ABSTRACT

Nutrition are nutrients needed by the body for metabolic processes, energy formation, and body growth. Meeting daily nutritional needs is an important factor so that body health is maintained and metabolic processes in the body run well. However, in fact, almost half of the population in Indonesia has a very low level of energy intake, while 21.8% of adults are obese. Nutritional problems are usually caused by the intake of nutrients that have not met the body's needs or because of the wrong food components, both in terms of quantity and quality. Currently, the process of calculating daily nutrition is still in a conventional way, so we need a system that can detect the image of the food and display the type of food.

This final project research designed a system to detect nutrients in processed food images in real-time using the Convolutional Neural Network (CNN) method with the YOLOv4 detection model based on Android. This system processes input in the form of food images which will then produce output in the form of the name of the type of food and information on nutritional content such as calories, carbohydrates, fat, protein, water, and fiber.

In this study, testing and training processes were carried out on the system using the YOLOv4 algorithm. This system produced an avg loss value of 0.8481 and has a fairly high mean Average Precision (mAP) of 96.6% in the 2800th iteration using 2000 images for training data. Thus, this system can be implemented on the Android operating system with a usability testing value of 91.3%.

Keywords: Nutrition, *Convolutional Neural Network* (CNN), YOLOv4, Android.