

REFERENCES

REFERENCES

- Arthey, T., Srisompun, O., and Zimmer, Y. (2018). Report to FAO Cassava Production and Processing in Thailand.
- Arthur, D., and Vassilvitskii, S. (2006). k-means++: The advantages of careful seeding.
- Bah, M. D., Hafiane, A., and Canals, R. (2018). Deep Learning with Unsupervised Data Labeling for Weed Detection in Line Crops in UAV Images. *Remote Sensing*, 10(11), 1690.
- Bankhead, P. (2022). Filters. In Introduction to Bioimage Analysis. Retrieved from <https://bioimagebook.github.io/chapters/2-processing/4-filters/filters.html>.
- Bansod, B., Singh, R., Thakur, R., and Singhal, G. (2017). A comparison between satellite based and drone based remote sensing technology to achieve sustainable development: A review. *Journal of Agriculture and Environment for International Development*, 111, 383-407. doi:10.12895/jaeid.20172.690.
- Boonrang, A., Sritarapipat, T., and Piyatadsananon, P. (2021, November). Applicable Mean-Shift Filtering Parameters for Mapping Weed in Cassava Fields based on UAV Images. Proceeding of the 42nd Asian Conference on Remote Sensing (ACRS2021), Can Tho University, Can Tho city, Vietnam. Retrieved from https://a-a-r-s.org/proceeding/ACRS2021/2%20Algorithm%20and%20Image%20Processing/ACRS21_146.pdf.
- Candiago, S., Remondino, F., De Giglio, M., Dubbini, M., and Gattelli, M. (2015). Evaluating Multispectral Images and Vegetation Indices for Precision Farming Applications from UAV Images. *Remote Sensing*, 7(4). doi:10.3390/rs70404026.
- Chaudhary, P., Chaudhari, A., and Godara, S. (2012). Color Transform Based Approach for Disease Spot Detection on Plant Leaf. *International Journal of Computer Science and Telecommunications*, 3, 65-71.
- Chiranan, P., Anan, P., and Arunee, P. (2014). Effects of planting methods and weed control measures on growth and yield of dry-direct seeded rice under rainfed conditions. *Khon Kaen agriculture Journal*, 42, 411-416.

- Collins, R. T. (2003). Mean-shift blob tracking through scale space. Proceedings of the 2003 IEEE Computer Society Conference on Computer Vision and Pattern Recognition. Madison, WI, USA. doi: 10.1109/CVPR.2003.1211475.
- Comaniciu, D., and Meer, P. (1999, September). Mean shift analysis and applications. Proceedings of the Seventh IEEE International Conference on Computer Vision, Kerkyra, Greece, 1999, 1197-1203 vol.2, doi: 10.1109/ICCV.1999.790416.
- Comaniciu, D., and Meer, P. (2002). Mean shift: A robust approach toward feature space analysis. *IEEE Transactions on pattern analysis and machine intelligence*, 24(5), 603-619.
- De Castro, A. I., Torres-Sánchez, J., Peña, J. M., Jiménez-Brenes, F. M., Csillik, O., and López-Granados, F. (2018). An Automatic Random Forest-OBIA Algorithm for Early Weed Mapping between and within Crop Rows Using UAV Imagery. *Remote Sensing*, 10(2). doi:10.3390/rs10020285.
- Ekanayake, I., Osiru, D., and Porto, M. (1997). Agronomy of cassava: IITA research guide, No. 60. International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria.
- Escadafal, R., and Huete, A. (1991). Improvement in remote sensing of low vegetation cover in arid regions by correcting vegetation indices for soil 'noise'. *Comptes Rendus - Academie des Sciences, Serie II*, 312(11), 1385-1391.
- FAO. (2009). How to Feed the World in 2050 (High-Level Expert Forum, 2009). Retrieved from https://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF_2050_Global_Agriculture.pdf.
- FAOSTAT Statistical Database. (2022). Crops and livestock products. Retrieved 20/12/2022, from [Rome]: FAO.
- Foody, G. M., and Mathur, A. (2004). Toward intelligent training of supervised image classifications: directing training data acquisition for SVM classification. *Remote Sensing of Environment*, 93(1), 107-117. <https://doi.org/10.1016/j.rse.2004.06.017>.
- Fried, G., Chauvel, B., Reynaud, P., and Sache, I. (2017). Decreases in Crop Production by Non-native Weeds, Pests, and Pathogens. In M. Vilà and P. E. Hulme (Eds.),

- Impact of Biological Invasions on Ecosystem Services*, 12, 83-101. Springer, Cham. https://doi.org/10.1007/978-3-319-45121-3_6.
- Fukunaga, K., and Hostetler, L. (1975). The estimation of the gradient of a density function, with applications in pattern recognition. *IEEE Transactions on Information Theory*, 21(1), 32-40. doi:10.1109/TIT.1975.1055330.
- Gao, J., Liao, W., Nuytens, D., Lootens, P., Vangeyte, J., Pižurica, A., . . . Pieters, J. G. (2018). Fusion of pixel and object-based features for weed mapping using unmanned aerial vehicle imagery. *International Journal of Applied Earth Observation and Geoinformation*, 67, 43-53. <https://doi.org/10.1016/j.jag.2017.12.012>.
- Gareth, J., Daniela, W., Trevor, H., and Robert, T. (2015). An introduction to statistical learning: with applications in R: Springer.
- Gašparović, M., Zrinjski, M., Barković, Đ., and Radočaj, D. (2020). An automatic method for weed mapping in oat fields based on UAV imagery. *Computers and Electronics in Agriculture*, 173, 105385. <https://doi.org/10.1016/j.compag.2020.105385>.
- Gates, D. M., Keegan, H. J., Schleiter, J. C., and Weidner, V. R. (1965). *Spectral Properties of Plants*. *Applied Optics*, 4(1), 11-20. doi:10.1364/AO.4.000011.
- Ge, Y., Bai, H., Wang, J., and Cao, F. (2012). Assessing the quality of training data in the supervised classification of remotely sensed imagery: a correlation analysis. *Journal of Spatial Science*, 57(2), 135-152. doi:10.1080/14498596.2012.733616.
- Gitelson, A. A., Kaufman, Y. J., Stark, R., and Rundquist, D. (2002). Novel algorithms for remote estimation of vegetation fraction. *Remote Sensing of Environment*, 80(1), 76-87. [https://doi.org/10.1016/S0034-4257\(01\)00289-9](https://doi.org/10.1016/S0034-4257(01)00289-9).
- Grenier, T., Revol-Muller, C., and Gimenez, G. (2006, October). Hybrid approach for multiparametric mean shift filtering. Proceedings of the 2006 International Conference on Image Processing. Atlanta, GA, USA, 2006. 1541-1544, doi: 10.1109/ICIP.2006.312644.

- Guijarro, M., Pajares, G., Riomoros, I., Herrera, P. J., Burgos-Artizzu, X. P., and Ribeiro, A. (2011). Automatic segmentation of relevant textures in agricultural images. *Computers and Electronics in Agriculture*, 75(1), 75-83. doi: 10.1016/j.compag.2010.09.013.
- Hall, O., Dahlin, S., Marstorp, H., Archila Bustos, M. F., Öborn, I., and Jirström, M. (2018). Classification of Maize in Complex Smallholder Farming Systems Using UAV Imagery. *Drones*, 2(3), 22. <https://doi.org/10.3390/drones2030022>.
- Hamuda, E., Glavin, M., and Jones, E. (2016). A survey of image processing techniques for plant extraction and segmentation in the field. *Computers and Electronics in Agriculture*, 125, 184-199. <https://doi.org/10.1016/j.compag.2016.04.024>.
- Howeler, R., Lutaladio, N., and Thomas, G. (2013). *Save and Grow: Cassava. A guide to sustainable production intensification*. Rome, Italy: FAO.
- Huang, H., Deng, J., Lan, Y., Yang, A., Deng, X., and Zhang, L. (2018). A fully convolutional network for weed mapping of unmanned aerial vehicle (UAV) imagery. *PLOS ONE*, 13(4), e0196302. doi:10.1371/journal.pone.0196302.
- Huang, H., Li, X., and Chen, C. (2018). Individual Tree Crown Detection and Delineation From Very-High-Resolution UAV Images Based on Bias Field and Marker-Controlled Watershed Segmentation Algorithms. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 11(7), 2253-2262. doi:10.1109/JSTARS.2018.2830410.
- Ishida, T., Kurihara, J., Viray, F. A., Namuco, S. B., Paringit, E. C., Perez, G. J., . . . Marciano, J. J. (2018). A novel approach for vegetation classification using UAV-based hyperspectral imaging. *Computers and Electronics in Agriculture*, 144, 80-85. <https://doi.org/10.1016/j.compag.2017.11.027>.
- James B. Campbell, and Wynne, R. H. (2011). *Introduction to Remote Sensing: Fifth Edition*. New York: The Guilford Press.
- Jeamjamnanja, J., Phuddacharoen, S., Pulsa-nguan, P., Rojanaridpiched, C., and Saengkaewsuk, W. (1984). Timing of weed control in cassava. 2(3), 144-147.

- Jinru, X., and Su, B. (2017). Significant Remote Sensing Vegetation Indices: A Review of Developments and Applications. *Journal of Sensors*, 2017, 1353691. <https://doi.org/10.1155/2017/1353691>.
- Kaur, D., and Kaur, Y. (2014). Various image segmentation techniques: a review. *International Journal of Computer Science and Mobile Computing*, 3(5), 809-814.
- Khan, S., Tufail, M., Khan, M. T., Khan, Z. A., Iqbal, J., and Alam, M. (2021). A novel semi-supervised framework for UAV based crop/weed classification. *PLOS ONE*, 16(5), e0251008. doi:10.1371/journal.pone.0251008.
- Khattak, A., Raja, G., Anjum, N., and Qasim, M. (2015, December). Integration of Mean-Shift and Particle Filter: A Survey. Proceedings of the 2014 12th International Conference on Frontiers of Information Technology, Islamabad, Pakistan, 2014, 286-291. doi:10.1109/FIT.2014.60.
- Kuruvilla, J., Sukumaran, D., Sankar, A., and Joy, S. P. (2016, March). A review on image processing and image segmentation. Proceedings of the 2016 International Conference on Data Mining and Advanced Computing (SAPIENCE), Ernakulam, India, 2016, 198-203, doi: 10.1109/SAPIENCE.2016.7684170.
- Lameski, P., Zdravevski, E., Trajkovik, V., and Kulakov, A. (2017). Weed Detection Dataset with RGB Images Taken Under Variable Light Conditions. *Communications in Computer and Information Science*, 778, 112-119. https://doi.org/10.1007/978-3-319-67597-8_11.
- Li, T. (2012). Contributions to Mean Shift filtering and segmentation: Application to MRI ischemic data. INSA de Lyon.
- LÓPez-Granados, F. (2011). Weed detection for site-specific weed management: mapping and real-time approaches. *Weed Research*, 51(1), 1-11. <https://doi.org/10.1111/j.1365-3180.2010.00829.x>.
- Lottes, P., Khanna, R., Pfeifer, J., Siegwart, R., and Stachniss, C. (2017, 29 May-3 June 2017). UAV-based crop and weed classification for smart farming. Proceeding of

- the 2017 IEEE International Conference on Robotics and Automation (ICRA). Singapore, 2017, 3024-3031. doi: 10.1109/ICRA.2017.7989347.
- Louargant, M., Villette, S., Jones, G., Vigneau, N., Paoli, J. N., and Gée, C. (2017). Weed detection by UAV: simulation of the impact of spectral mixing in multispectral images. *Precision Agriculture*, 18, 1-20. doi:10.1007/s11119-017-9528-3.
- Louargant, M., Jones, G., Faroux, R., Paoli, J.-N., Maillot, T., Gée, C., and Villette, S. (2018). Unsupervised Classification Algorithm for Early Weed Detection in Row-Crops by Combining Spatial and Spectral Information. *Remote Sensing*, 10(5), 761.
- Louhaichi, M., Borman, M. M., and Johnson, D. E. (2001). Spatially Located Platform and Aerial Photography for Documentation of Grazing Impacts on Wheat. *Geocarto International*, 16(1), 65-70. doi:10.1080/10106040108542184.
- Lueang-a-papong, P. (1998). Effect of Certain Weed Managements on Yield of Corn (*Zea mays*). *Journal of Agriculture*, 14(2), 134-141. Retrieved from <https://li01.tci-thaijo.org/index.php/joacmu/article/download/247303/169167>.
- Marin-Morales, M. A., Ventura-Camargo, B. d. C., and Hoshina, M. M. (2013). Toxicity of Herbicides: Impact on Aquatic and Soil Biota and Human Health. InTech. doi: 10.5772/55851.
- Mathieu, R., Pouget, M., Cervelle, B., and Escadafal, R. (1998). Relationships between Satellite-Based Radiometric Indices Simulated Using Laboratory Reflectance Data and Typic Soil Color of an Arid Environment. *Remote Sensing of Environment*, 66(1), 17-28. [https://doi.org/10.1016/S0034-4257\(98\)00030-3](https://doi.org/10.1016/S0034-4257(98)00030-3).
- McGeeney, R. (2022). 'This is a year to survive': High input costs, weed pressure top concerns for growers gearing up for 2022. Retrieved from <https://www.uaex.uada.edu/media-resources/news/2022/01-28-2022-ark-hazen-herbicides.aspx>.
- Meyer, G., Hindman, T., and Laksmi, K. (1999, January). Machine vision detection parameters for plant species identification. Proceeding of the Precision Agriculture and Biological Quality. <https://doi.org/10.1117/12.336896>.

- Meyer, G. E., and Neto, J. C. (2008). Verification of color vegetation indices for automated crop imaging applications. *Computers and Electronics in Agriculture*, 63(2), 282-293. <https://doi.org/10.1016/j.compag.2008.03.009>.
- Miller, P. C. (2003). Patch spraying: future role of electronics in limiting pesticide use. *Pest Manag Sci*, 59(5), 566-574. doi:10.1002/ps.653.
- Morales, R., Torres, E., and Sossa, H. (2011). Image segmentation based on an iterative computation of the mean shift filtering for different values of window sizes. *International Journal of Imaging and Robotics*, 6(A11), 1-19.
- Mulla, D. J. (2013). Twenty five years of remote sensing in precision agriculture: Key advances and remaining knowledge gaps. *Biosystems Engineering*, 114(4), 358-371. <https://doi.org/10.1016/j.biosystemseng.2012.08.009>.
- Narkhede, H. (2013). Review of image segmentation techniques. *International Journal of Science and Modern Engineering*, 1(8), 54-61.
- OAE. (2022). Data of Agriculture production (in Thai). Retrieved from www.oae.go.th.
- Oerke, E. C. (2006). Crop losses to pests. *The Journal of Agricultural Science*, 144(1), 31-43. doi:10.1017/S0021859605005708.
- Office of Agricultural Economics. (2019). Agricultural Utilized Areas by Province, Year 2019 (In Thai). Retrieved from <https://www.oae.go.th/assets/portals/1/files/socio/LandUtilization2562.pdf>.
- Office of Agricultural Economics. (2021). Export-import of agricultural products (In Thai). Retrieved from <http://mis-app.oae.go.th/>.
- Office of Agricultural Economics. (2023, 16 February 2023). Quantity and Value of Imported Pesticides in 2018 - 2022 (In Thai). Retrieved from <https://www.oae.go.th/view/1/ปัจจัยการผลิต/TH-TH#>.
- Onochie, B. E. (1975). Critical Periods for Weed Control in Cassava in Nigeria. *PANS Pest Articles & News Summaries*, 21(1), 54-57. doi:10.1080/09670877509411488.
- Pajares, G., Ruz, J. J., and de la Cruz, J. M. (2005). Performance Analysis of Homomorphic Systems for Image Change Detection. In: Marques, J.S., Pérez de la Blanca, N., Pina, P. (eds) *Pattern Recognition and Image Analysis. Lecture Notes in*

- Computer Science, 3522. Springer, Berlin, Heidelberg. https://doi.org/10.1007/11492429_68.
- Pantazi, X. E., Tamouridou, A. A., Alexandridis, T. K., Lagopodi, A. L., Kashefi, J., and Moshou, D. (2017). Evaluation of hierarchical self-organising maps for weed mapping using UAS multispectral imagery. *Computers and Electronics in Agriculture*, 139, 224-230. <https://doi.org/10.1016/j.compag.2017.05.026>.
- Pedregosa, F., Varoquaux, G., Gramfort, A., Michel, V., Thirion, B., Grisel, O., . . . Dubourg, V. (2011). Scikit-learn: Machine learning in Python. *the Journal of machine Learning research*, 12, 2825-2830. Retrieved from <https://scikit-learn.org/stable/modules/generated/sklearn.cluster.KMeans.html>.
- Peña, J. M., Torres-Sánchez, J., de Castro, A. I., Kelly, M., and López-Granados, F. (2013). Weed Mapping in Early-Season Maize Fields Using Object-Based Analysis of Unmanned Aerial Vehicle (UAV) Images. *PLOS ONE*, 8(10), e77151. doi:10.1371/journal.pone.0077151.
- Plant protection research and development office. (2016). Integrated Pest Management Guide for Cassava (In Thai). Bangkok, Thailand.
- Polthane, A. (2018). Cassava as an insurance crop in a changing climate: The changing role and potential applications of cassava for smallholder farmers in Northeastern Thailand. *Forest and Society*, 2, 121. doi:10.24259/fs.v2i2.4275.
- Raja, S. K., Abdul Khadir, A. S., and Ahamed, S. R. (2009). Moving Toward Region-based Image Segmentation Techniques: A Study. *Journal of Theoretical & Applied Information Technology*, 5(1), 81-87. Retrieved from https://www.researchgate.net/profile/Kasmir-S-v/publication/255610876_MOVING_TOWARD_REGION-BASED_IMAGE_SEGMENTATION_TECHNIQUES_A_STUDY/links/59157ae40f7e9b70f49c7a17/MOVING-TOWARD-REGION-BASED-IMAGE-SEGMENTATION-TECHNIQUES-A-STUDY.pdf.
- Rodríguez, R., Suarez, A. G., and Sossa, J. H. (2011). A segmentation algorithm based on an iterative computation of the mean shift filtering. *Journal of Intelligent & Robotic Systems*, 63(3), 447-463.

- Saha, D. (2019). Development of Enhanced Weed Detection System with Adaptive Thresholding, K-Means and Support Vector Machine. Electronic Theses and Dissertations. 3374. <https://openprairie.sdstate.edu/etd/3374>.
- Smith, R. B. (2012). Hyperspectral Imaging. Plant Spectra. Retrieved from <https://microimages.com/documentation/Tutorials/hyprspec.pdf>.
- Song, N., Gu, L., Cao, Z., and Viberg, M. (2006). Enhanced spatial-range mean shift color image segmentation by using convergence frequency and position. Proceeding of the 2006 14th European Signal Processing Conference, Florence, Italy, 2006, 1-5.
- Su, J., Yi, D., Coombes, M., Liu, C., Zhai, X., McDonald-Maier, K., and Chen, W.-H. (2022). Spectral analysis and mapping of blackgrass weed by leveraging machine learning and UAV multispectral imagery. *Computers and Electronics in Agriculture*, 192, 106621. <https://doi.org/10.1016/j.compag.2021.106621>.
- Subeesh, A., Bhole, S., Singh, K., Chandel, N. S., Rajwade, Y. A., Rao, K. V. R., . . . Jat, D. (2022). Deep convolutional neural network models for weed detection in polyhouse grown bell peppers. *Artificial Intelligence in Agriculture*. 6, 47-54. <https://doi.org/10.1016/j.aiia.2022.01.002>.
- Tawatsin, A. (2015). Pesticides used in Thailand and toxic effects to human health. *Medical Research Archives*. (3). Retrieved from <https://esmed.org/MRA/mra/article/view/176>.
- Tian, X., Hsiao-Chun, W., and Huang, S. C. H. (2014). A new stopping criterion for fast low-density parity-check decoders. *IEEE Communications Letters*, 18(10), 1679-1682. doi: 10.1109/LCOMM.2014.2349988.
- Tsouros, D. C., Bibi, S., and Sarigiannidis, P. G. (2019). A Review on UAV-Based Applications for Precision Agriculture. *Information*, 10(11), 349. Retrieved from <https://www.mdpi.com/2078-2489/10/11/349>.
- Tucker, C. J. (1979). Red and photographic infrared linear combinations for monitoring vegetation. *Remote Sensing of Environment*, 8(2), 127-150. [https://doi.org/10.1016/0034-4257\(79\)90013-0](https://doi.org/10.1016/0034-4257(79)90013-0).

- van Dijk, M., Morley, T., Rau, M. L., and Saghai, Y. (2021). A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050. *Nature Food*, 2(7), 494-501. doi:10.1038/s43016-021-00322-9.
- Virtanen, O., Constantinidou, E., and Tyystjärvi, E. (2022). Chlorophyll does not reflect green light – how to correct a misconception. *Journal of Biological Education*, 56(5), 552-559. doi:10.1080/00219266.2020.1858930.
- Vityakon, P., and Prachaiyo, B. (1992, March). The role of trees in the rice paddies of the Northeast in the sustainability of the rain-fed agro-ecology and development as a resource for the community (In Thai). Proceeding of the 9th Thailand National Farming Systems Seminar, Phuket Merlin Hotel, Phuket, Thailand.
- Weston.pace. (2007). k-means clustering. Retrieved from https://en.wikipedia.org/wiki/K-means_clustering.
- Woebbecke, D., Meyer, G., Bargaen, K., and Mortensen, D. (1995). Color Indices for Weed Identification Under Various Soil, Residue, and Lighting Conditions. *Transactions of the ASAE*, 38, 259-269. doi:10.13031/2013.27838.
- Woolley, J. T. (1971). Reflectance and Transmittance of Light by Leaves. *Plant Physiology*, 47(5), 656-662. doi:10.1104/pp.47.5.656.
- Wydra, K., and Verdier, V. (2002). Occurrence of cassava diseases in relation to environmental, agronomic and plant characteristics. *Agriculture, Ecosystems & Environment*, 93(1), 211-226. [https://doi.org/10.1016/S0167-8809\(01\)00349-8](https://doi.org/10.1016/S0167-8809(01)00349-8).
- Xiang, G. (2009, 17-19 Oct. 2009). Real-Time Follow-Up Tracking Fast Moving Object with an Active Camera. Proceeding of the 2009 2nd International Congress on Image and Signal Processing. Tianjin, China. doi: 10.1109/CISP.2009.5303457.
- Zakaluk, R., Sri Ranjan, R., And, S., and Ranjan. (2008). Predicting the leaf water potential of potato plants using RGB reflectance. Canadian Biosystems Engineering / Le Genie des biosystems au Canada, 50. Retrieved from <https://library.csbe-scgab.ca/docs/journal/50/c0712.pdf>.

- Zhang, S., Guo, J., and Wang, Z. (2019). Combing K-means Clustering and Local Weighted Maximum Discriminant Projections for Weed Species Recognition. *Frontiers in Computer Science*, 1. doi:10.3389/fcomp.2019.00004.
- Zhou, H., Wang, X., and Schaefer, G. (2011). Mean Shift and Its Application in Image Segmentation. In H. Kwaśnicka and L. C. Jain (Eds.), *Innovations in Intelligent Image Analysis*. Berlin, Heidelberg: Springer Berlin Heidelberg.