ABSTRACT

Chronic kidney disease (CKD) is a serious global health issue because it often does not show symptoms in the early stages and can lead to kidney failure. This study aims to develop an early prediction model for chronic kidney disease using three algorithms, namely Random Forest, Support Vector Machine (SVM), and Long Short- Term Memory (LSTM), and implement it in a web-based system using the Flask framework. The CRISP-DM methodology was used in the development stages, which included data exploration, data cleaning, model training, evaluation, and implementation. The dataset used was sourced from UCI with a total of 2C medical features. Performance evaluation was conducted using accuracy, precision, recall, and F1-score metrics. Based on the evaluation results, the Random Forest model showed the best performance with an accuracy of SS.1% in the 70:30 data split scenario. The Flask-based prediction system was designed to make it easier for medical personnel to make predictions without needing to understand the technical aspects of programming. In addition, the system is also equipped with feature contribution visualization using LIME to improve the interpretability of prediction results. This research is expected to provide practical and accurate solutions to support the early detection of chronic kidney disease and contribute to the application of artificial intelligence technology in the field of health.

Keywords: Chronic Kidney Disease, Random Forest, SVM, LSTM, Flask