

## ABSTRACT

Obesity is a global health problem that continues to increase every year. This condition does not only have an impact on physical health, such as increasing the risk of heart disease, type 2 diabetes and various other chronic diseases. Apart from that, this condition can also affect the sufferer's quality of life psychologically. Early identification of the level of obesity is one of the important steps that can be taken to prevent further impacts caused by this condition. Previous research that carried out classification of obesity levels using the KNN algorithm still faced challenges in terms of accuracy which did not provide the best performance in handling classification of obesity levels. To overcome this problem, this research aims to classify obesity levels based on the Obesity Levels dataset using the Light Gradient Boosting machine (LightGBM) algorithm. This algorithm was chosen because of its ability to handle large data and produce high accuracy. The research process includes data collection, normalization with the min-max scaling method, model training, and evaluation using metrics such as accuracy, precision, and G-Mean. The research results show that LightGBM produces the best accuracy of 98.58% with a G-Mean value of 98.51%, which means that the model is very good at handling majority and minority classes with the best combination of hyperparameters ( $n\_estimators = 200$ ,  $learning\_rate = 0.05$ ) and the proportion of training and test data is 80:20. These findings support the application of LightGBM as an effective algorithm in classifying obesity levels with a significant level of accuracy.

**Keywords** : LightGBM, G-Mean, Klasifikasi Obesitas, Evaluasi Model, Ensemble Learning, Akurasi