

ABSTRACT

Delayed diagnosis of liver disease can have a serious impact on the success of treatment. This study aims to develop a classification model using the Support Vector Machine (SVM) algorithm to detect liver disease early. The dataset used includes patient data with various attributes, such as laboratory results and clinical symptoms obtained from the UCI Machine Learning Repository. The research process is carried out using the CRISP-DM methodology which includes the stages of business understanding, data understanding, data preparation, modeling, evaluation, and deployment. Data that has gone through the preprocessing stage is used to build and test SVM models using various types of kernels and oversampling methods. At the initial stage, the best performing model was obtained from the combination of linear kernel and SMOTE+TOMEK technique in the 90:10 data split scenario, which gave an accuracy rate of 64.41%. After optimization through hyperparameter tuning using GridSearch and application of sigmoid kernel with ADASYN method. This method proved to be able to increase the accuracy to 13.56% until it reached an accuracy result of 77.97%. This finding shows that parameter optimization and handling unbalanced class distributions play an important role in improving model performance. To facilitate the data visualization process, a web-based model dashboard was created that presents classification results along with patient data analysis.

Keywords: *liver disease, Support Vector Machine, classification, CRISP-DM*