

Title: Improving hepatitis C diagnosis using machine learning techniques

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Abstract: Hepatitis C is a major global health problem; the right diagnosis is critical to effective disease management. In recent years, machine learning techniques have shown promise in improving diagnostic accuracy in various medical applications. We aim to improve the diagnosis of hepatitis C by comprehensively analyzing several machine learning algorithms in this study. We compared and evaluated the classification accuracy, precision, and recall of 12 different models, including random forest, gradient boosting, k-nearest neighbors, extreme gradient boost, extra trees, AdaBoost, LogitBoost, CatBoost, support vector machine, naive Bayes, neural network (multilayer perceptrons) and Gaussian process classifiers. Here, we train and test these machine learning models to determine the most effective way to classify hepatitis C diagnoses. We evaluate the algorithm's accuracy and compare our results with existing literature. The highest model accuracy in this study using LogitBoost was 98%, while extra trees achieved 99% accuracy after undersampling the data. This experimental analysis demonstrates the potential of machine learning techniques to improve hepatitis C diagnosis. The high accuracy of the LogitBoost and extra trees models highlights their effectiveness in identifying hepatitis C cases. By harnessing the power of machine learning algorithms, we can improve hepatitis C diagnostics, enabling early detection, timely intervention, and improved patient outcomes. The results of this study have major implications for the medical community and may improve the development of more accurate and effective hepatitis C diagnostic tools.

Keywords: Hepatitis C, Machine learning, Diagnostic accuracy, Classification models

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