Comparative Performance Analysis of Machine Learning Algorithms for Early Detection of Heart

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Abstract

Cardiovascular disease is one of the leading causes of death worldwide, and early diagnosis plays a crucial role. In recent years, machine learning algorithms have been effectively used for early detection of heart diseases. This study presents an analysis conducted using the publicly available UCI heart disease dataset to detect heart diseases early and determine individuals' risk levels. The dataset includes 920 patients and 14 clinical features. In this study, the performance of various machine learning algorithms, including SVM, Random Forest, LightGBM, XGBoost, KNN, and Logistic Regression, was evaluated using metrics such as accuracy, AUC, precision, recall, and F1-score. According to the results, the SVM model achieved the highest performance with an accuracy rate of 83.15%. The findings highlight the significant potential of machine learning-based approaches in the early diagnosis of heart disease and determining disease risk.

Keywords: Heart Disease, early Detection, Machine Learning, Support Vector Machine (SVM).

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