ABSTRACT

Classification is an important task in machine learning to find patterns between data and labels. K-Nearest Neighbors (KNN) is an algorithm that is widely used for classification, but its performance is greatly influenced by the K value, namely the number of nearest neighbors used for predictions. This is because KNN classifies data based on the majority of data around it, so different K values produce accuracy. different. To overcome this problem, the Hyperparameter Tuning method is used, which utilizes search algorithms such as Grid Search and Random Search to find the best K value. However, choosing the right Hyperparameter Tuning method is also a determining factor in the success of finding the K value because each method has different characteristics and performance. This research analyzes the comparison of the two methods on the KNN algorithm, evaluated with six datasets based on accuracy, memory usage, and computing time. The results show that Grid Search is better in terms of accuracy, with small differences in the values of accuracy (0.5%), precision (0.67%), recall (0.83%), and F1-score (0.33%). Meanwhile, Random Search is more efficient in memory usage and computing time, with a difference of 3.4 MiB in memory and eight seconds in computing time.

Keywords: *Grid Search, Hyperparameter Tuning, K-Nearest Neighbors, Random Search*