

ABSTRACT

APPLICATION OF CONVOLUTIONAL NEURAL NETWORKS IN FOOD IMAGE CLASSIFICATION TO DETERMINE CALORIES

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Every individual needs different energy, it's because of the difference in gender, age, and activity. In Indonesia, the calorie adequacy rate is regulated in the Regulation of the Minister of Health of the Republic of Indonesia No. 28 of 2019 concerning the Recommended Nutritional Adequacy Rate for the Indonesian Society. Energy or calories have a huge impact on the body. The habit of consuming high-calorie foods can increase blood sugar levels in people with type 2 diabetes mellitus. Therefore, it is necessary to monitor calorie intake to suit your needs. Based on these problems, this research will develop a food classification system based on images using the Convolutional Neural Network (CNN) to determine calories with a case study of traditional Yogyakarta food. In its application, 48 models were built with several parameter scenarios, they are the number of convolutional layers, the number of epochs, the number of datasets, and the comparison of the distribution of training data and validation data. Based on the test results, the number of convolutional layers affects the accuracy of the model. the more convolutional layers used, the higher the accuracy obtained. Similar to the previous test, the number of epochs also affects the accuracy of the model. The more epochs used, the higher the accuracy obtained. In addition, the number of datasets used during the training process also affects the accuracy of the model. Where the more datasets used, the higher the accuracy results. However, the test results of the distribution comparison scenario show that the data distribution comparison scenario does not affect the overall model accuracy. This is evidenced by the highest accuracy that can be found in all data sharing scenarios. The model with the highest accuracy in this study is 99%. At the end of this research, a system with flask web was built, which is used as a food classification system to determine the calorie. The system will classify the image of the food, after getting the name of the food, then the system will send it to the database to take the calorie data. The system has been running well, where the results of the classification are in accordance with the calorie content data.

Kata kunci: *accuracy, convolutional layer, CNN, epoch, model*