

Abstract

Diabetes is a condition in which blood sugar levels rise so high that the body cannot process these sugar levels. Diabetes is divided into 3 types namely, type 1 diabetes, type 2 diabetes, and gestational diabetes. Type 1 diabetes is characterized by the destruction of autoimmune cells, so that the body does not produce enough insulin. Diabetes is the third largest cause of death in Indonesia with a proportion of 6.7%. Early detection of diabetes will help reduce the high death rate caused by diabetes. With current technological developments, the implementation of machine learning on microarrays can help detect diabetes earlier. In this study, the Cuckoo Search (CS) algorithm was used combined with the Support Vector Machine (SVM) to predict diabetes using microarrays. Hyperparameter Tuning is used in 3 kernels namely RBF, Poly, and Linear to improve the results of the model. We found that the performance of SVM with the RBF kernel got the best results with accuracy values and F1-scores for test data were 0.809 and 0.878 respectively.

Keywords: : *Diabetes type 1, Machine Learning, Microarray, Cuckoo Search, Support Vector Machine*