

A Comparative Study of Multiclass Classification Using the Different Machine Learning Techniques for Fruit Species Prediction from Images

Rugved Korde¹, Achal Sultane², Vedant Mahitkar³, Shreyal Ikhar⁴, Achal Mokhale⁵,
Prof. S. N. Sawalkar⁶

U.G Students, Department of Computer Science and Engineering^{1,2,3,4,5}

Professor, Department of Computer Science and Engineering⁶

SIPNA College of Engineering and Technology, Amravati, Maharashtra, India

Abstract: Fruits play a vital role in our healthy life and are also used for the treatment of various diseases. It also contains an enormous quantity of fibers. It is the application of machine learning that we are using in the fruit classification model. Here we have different fruit images and we have to classify them using multiple algorithms. We are using various algorithms like KNN, random forest, Naive Bayes algorithms, etc. When we are using these algorithms we need our data in numbers or we can say in the numeric format, so we have to convert our fruit image data into a numeric format, and then by applying the various algorithms we can perform the task of classification. In this paper, a machine learning-based approach is presented for classifying and identifying different fruits with a dataset that contains various images. Some images are for training and some images are for validation and for testing. Here we have to take note of one thing while we are dealing with the machine learning and deep learning task or any project we want our data in numeric format. Here we are importing various types of libraries. Food security is a very important topic of discussion in today's society, as improper handling and management of food during production, processing, or distribution have caused increased food wastage around the globe. In addition, it has become clear from statistics gotten from surveys by institutions around the world like the Food Bureau of the United States that it is necessary to increase our rate of food production to meet the needs of our rapidly growing population.

Keywords: Machine Learning

REFERENCES

- [1] A. Nosseir and S. E. Ashraf Ahmed, "Automatic classification for fruits' types and identification of rotten ones using k-NN and SVM," *Int. J. online Biomed. Eng.*, vol. 15, no. 3, pp. 47–61, 2019, doi: 10.3991/ijoe.v15i03.9832.
- [2] S. K. Behera, A. K. Rath, A. Mahapatra, and P. K. Sethy, "Identification, classification & grading of fruits using machine learning & computer intelligence: a review," *J. Ambient Intell. Humaniz. Comput.*, no. Kondo 2010, 2020, doi: 10.1007/s12652-020-01865-8.
- [3] C. C. Patel and V. K. Chaudhari, *Comparative Analysis of Fruit Categorization Using Different Classifiers*. Springer Singapore.
- [4] S. Sakib and Z. Ashrafi, "Implementation of Fruits Recognition Classifier using Convolutional Neural Network Algorithm for Observation of Accuracies for Various Hidden Layers," pp. 8–11, 1980.
- [5] H. M. Zawbaa, M. Hazman, M. Abbass, and A. E. Hassanien, "Automatic fruit classification using random forest algorithm," pp. 164–168, 2014. *Journal of University of Shanghai for Science and Technology* ISSN: 1007-6735 Volume 22, Issue 12, December - 2020 Page-1354
- [6] A. Rocha, D. C. Hauagge, J. Wainer, and S. Goldenstein, "Automatic fruit and vegetable classification from images," vol. 70, pp. 96–104, 2010, doi: 10.1016/j.compag.2009.09.002.
- [7] S. P. Deenan and J. Satheeshkumar, "A Study on Image Processing Methods for Fruit Classification A Study on Image Processing Methods for Fruit," no. December 2012, 2016.

[8] "RECOGNITION ALGORITHMS FOR DETECTION OF APPLE FRUIT IN AN ORCHARD FOR EARLY YIELD PREDICTION "Rong Zhou .

[9] C. PI, DEFECT IDENTIFICATION IN THE FRUIT APPLE USING K-MEANS COLOR IMAGE SEGMENTATION ALGORITHM," no. August 2017, 2019, doi: 10.26483/ijarcs.v8i8.4735.

[10] J. P. Mercol, J. Gambini, and J. M. Santos, "Automatic classification of oranges using image processing and data mining techniques," XIV Congr. Argentino Ciencias la Comput. XIV Argentine Congr. Comput. Sci. (CACIC 2008), pp. 1–12, 2008.