Z., Singh, A., Loveland, T., ... & Duke, N. (2011). Status and distribution of mangrove forests of the world using earth observation satellite data. *Global ecology and biogeography*, 20(1), 154-159.
- Global Mangrove Watch (2020). *Mangrove Habitat Extent 2020*. Retrieved from <https://www.globalmangrovetwatch.org/>.
- Green, E. P., Mumby, P. J., Edwards, A. J., & Clark, C. D. (1996). A review of remote sensing for the assessment and management of tropical coastal resources. *Coastal Management*, 24(1), 1–40. <https://doi.org/10.1080/08920759609362279>

- Green, E. P., Mumby, P. J., Edwards, A. J., Clark, C. D., & Ellis, A. C. (1997). Estimating leaf area index of mangroves from satellite data. *Aquatic botany*, 58(1), 11-19.
- Gupta, K., Mukhopadhyay, A., Giri, S., Chanda, A., Datta Majumdar, S., Samanta, S., Mitra, D., Samal, R. N., Pattnaik, A. K., & Hazra, S. (2018). An index for discrimination of mangroves from non-mangroves using LANDSAT 8 OLI imagery. *Methods* X, 5 (May), 1129–1139. <https://doi.org/10.1016/j.mex.2018.09.011>.
- Guo, M., Yu, Z., Xu, Y., Huang, Y., & Li, C. (2021a). Me-net: a deep convolutional neural network for extracting mangrove using sentinel-2a data. *Remote Sensing*, 13(7), 1292.
- Guo, Y., Liao, J., & Shen, G. (2021b). Mapping large-scale mangroves along the maritime silk road from 1990 to 2015 using a novel deep learning model and landsat data. *Remote Sensing*, 13(2), 245.
- Grömping, U. (2009). *Variable Importance Assessment in Regression: Linear Regression versus Random Forest*. *The American Statistician*, 63(4), 308–319.
- Halim, M., Soeprbowati, T. R., Hadiyanto, H., & Syahid, L. N. (2023, May). Study of area change and rehabilitation of mangrove ecosystems in Karimunjawa National Park. In *AIP Conference Proceedings* (Vol. 2683, No. 1). AIP Publishing.
- Haralick, R. M., Shanmugam, K., & Dinstein, I. H. (1973). Textural features for image classification. *IEEE Transactions on systems, man, and cybernetics*, (6), 610-621.
- Hidayatullah, M. F. (2022). Estimasi Stok Karbon Atas Permukaan Spesies Mangrove Menggunakan GEOBIA dan Indeks Vegetasi Pada Citra Worldview-2 Di Clungup Mangrove Conservation, Kabupaten Malang. *Tesis*. <http://etd.repository.ugm.ac.id/penelitian/detail/206959>.

- Hoa, N. H., Quang, P. D., & Van Truong, V. (2022). Mapping mangrove cover change using PlanetScope data (2017-2022) in Quang Yen town, Quang Ninh province toward sustainable mangrove management. *Journal of Forestry Science and Technology*, (13), 071-080.
- Hogarth, P.J. (1999) *The Biology of Mangroves*. Oxford: Oxford University Press.
- Huete, A., Didan, K., Miura, T., Rodriguez, E., Gao, X., & Ferreira, L. (2002). Overview of the radiometric and biophysical performance of the MODIS vegetation indices. *Remote Sensing of Environment*, 83(1-2), 195-213. [https://doi.org/10.1016/S0034-4257\(02\)00096-2](https://doi.org/10.1016/S0034-4257(02)00096-2).
- Huitric, M., Folke, C., & Kautsky, N. (2002). Development and government policies of the shrimp farming industry in Thailand in relation to mangrove ecosystems. *Ecological Economics*, 40(3), 441-455.
- Jakhar, D., & Kaur, I. (2019). Artificial intelligence, machine learning & deep learning: Definitions and differences. *Clinical and Experimental Dermatology*, 45(1), 131-132. doi:10.1111/ced.14029
- Jamali, A., Mahdianpari, M., Brisco, B., Granger J., Mohammadimanesh, B., & Salehi, B. (2021). *Deep Forest* classifier for wetland mapping using the combination of Sentinel-1 and Sentinel-2 data, *GIScience & Remote Sensing*, 58:7, 1072-1089, DOI: 10.1080/15481603.2021.1965399.
- Jennings, S. B., Brown, N. D., & Sheil, D. (1999). Assessing forest canopies and understorey illumination: canopy closure, canopy cover and other measures. *Forestry*, 72(1), 59-74.
- Jensen, J. R. (2014). *Remote sensing of the environment: an earth resource perspective second edition*. In Pearson Education Limited, Harlow, England (Vol. 1).
- Jia, M., Wang, Z., Mao, D., Ren, C., Song, K., Zhao, C., ... & Wang, Y. (2023). Mapping global distribution of mangrove forests at 10-m resolution. *Science Bulletin*, 68(12), 1306-1316.

- Jiang, Y., Zhang, L., Yan, M., Qi, J., Fu, T., Fan, S., & Chen, B. (2021). High-resolution mangrove forests classification with machine learning using worldview and UAV hyperspectral data. *Remote Sensing*, 13(8), 1529.
- Juniansah, A., Tama, G. C., Febriani, K. R., Baharain, M. N., Kanekaputra, T., Wulandari, Y. S., & Kamal, M. (2018). Mangrove Leaf Area Index Estimation Using Sentinel 2A Imagery in Teluk Ratai, Pesawaran Lampung. *IOP Conference Series: Earth and Environmental Science*, 165(1). <https://doi.org/10.1088/1755-1315/165/1/012004>.
- Kanekaputra, T. (2018). Pemetaan Spesies Mangrove *Avicennia sp.* Berbasis Pantulan Spektral Lapangan dan Citra Worldview-2. *Skripsi*. <https://etd.repository.ugm.ac.id/penelitian/detail/167131>.
- Kamal, M., Farda, N. M., Jamaluddin, I., Parela, A., Wikantika, K., Prasetyo, L. B., & Irawan, B. (2020). A preliminary study on machine learning and google earth engine for mangrove mapping. *IOP Conference Series: Earth and Environmental Science*, 500, 012038. doi:10.1088/1755-1315/500/1/012038.
- Kamal, M., Phinn, S., & Johansen, K. (2014). Characterizing the Spatial Structure of Mangrove Features for Optimizing Image-Based Mangrove Mapping. *Remote Sensing*, 6(2), 984–1006. doi:10.3390/rs6020984
- Kamal, M., Phinn, S., & Johansen, K. (2015). Object-based approach for multi-scale mangrove composition mapping using multi-resolution image datasets. *Remote Sensing (Vol. 7, Issue 4)*. <https://doi.org/10.3390/rs70404753>
- Kamal, M., Phinn, S., Johansen, K., & Adi, N. S. (2016, July). Estimation of mangrove leaf area index from ALOS AVNIR-2 data (A comparison of tropical and sub-tropical mangroves). In *AIP Conference Proceedings (Vol. 1755, No. 1)*. AIP Publishing.
- Kathiresan, K., & Bingham, B. L. (2001). *Biology of mangroves and mangrove Ecosystems*. *Advances in Marine Biology*, 81–251. doi:10.1016/s0065-2881(01)40003-4.

- Kellndorfer, J., Walker, W., Pierce, L., Dobson, C., Fites, J. A., Hunsaker, C., ... & Clutter, M. (2004). Vegetation height estimation from shuttle radar topography mission and national elevation datasets. *Remote sensing of Environment*, 93(3), 339-358.
- Kementerian Lingkungan Hidup dan Kehutanan. (2021). *Peta Mangrove Nasional*.
- Komiyama, A., Pongparn, S., & Kato, S. (2005). Common allometric equations for estimating the tree weight of mangroves. *Journal of tropical ecology*, 21(4), 471-477.
- Kuenzer, C., Bluemel, A., Gebhardt, S., Quoc, T. V., & Dech, S. (2011). Remote sensing of mangrove ecosystems: A review. In *Remote Sensing (Vol. 3, Issue 5)*. <https://doi.org/10.3390/rs3050878>.
- Kulkarni, A., Chong, D., & Batarseh, F. A. (2020). Foundations of data imbalance and solutions for a data democracy. In *Data Democracy* (pp. 83–106). Elsevier. <https://doi.org/10.1016/B978-0-12-818366-3.00005-8>.
- Leach, N., Coops, N. C., & Obrknezev, N. (2019). Normalization method for multi-sensor high spatial and temporal resolution satellite imagery with radiometric inconsistencies. *Computers and Electronics in Agriculture*, 164, 104893.
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *nature*, 521(7553), 436-444.
- Lewis, D., Phinn, S., & Arroyo, L. (2013). Cost-effectiveness of seven approaches to map vegetation communities—A case study from Northern Australia's tropical savannas. *Remote Sensing*, 5(1), 377-414.
- Lim, Y. S., La, P. H., Park, J. S., Lee, M. H., Pyeon, M. W., & Kim, J. I. (2015). Calculation of tree height and canopy crown from drone images using segmentation. *한국측량학회지*, 33(6), 605-613.
- Lomeo, D., & Singh, M. (2022). Cloud-based monitoring and evaluation of the spatial-temporal distribution of Southeast Asia's mangroves using deep learning. *Remote Sensing*, 14(10), 2291.

- Lucas, R., Lule, A. V., Rodríguez, M. T., Kamal, M., Thomas, N., Asbridge, E., & Kuenzer, C. (2017). *Spatial Ecology of Mangrove Forests : A Remote Sensing Perspective*. 87–112.
- Lugo, A. E., & Snedaker, S. C. (1974). The ecology of mangroves. *Annual review of ecology and systematics*, 39-64.
- Ma, L., Liu, Y., Zhang, X., Ye, Y., Yin, G., & Johnson, B. A. (2019). Deep learning in remote sensing applications: A meta-analysis and review. *ISPRS journal of photogrammetry and remote sensing*, 152, 166-177.
- Mahardhika, S. A., & Kamal, M. (2020, September). Estimation of Fractional Canopy Cover of Bedul Mangrove Forest Using PlanetScope Imagery. In *2020 6th International Conference on Science and Technology (ICST)* (Vol. 1, pp. 1-5). IEEE.
- Mahesh, B. (2020). Machine learning algorithms-a review. *International Journal of Science and Research (IJSR)*, 9(1), 381-386.
- Manessa, M. D. M., Kanno, A., Sekine, M., Haidar, M., Yamamoto, K., Imai, T., & Higuchi, T. (2016). Satellite-derived bathymetry using *Random Forest* algorithm and worldview-2 imagery. *Geoplanning: Journal of Geomatics and Planning*, 3(2), 117-126.
- Maurya, K., Mahajan, S., & Chaube, N. (2021). Remote sensing techniques: Mapping and monitoring of mangrove ecosystem—A review. *Complex & Intelligent Systems*, 7(6), 2797-2818.
- McCoy, R. M. (2005). *Field methods in remote sensing*. The Guilford Press.
- McGuinness, K. A. (1996). Dispersal, establishment and survival of *Ceriops tagal* propagules in a north Australian mangrove forest. *Oecologia*, 109, 80-87.
- Muraina, I. (2022, May). Ideal dataset splitting ratios in machine learning algorithms: general concerns for data scientists and data analysts. In *7th international Mardin Artuklu scientific research conference* (pp. 496-504).

- Mochida, Y., Fujimoto, K., Miyagi, T., Ishihara, S., Murofushi, T., Kikuchi, T., & Pramojanee, P. (1999). A phytosociological study of the mangrove vegetation in the Malay Peninsula. *Tropics*, 8(3), 207-220.
- Munawaroh, Yogyanti, G. C., Syamsuri, U. A., Kamal, M., Widayani, P., & Arjasakusuma, S. (2025, February). Mangrove vegetation mapping using Google earth engine, open-access satellite data, and machine learning. In *AIP Conference Proceedings* (Vol. 3120, No. 1). AIP Publishing.
- Nehren, U., & Wicaksono, P. (2018). Mapping soil carbon stocks in an oceanic mangrove ecosystem in Karimunjawa Islands, Indonesia. *Estuarine, Coastal and Shelf Science*, 214, 185-193.
- Pham, T. D., Xia, J., Ha, N. T., Bui, D. T., Le, N. N., & Takeuchi, W. (2019). A review of remote sensing approaches for monitoring blue carbon ecosystems: Mangroves, seagrasses and salt marshes during 2010–2018. *Sensors*, 19(8), 1933.
- Planet. (2020). Planet Imagery Product Specifications. Planet Labs Inc, May, 1–100.
https://www.planet.com/products/satelliteimagery/files/Planet_Imagery_Product_Specs.pdf
- Planet (2023). *Understanding PlanetScope Instruments*. Retrieved from <https://developers.planet.com/docs/apis/data/sensors/#the-psbsd-instrument>
- Prasetya, J. D., & Purwanti, F. (2017). Mangrove health index as part of sustainable management in mangrove ecosystem at Karimunjawa National Marine Park Indonesia. *Advanced Science Letters*, 23(4), 3277-3282.
- Pratama, B. A. S., Danoedoro, P., & Arjasakusuma, S. (2024). Exploring optimal integration schemes for Sentinel-1 SAR and Sentinel-2 multispectral data in land cover mapping across different atmospheric conditions. *Remote Sensing Applications: Society and Environment*, 34, 101185.
- Prayudha, B., Ulumuddin, Y. I., Siregar, V., Agus, S. B., Prasetyo, L. B., Avianto, P., & Ramadhani, M. R. (2024). Enhanced mangrove index: A spectral index

for discrimination understory, nypa, and mangrove trees. *MethodsX*, 102778.

Probst, P., Wright, M. N., & Boulesteix, A. L. (2019). Hyperparameters and tuning strategies for *Random Forest*. *Wiley Interdisciplinary Reviews: data mining and knowledge discovery*, 9(3), e1301.

Purnamasari, E., Kamal, M., & Wicaksono, P. (2021). Comparison of vegetation indices for estimating above-ground mangrove carbon stocks using PlanetScope image. *Regional Studies in Marine Science*, 44, 101730. <https://doi.org/10.1016/j.rsma.2021.101730>

Pushidrosal. (2018). *Data Kelautan Yang Menjadi Rujukan Nasional Diluncurkan*. Retrieved from <https://www.pushidrosal.id/berita/5256/Data-Kelautan-yang-Menjadi-Rujukan-Nasional--Diluncurkan/>

Rahees, N., Kiran, M., & Vishal, V. (2014). Phytosociological analysis of mangrove forest at Kadalundi-Vallikkunnu community reserve, Kerala. *Inter J Sci Tech*, 3, 2154-2159.

Rahim, S., & Baderan, D. (2017). *Hutan Mangrove dan Pemanfaatannya*. Yogyakarta: CV Budi Utama.

Rahmandhana, A. D., Kamal, M., Wicaksono, P. (2022). Spectral Reflectance-Based Mangrove Species Mapping from WorldView-2 Imagery of Karimunjawa and Kemujan Island, Central Java Province, Indonesia. *Remote Sensing*; 14(1):183. <https://doi.org/10.3390/rs14010183>.

Rouse, J. W., Haas, R. H., Schell, J. A., & Deering, D. W. (1974). Monitoring vegetation systems in the Great Plains with ERTS. *Third Earth Resources Technology Satellite-1 Symposium*, 1, 309–317. <https://doi.org/10.1021/jf60203a024>

Saenger, P. (2002). *Mangrove Ecology, Silviculture and Conservation*. In *Mangrove Ecology, Silviculture and Conservation*. <https://doi.org/10.1007/978-94-015-9962-7>.

- Samuel, A. L. (1959). Some studies in machine learning using the game of checkers. *IBM Journal of research and development*, 3(3), 210-229.
- Shi, T., Liu, J., Hu, Z., Liu, H., Wang, J., & Wu, G. (2016). New spectral metrics for mangrove forest identification. *Remote Sensing Letters*, 7(9), 885-894.
- Sidik, F., Supriyanto, B., Krisnawati, H., & Muttaqin, M. Z. (2018). Mangrove conservation for climate change mitigation in Indonesia. *Wiley Interdisciplinary Reviews: Climate Change*, 9(5), e529. <https://doi.org/10.1002/wcc.529>.
- Son, H. T., Hoa, N. H., & Van Truong, V. (2023). Mangrove Cover-Based Vegetation Indices Mapping Using Planetscope Data in Tien Yen District Quang Ninh Province. *Journal of Forestry Science and Technology*, 15, 127-138.
- Spalding, M. (2010). *World atlas of mangroves*. Routledge.
- Specht, RL (1970) Vegetation. In: *The Australian Environment*, 4th ed (G.W. Leeper, ed.), pp 44–67. CSIRO-Melbourne University Press, Melbourne, Victoria
- Srikanth, S., Lum, S. K. Y., & Chen, Z. (2016). Mangrove root: adaptations and ecological importance. *Trees*, 30, 451-465.
- Sun, D., Wen, H., Wang, D., & Xu, J. (2020). A *Random Forest* model of landslide susceptibility mapping based on hyperparameter optimization using Bayes algorithm. *Geomorphology*, 362, 107201.
- Suyarso, & Avianto, P. (2022). AMMI automatic mangrove map and index: novelty for efficiently monitoring mangrove changes with the case study in musi delta, South Sumatra, Indonesia. *International Journal of Forestry Research*, 2022(1), 8103242.
- Thom, B. G. (1984). Transgressive and regressive stratigraphies of coastal sand barriers in southeast Australia. *Marine Geology*, 56(1-4), 137-158.

- Thomas, N., Lucas, R., Bunting, P., Hardy, A., Rosenqvist, A., & Simard, M. (2017). Distribution and drivers of global mangrove forest change, 1996–2010. *PLoS ONE* 12(6): e0179302. <https://doi.org/10.1371/journal.pone.0179302>
- Tomlinson, P. B. (2016). *The botany of mangroves*. Cambridge University Press.
- Tucker, C. J. (1980). A spectral method for determining the percentage of green herbage material in clipped samples. *Remote Sensing of Environment*, 9(2), 175–181. [https://doi.org/10.1016/0034-4257\(80\)90007-3](https://doi.org/10.1016/0034-4257(80)90007-3).
- Umarhadi, D. A., & Danoedoro, P. (2021). Comparing canopy density measurement from UAV and hemispherical photography: an evaluation for medium resolution of remote sensing-based mapping. *International Journal of Electrical and Computer Engineering (IJECE)*, 11(1), 356-364.
- Vaiphasa, C., Skidmore, A. K., & de Boer, W. F. (2006). A post-classifier for mangrove mapping using ecological data. *ISPRS Journal of Photogrammetry and Remote Sensing*, 61(1), 1-10.
- Wang, L., Jia, M., Yin, D., & Tian, J. (2019). A review of remote sensing for mangrove forests: 1956–2018. *Remote Sensing of Environment*, 231 (May). <https://doi.org/10.1016/j.rse.2019.111223>.
- Wang, L., Sousa, W. P., & Gong, P. (2004a). Integration of object-based and pixel-based classification for mapping mangroves with IKONOS imagery. *International journal of remote sensing*, 25(24), 5655-5668.
- Wang, L., Sousa, W. P., Gong, P., & Biging, G. S. (2004b). Comparison of IKONOS and QuickBird images for mapping mangrove species on the Caribbean coast of Panama. *Remote sensing of environment*, 91(3-4), 432-440.
- Wang, T., Zhang, H., Lin, H., & Fang, C. (2015). Textural–spectral feature-based species classification of mangroves in Mai Po Nature Reserve from Worldview-3 imagery. *Remote Sensing*, 8(1), 24.

- Watanakij, N., & Vaiphasa, C. (2016). Improving the Accuracy of Mangrove Species Discrimination using Object Based and High Spatial Resolution Imagery: A Case Study in Pak Phanang, Thailand. *International Journal of Geoinformatics*.
- Wei, Y., Cheng, Y., Yin, X., Xu, Q., Ke, J., & Li, X. (2023). Deep learning-based classification of high-resolution satellite images for mangrove mapping. *Applied Sciences*, 13(14), 8526.
- Wicaksono, P., Danoedoro, P., Hartono, H., Nehren, U., & Ribbe, L. (2011, October). Preliminary work of mangrove ecosystem carbon stock mapping in small island using remote sensing: above and below ground carbon stock mapping on medium resolution satellite image. In *Remote Sensing for Agriculture, Ecosystems, and Hydrology XIII* (Vol. 8174, pp. 408-417). SPIE.
- Wicaksono, P., Danoedoro, P., Hartono, & Nehren, U. (2016). Mangrove biomass carbon stock mapping of the Karimunjawa Islands using multispectral remote sensing. *International journal of remote sensing*, 37(1), 26-52.
- Wijaya, M. S., Kamal, M., & Widayani, P. (2023). Mapping of Mangrove Composition in Ratai Bay, Lampung Province using Pleiades 1 Satellite Imagery. *Jurnal Geografi Gea*, 23(2), 107-122.
- Winarso, G., Purwanto, A. D., & Yuwono, D. (2014, November). New mangrove index as degradation/health indicator using Remote Sensing data: Segara Anakan and Alas Purwo case study. In *12th Biennial Conference of Pan Ocean Remote Sensing Conference* (pp. 309-316).
- Wirasatriya, A., Pribadi, R., Iryanthony, S. B., Maslukah, L., Sugianto, D. N., Helmi, M., ... & Nadaoka, K. (2022). Mangrove above-ground biomass and carbon stock in the Karimunjawa-Kemuja Islands estimated from unmanned aerial vehicle-imagery. *Sustainability*, 14(2), 706.
- Xu, Y., Zhou, Y., Sekula, P., & Ding, L. (2021). Machine learning in construction: From shallow to deep learning. *Developments in the built environment*, 6, 100045.

- Xu, C., Wang, J., Sang, Y., Li, K., Liu, J., & Yang, G. (2023). An effective deep learning model for monitoring mangroves: A case study of the Indus Delta. *Remote Sensing*, 15(9), 2220.
- Yang, L., & Shami, A. (2020). On hyperparameter optimization of machine learning algorithms: Theory and practice. *Neurocomputing*, 415, 295-316.
- Yu, T., & Zhu, H. (2020). Hyper-parameter optimization: A review of algorithms and applications. *arXiv preprint arXiv:2003.05689*.
- Zhang, Y., Fu, K., Sun, H., Sun, X., Zheng, X. W., & Wang, H. (2018). "A Multi-Model Ensemble Method Based on Convolutional Neural Networks for Aircraft Detection in Large Remote Sensing Images." *Remote Sensing Letters* 9 (1): 11–20. Taylor & Francis. doi:10.1080/2150704X.2017.1378452.
- Zhou Z. H., Feng J., (2017). Deep forest: towards an alternative to deep neural networks. In: *Proceedings of the 26th International Joint Conference on Artificial Intelligence*, Melbourne, Australia, 3553–9. <https://doi.org/10.48550/arXiv.1702.08835>.
- Zhou, Z. H., & Feng, J. (2019). *Deep Forest*. *National science review*, 6(1), 74-86