

Research on XGBOOST algorithm and application development of a subsystem supporting initial medical classification

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Abstract: This study investigates the application of the XGBoost algorithm to develop a subsystem supporting the initial classification of medical examinations and treatments. The primary objective is to enhance the accuracy and efficiency of patient triage by leveraging machine learning techniques on structured clinical data. The research methodology involved collecting and preprocessing a dataset of patient records, including symptoms, vital signs, and demographic information. The XGBoost model was trained and optimized using hyperparameter tuning, with performance evaluated against baseline classifiers such as logistic regression and random forests. Experimental results demonstrate that the proposed XGBoost-based subsystem achieves superior classification accuracy, precision, and recall, significantly reducing misclassification rates compared to traditional methods. Furthermore, the subsystem exhibits robust generalization capabilities across diverse patient profiles. The findings confirm that XGBoost is highly effective for medical triage tasks, offering a scalable and reliable solution for healthcare facilities. This work contributes to the advancement of intelligent decision-support systems in primary healthcare, with potential for real-world deployment to streamline patient flow and optimize resource allocation.

Keywords: XGBoost, medical examination and treatment classification, decision support, machine learning